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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 3, 2011

Ref. No.: 09HD-112
Author: LD-GH

MEMORANDUM

TO: Ms. Katherine Puana Kealoha, Director
Office of Environmental Quality Control

FROM: William J. Aila, Jr., Interim Chairperson
Board of Land and Natural Resources *W. Aila*

SUBJECT: Finding of No Significant Impact (FONSI) to the Environment for the Issuance of Direct Lease to Mauna Kea Moo, LLC for Dairy Purposes, Niupea-Kaala, Hamakua, Hawaii, Tax Map Key: 3rd/ 4-1-04:33 and Manowaikohau-Kekualele, Hamakua, Hawaii Tax Map Key: 3rd/4-2-07:02.

The Department of Land and Natural Resources, Land Division, has reviewed the comments received during the 30-day public review period and the applicant's responses to these comments for the above referenced environmental assessment. Accordingly, we have determined that this project will not have a significant environmental effect and have issued a FONSI determination. Please publish this notice in your next scheduled publication of the Environmental Notice.

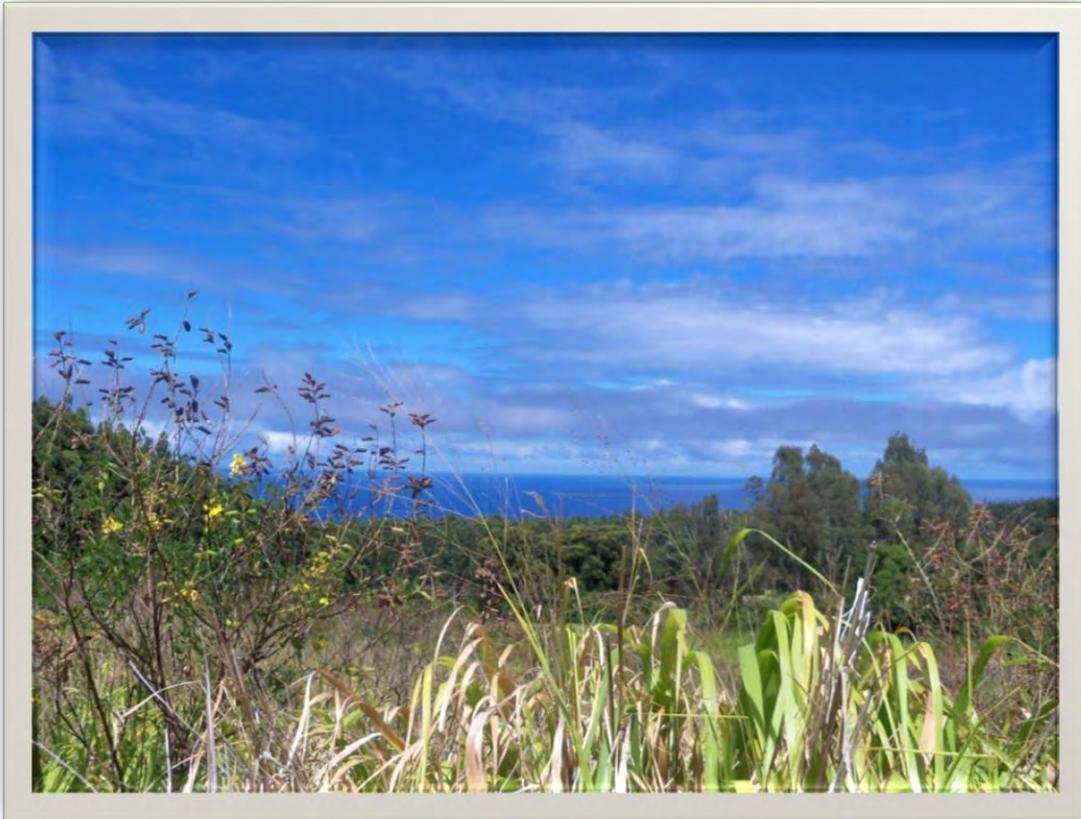
We have enclosed a completed OEQC Bulletin Publication Form and one copy of the draft environmental assessment along with an e-copy of the publication form and draft EA on a compact disc.

If you have any questions, please feel free to contact Gordon Heit at (808) 974-6203. Thank you.

Enclosures

cc: Land Board Member
Central Files
District Files

FINAL
ENVIRONMENTAL ASSESSMENT



TMK 3rd/4-1-04:33 and TMK 3rd/4-2-07:02

PREPARED FOR:

MAUNA KEA MOO, LLC
OOKALA, HAWAII

JANUARY 2011

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SUMMARY

Applicant: Mauna Kea Moo, LLC
P.O. Box 461
Papaikou, HI 96781

Project Location: Hamakua, Hawaii (Figure 1)

(Figure1)



Parcel Identification: Niupea-Kaala, Hamakua, HI Tax Map Keys: 3rd/4-1-04:33 and Manowaikohau-Kekualele, Hamakua HI Tax Map Keys: 3rd/4-2-07:02

Area: Approximately 1,395 Acres

Ownership: State of Hawaii

Existing Use: Abandoned Sugar Cane Land open, vacant land

Proposed Use: 40 year lease for Dairy Farm and Pasturage and Processing Plant for milk. Planting of native fruit and vegetables as well as native trees.

State Land Use District: Agriculture (Figure 2)

(Figure 2)



County Zoning: 40-acre agriculture

Trust Land Status: Section 5(b) lands of the Hawaii Admissions Act
DHHL 30% entitlement lands pursuant to the Hawaii State Constitution:
YES

1.0 Identification of Applicant and Approving Agency

1.1 Identification of Applicant

Mauna Kea Moo, LLC
P.O. Box 461
Papaikou, HI 96781

1.2 Identification of Approving Agency

Department of Land and Natural Resources (DNLR)
Division of Land Management
75 Aupuni Street, Room 204
Hilo, Hawaii 96720



2.0 List of Agencies, Organizations and Individuals Consulted

- Federal:** Natural Resource Conservation Service (NRCS)
US Fish and Wildlife Service
US Army Corp of Engineers
US Federal Highway Administration
US EPA -Pacific Islands Office
- State:** Department of Agriculture
Department of Bus, Econ. Dev. and Tourism
Department of Labor and Industrial Relations
UH Environmental Center
Department of Health- Environmental Health Administration
Department of Land and Natural Resources
Department of Land and Natural Resources, Historical Preservation
Department of Hawaiian Home Lands
Office of Hawaiian Affairs
Hawaii Department of Transportation
- County:** Planning Department
Department of Environmental Management
Department of Parks and Recreation
Department of Public Works
Department of Water Supply
Office of Housing and Community Development
Police Department
Fire Department

Libraries: Honokaa Public Library

Hilo Public Library

UH Hilo Library

Elected Officials: Dwight Takamine (Senate District 1)

Mark Nakashima (House District 1)

Dominic Yagong (Council Member)

Billy Kenoi (Mayor)

Neil Abercrombie(Governor Elect)

Individuals: Tom Young, (Hamakua SWCD)

Noel Ide (Hamakua SWCD)

Mike DuPonte, (University of Hawaii, County Extension Agent,
Hilo Livestock Programs)

Patrick Niemeyer(NRCS Soil Scientist)

Steve Dias Sr. (Irrigation System Supervisor/worked at this site
during sugarcane time for Hamakua Sugar Company from
1967-1994 knows TMKs from top to bottom

Theresa Donham (State Historic Preservation)

Nancy McMahon (State Historic Preservation Division
archaeology and historic preservation)

Mike Krochina (Krochina Engineering, Inc.)

3.0 Description of Proposed Action

3.1 Background

Kees was born and raised in Ouderkerk a.d. Amstel in The Netherlands(Holland), where he was raised on the Family dairy. After school and during breaks, he helped his father on the dairy, learning from the start the hard work that goes into the dairy life! When it came time to further his education, Kees chose the field of construction. He attended trade school in the Netherlands and went on to perfect his talents. Although he enjoyed the construction field, he always missed the dairy. Unfortunately his father had passed away so returning to the family business was no longer an option. Kees continued construction work and started his own construction company in the Netherlands.

Meanwhile, back in the USA, California to be exact, Malena was born to a Dutch Father and American Mother. Malena's father owned a dairy in Corona, California. During her childhood Malena spent summers and holidays helping on the dairy wherever necessary. After high school, she attended Riverside City College and California State Fullerton University leaning towards a degree in education. Getting sidetracked along the way, Malena attended and completed Skadron Business College courses just a little slow in her typing and shorthand speeds. During her Skadron days is when Kees entered her life.

Kees and Malena were married in Lake Elsinore, California in May of 1980 and lived in the Netherlands for several years. Kees continued his carpentry business and Malena started working for Bart van Wees on Bovenkerkerweg in Amstelveen, helping to feed animals, clean the barns and make Gouda Cheese! Malena had a lot of fun learning the how to make cheese and visiting with all the tourists that would come and watch the cheese making process. It was fascinating learning the entire process; from feeding the cows, milking them, cleaning the machines and barn, making the cheese, cleaning the cheese area, feeding the whey back to the animals, caring for the cheese that was aging, talking to the tourists and explaining the process to them. Every aspect was enjoyable!

After a few years of life in the Netherlands, Kees and Malena received a call from Malena's father. He wanted to know if they would like to come back to run the family dairy which was now located in Tillamook, Oregon. So Kees and Malena packed up their belongings and moved back to the USA and began working on

the dairy. After some time Malena's father was ready to retire and so the Keas purchase the dairy from him.

Kees and Malena spent 13 plus years dairying in Oregon, producing milk for Tillamook County Creamery Association. All the while, they wished that they could make their own cheese thus improving their cash flow. The only problem was that there were too many cheese companies, the granddaddy of them all being Tillamook County Creamery Association (TCCA). Since they had a contract with TCCA giving them all the milk that the Dairy could produce, it would be too difficult (and costly) to make the transition to making their own cheese.

Finally the opportunity came! In 2003 Kees and Malena's accountant told them of an owner of a dairy on the Island of Hawaii that was looking for someone to help run the dairy there. After much discussion (the rain is much warmer in Hawaii than in Tillamook) Kees and Malena decided to make the move, along with their four children, to the Island of Hawaii! There they could make cheese!

After 5 years of managing Island Dairy, it was clear the partnership was not going to work out. Management ideas and philosophies were not the same so the partnership ended. But the idea of leaving Hawaii had not entered the Kea's minds. They had found their home. The youngest Kea wanted to dairy with his father, the Keas still wanted to make cheese, and somehow that was going to happen. The Kea's would take their philosophies and put them to work!

3.2 Plans

“Hawaii's dairy industry dries up”... “Last dairy closing in Oahu; milk a concern”... “A fading industry” ...

All recent headlines indicating the down spiral of Hawaii's dairy industry. Our goal is to change this downward spiral to an upswing bringing back the small thriving family farm to Hawaii. Keeping in mind Hawaii's sustainability along the way.

Kees will use his experience in dairying to design a simple eco friendly layout of a small dairy that will be a model of success in many areas, encouraging other small dairies to start up on the Big Island. The design will encompass optimum animal comfort and health as well as being as sustainable as possible. It will be a dairy their son, who also desires to dairy, will be proud to take over.

In the beginning the milk produced at Mauna Kea Moo will be shipped to Meadow Gold in Hilo, and later will also be used to make local cheese and other dairy products through The Dutch Hawaiian Cheesery (*The Cheesery*).

The long term goal is to have several *small* dairies start up on the Island, all shipping milk to Meadow Gold or *The Cheesery* and receiving a decent payout for all their hard work so they can not only survive but enjoy life as well. A large dairy is very expensive to run, but a small dairy can be run by a family. If several small dairies start up, if something happens to someone, one of the other dairies can pick up the slack until things are back to normal, dairyman helping dairyman.

Keeping in mind that simplicity is best and utilizing Hawaii's natural resources is a must, feed for the cows should be grown on the Island. The pastures need to be kept up and worked to maximize yield. Island farmers may try their hand at raising feed for the dairies giving them another crop for income. This could start up another cooperative of sorts. One that purchases the big equipment and either "rents it out" to the dairyman or has employees that run it (thus ensuring it is used properly) for a fair rate so that the dairy doesn't have big payout for the equipment they will only use once in awhile.

3.3 Building and Leasehold Improvements

The dairy facility that Mauna Kea Moo is proposing may be located on either of the two TMK's. (see location map in Appendix) and will be confined to approximately 10 acres. (approx 1400 elevation) It will consist of :

- Milking barn, Holding pen and Loading bay
- Feed and equipment storage building
- Calf housing
- Waste management system (NRCS approved)
- Lined lagoons for anaerobic digestion
- Shades and feed alley
- The infrastructures
- House

Milking barn, holding pen and loading bay : This structure will be a New Zealand style swing milk parlor with holding pen. In this area the cows will be washed and milked. All milking and barn feeding equipment and systems will be housed in this building and the loading bay will be under the same roof. Wash water will be recycled and reused for flushing of alley ways. The barn will have a tank room for storage of milk. The barn building will also have storage area, a medicine room, office, employee break room and bathroom.

Milk processing building: The milk processing building will be the relocated glass building previously located at the Tex Drive In area in Honoka'a. The size of the building is 3500 sq feet and will be located on approximately 4 acres on TMK 3rd/4-1-04:33 at approximately 920' elevation. The processing area will be

built according to state and federal guidelines and rules. A house will also be built on this parcel.

Feed and equipment storage building: This structure will be 100' x 40' and consist of 8 bays for storage of feed and farm equipment while not in use.

Calf housing: This is a 60' x 30' structure for housing calves in individual stalls.

Waste management system: This will be a system, approved by the NRCS, for collecting all manure and waste at the barn, holding pen, and concrete surfaces into a collecting pit. This will be agitated and pumped over a manure separator located above the pit. The solids which will be separated will be conveyed to a curing area for production of compost. The effluent is used for flushing lanes (recycled) and as a nutrient for the pastures. (See Appendix for flow chart and pictures.)

Shades and feed alley: Shades will be approx 200' x 18' and will cover concrete feed area to keep cows cool and comfortable while eating and feed dry during rain.

The infrastructures: These will include:

- 1) 3 phase power at the facilities
- 2) improving and paving some of the existing roads.
- 3) extensive cross fencing of pastures
- 4) water system

House: For owner or manager

In the future if there is a need for milk another small dairy could be built on the other parcel.

3.4 Use

The use of this property will be for grazing of lactating and non lactating dairy cattle and the facility to milk and conduct activities of a dairy farm. The total number of cattle will be approximately 600 head from birth to mature 1300# animals.(+/- 200 milking +/- 100 dry and 300 heifers and baby calves)

3.5 Financial Projections

The estimated costs of dairy improvements are as follows:

Planning Costs:	\$ 40,000.00
Fencing;	\$ 75,000.00
Infrastructures:	\$140,000.00
Buildings and Structures	\$275,000.00
Milking and Support Equipment	\$175,000.00
Pasture Improvement	\$ 75,000.00
Other Equipment	\$120,000.00
Total Estimated Costs:	\$900,000.00

3.6 Further Design and Process Details

The design and construction of the waste management system will be carried out with assistance of NRCS and the final approval by the Department of Health, Wastewater Branch. However in principal the flow chart in the appendix will highlight the steps necessary in order to address this topic. The size of the facility will have to meet the waste generated as well as allowance for future expansion and handling requirements. In brief the wastewater and manure will be collected in appropriate size concrete pits. This is agitated and pumped over mechanical separators to separate the solids for compost and the effluent is then either recycled to flush surfaces (to remove manure from concrete surfaces) and or is diverted into holding lagoons which are lined for further anaerobic digestion and eventually used for irrigation. The total acreage under irrigation will be approximately 300 acres on TMK 3rd/ 4-1-04:33 plus extra paddocks as needed on TMK 3rd/ 4-2-07-:02 determined by NRCS and Department of Health.

4.0 Description of Action's Technical, Economical, Social and Environmental Characteristics

4.1 Physical Environment

Pasturage and dairy farming on former sugarcane land would be one of the best uses. Pastures would be one of the least disturbing crop with minimal to no cultivation. The proposed use would have no new impact on the physical environment and will enhance the esthetics of the region.

The ownership of these parcels are with the State of Hawaii, Department of Land and Natural Resources. These are believed to be ceded lands and were formerly in sugar cane cultivation. In the Appendix you will find a custom soil resource report done by the USDA NRCS on August 30,2010. Soil samples were taken from 5 different locations (see location map in Appendix) and Mike Duponte from the University of Hilo processed them. The test results follow the NCRS Soil report in the Appendix.

The annual rain fall is from 90-120 inches depending on the elevation. The elevation of the site is from 900 to 2200 feet above sea level and the proposed location of the dairy will be at approx 1400 feet elevation and the processing plant will be at approx 920 feet elevation.

4.2 Social Characteristics

The life style of North Hilo and Hamakua region is distinctly rural with deep ties to agriculture. The warm friendly atmosphere is an integral part of the community. A small family dairy farm and pastures would be consistent with the rural character of the region. If you read the Final Hamakua Agriculture Plan of May 2006 you can see that Agriculture is a key ingredient to their plan. "By supporting and fostering successful diversified agriculture, we honor and maintain the agricultural based lifestyle that defines our community. We create economic opportunities for our residents and create a local food supply allowing the Hamakua community to become more self sustaining"

4.3 Economical Characteristics

A dairy farm would have a very positive impact on the economy of the region in the improvement and the construction phase as well as the operation phase.

The dairy operation would use family, as well local labor. It would run 365 days a year and need labor on a regular basis. There would also be secondary positive impacts such as delivery of some feed and supplies, repair and maintenance which would also occur at the processing level in the plant and retail levels. Agricultural products from other Island producers will also be used in the products produced at the processing level. It will help to bring the Island a step closer to sustainability.

4.4 Public Facilities

On the site, at any one point in time there would be 8-10 employees including family. There will be a graveled public parking for those wishing to visit the facilities and restrooms for employees as well as visitors. There would be no new impact on public facilities, traffic, flood and drainage associated with the proposed use. (There will be no change to the contours that were put in place by the sugar cane company)

4.5 Relationships to Land Use Plans and Policies

Dairy operations and pasturage are consistent with Hawaii State plan as outlined in Chapter 226-6;

(a) Planning for the State's economy in general shall be directed toward achievement of the following objectives:

(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

(2) A growing and diversified economic base that is not overly dependent on a few industries.

and in chapter 226-7

(a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:

(2) Growth and development of diversified agriculture throughout the State.

(b) To achieve the agriculture objectives, it shall be the policy of this State to:

(5) Foster increased public awareness and understanding of the

contributions and benefits of agriculture as a major sector of Hawaii's economy

(13) Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency.

4.6 State Land Use Law

The site is an Agricultural District. The proposed use is permitted within the Agricultural District. A district boundary amendment is not required.

4.7 County Development Plan and Zoning

The current County zoning of the site is agriculture. Under current county zoning, no zone change for the proposed use is required.

4.8 Required Approvals

State of Hawaii:

Department of Health

All constructions have to comply with Title 11, Hawaii Administrative Rules, Chapter 15, Milk, Chapter 20 Potable Water Systems, Chapter 26 Vector Control and Chapter 62, Wastewater. A wastewater management plan to address the animal waste will need to be submitted to Wastewater Branch to be reviewed and approved.

County of Hawaii

Department of Public Works

All construction shall conform to all requirements of code and statues of County of Hawaii. Solid waste management plan shall conform to the rules and regulations of the County of Hawaii, solid waste division.

Planning Department

All construction shall conform to all requirements of code and statues of County of Hawaii.

Department of Water Supply

Any water meters provided by the Department must be installed in accordance to the requirements of the department.

5.0 Summary of Major Impacts

5.1 Short Term

Erosion: There will be a slight increase in possibility of erosion during the construction phase, and a minimal amount during fencing. The facility will be nearly centrally located on existing roads to minimize the need to develop additional roads and therefore the possibility of increased erosion. Furthermore as a practical and prudent management practice the construction will be carried out in phases in the driest period during the year. The total area of the construction will be less than 1% of the total acreage.

Soil: There will be no effect on the soil during the construction phase. The site will be such a small fraction of the total acreage that it will have little to no effect on the landscape.

Traffic: There will be a slight increase in the traffic in and out of the property, however as the site is on the main highway its effect is negligible to the community.

5.2 Long Term

Erosion: Pasture usage would be one of the best uses in terms of erosion. The cow traffic at the dairy site will be concrete surfaces and in the future *if the* rainfall becomes too excessive the cows may need to be housed in free stalls to reduce possible erosion during these periods.

Soil: The soil has been tested and the results is included in this EA.

Air: No effect on air quality is foreseen.

Odor: Since the cows are not confined for a significant amount of time (only during milking) there will be no significant odor from the cows. The facility will also be at approximately 1400' elevation and has an existing buffer of trees surrounding the property. Optimum waste management and animal care will be used as well as following guidelines and rules of the NRCS and Health Department.

Water: The water supply will consist of (1) county water which available for limited use on parcel 33 and will be arranged with the Department of Water Supply as the project progresses. (2) Structures will be designed with a catchment system. This will also avoid any run off. (3) Potable Water can be hauled in if necessary with a stainless steel tank. (4) In the future an engineered well may be drilled for potable water use for

the dairy and processing facilities. (5) Catchment ponds will be put in the higher elevations with help and in compliance with the SWCD, NRCS and DLNR.

Flora & Fauna: Little impact on the flora and fauna is foreseen. The site is already primarily sugarcane and grasses, and there will be little alterations. The primary location of any flora & fauna will be in the gulch areas. These areas have little feed value and are a problem from the management stand point. Therefore all of these areas will be fenced off to the cattle. No effect on the wildlife in the area is foreseen.

Noise: The dairy will generate very little increase in noise levels. The location of the facilities on the site will also provide a buffer zone.

Archeological/Historical Site: No site of historical or archeological significance are known to exist on the site. Because the long-term use of the land for agricultural purposes (sugar cane crops) it is unlikely that any significant historic sites would remain on the 1395 acres of the proposed lease. The maps that have been consulted show some burial sites in the area but none are shown on the 2 TMKs in question. Steve Dias, a long time resident very familiar with the TMKs also recalls no burial or archeological sites on the TMKs. The State Historic Preservation Division is also looking into this for the project. Mauna Kea Moo., LLC has signed up with the SWCD and will be working with them to create a Conservation Plan that fits into all that is important to Hawaii. The use of the subject parcels for the dairy and processing operations will have no effect on significant historic sites. In the unlikely event that some evidence of historic use of this land is found, such as artifacts, the State of Hawaii, Department of Land and Natural Resources State Historic Preservation Division would be notified so that their staff would have the opportunity to investigate the findings. The maps that have been consulted show some burial sites in the area but none are shown on the 2 TMKs in question. The State Historic Preservation Division is also looking into this for the project.

Nancy McMahon was contacted as a cultural assessment provider and has added an archaeological, historical and cultural impact assessment that has been included in the Appendix of this Assessment.

Aesthetic: The dairy and processing facilities will be constructed to enhance the beauty of the land. In developing the facilities Mauna Kea Moo will take advantage of the existing infrastructure such as existing cane roads and natural shade so as not to change its current grandeur.

Economic: The dairy and processing facilities will have a distinct positive economical input on the community. The dairy will provide steady well paid employment. The positive impact will be rippled into supporting

suppliers, service providers, and retail end of the industries. This will also help keep Revenues within the state rather than to mainland producers. There will also be increased tax revenue for the state.

Social: Secure employment in a local agriculture will have a positive social impact. This conforms to the region's history. Supporting community activities and tours for elementary schools will be a regular part of running the dairy and processing facility.

5.3 The Direct, Indirect and Cumulative Impacts of Dairy Waste Management Activities.

A sound waste management plan and facility is a fundamental and integral part of a dairy. Such a plan will both eliminate potential environmental problems as well as increase efficiency of the nutrient replenishment. The Kea's dairy in Tillamook, Oregon worked closely with local and state agencies in preparing a workable Confined Animal waste management plan that worked well with the dairy there and the Kea's and we will do the same here. The dairy on the Hamakua Coast will have to meet the most current standards and requirements in waste management. The overall objective is to minimize waste volume, collect waste, in the process avoid any possibility of leaching and use the effluent for irrigation over sufficient acreage to avoid accumulation of nutrient. This design and adequacy of the facilities will be carried out jointly between The Kea's, the NRCS and the Department of Health. The operation of the system will be monitored by regulatory agencies.

The waste from dairy cattle will be a great asset to the land. A sound management system will enhance the return and supplementation of the nutrients to the land.

Because of the low nutrients found in the soil and grass samples taken (see appendix) The dairy animals will be introduced to the land slowly so that the nutritional value of the pasture can improve. As the pasture improves the AU (animal units) can be increased according to the Land Study Bureau rating system. The local SWCD, NRCS and University of Hawaii County Extension Office will also be consulted to insure proper management.

6.0 Alternatives Considered

A suitable site for a dairy should meet the following criteria;

Size; In order to manage waste properly and provide enough feed for the animal a sizeable parcel of land is necessary. The proximity of the 2 parcels make waste management feasible.

Soil and Climate: A suitable site requires that the right type of soil for productive pastures. The rain fall should also be sufficient throughout the year, however not excessive. The temperature should be cool to avoid heat stress and fly problems.

Infrastructure: Roads, water and power should be in proximity.

Layout: The site must have sufficient buffer zone to avoid negative impacts of agricultural operations such as noise, smell, insect pests or aesthetic impacts.

Availability of Long Term Lease: The substantial investment required will make any lease under 30 years impractical, and 50 years is preferred.

Topography: Low gradient slope are desirable due to reduce erosion and water problems.

The following sites have been considered:

6.1 State Owned Lands

North Hilo, Hawaii, TMK:3rd/3-1-04:01 500 acres by Hakalau

The problem with this site was that it is currently on a month to month lease with someone else who grazes beef animals on it...and the current renter was unwilling to relocate. We could find no more state owned lands suitable.

6.2 Private Lands

(a) The old Island Dairy site in Ahualoa

The problem with this site is that the owners didn't want to lease it out to another dairy.

(b) The old Duarte Dairy site in Paauilo

The problem with this site is also that the owners didn't want to lease it out to another dairy.

7.0 Proposed Mitigation Measures

7.1 Soil Erosion Control Measures

Ground cover and native trees will be retained to avoid run off and soil erosion. The pastures will be laid out to minimize traffic and rotational grazing practices will be adopted to further minimize soil erosion. High traffic area near the barn will be concreted.

In the case of excessive rain fall periods free stalls maybe constructed to further reduce exposure of pastures to cattle in sensitive times. The runoff water on the facility will be captured and utilized to increase efficiency and minimize risks of erosion. Drainage ditches shall be maintained on a regular basis.

7.2 Waste Management

A pasture operation will minimize waste management problems. However an extensive system of collection and use of effluents shall be designed to convert waste into nutrient. This shall be designed to best management practice standards and shall meet the NRCS and Department of Health regulation and standards.

7.3 Natural and Physical Environment

The structures will be located to improve cow traffic and provide a buffer zone to eliminate the possibility of any nuisance noise or smell. It will also be kept clean to avoid smell and fly problems.

The gulches will be fenced off to avoid the cattle entering these areas and possibly destroying any native plants.

The design, construction and use of the facilities shall be conducted with aesthetics in mind. The trees will be preserved and increase whenever possible as they will also provide shade for the cattle. The existing cane roads will be kept in place and improved where needed. The objective of the operation is to blend in the region and community as well as enhance it.

8.0 Determination, Findings and Reasons for Supporting Determination

8.1 Significance Criteria

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long-term effects. In making the determination, the Rules Establish "Significant Criteria" to be used as a basis for identifying whether significant environmental impact will occur. According to the rules, an action shall be determined to have significant impact on the environment if it meets any one of the following criteria:

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resources:

The proposed use is in conformity to its past and designated use. No significant archaeological or historic sites are known.

(2) Curtails the range of beneficial uses of environment:

This site is designated for agricultural use and most desirable for diversified agriculture.

(3) Conflicts with the State's long term environmental policies or goals and guidelines as expressed in Chapter 344, HRS and any revisions thereof and amendments thereto, court decisions, or executive orders:

The proposed use is consistent with the Environmental policies established in Chapter 344, HRS, and Nation Environmental Policy Act.

(4) Substantially affects the economical or social welfare of the community or state:

The dairy and facilities will have a positive impact on economical and social welfare of the community. The economical benefits will further ripple in the county as well as state as the dairy uses more and more of the Islands products in their processing facility.

(5) Substantially affect Public Health:

The design, construction and use of the facility will be carried out with supervision and approval of the Department of Health. The dairy and cheesery will not be allowed to operate if they are deemed to affect public health adversely.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed use is compatible with the region's history and will not create significant secondary impacts.

(7) Involves a substantial degradation of environmental quality.

Proper design and utilization of dairy and processing facility will not have a substantial impact on the degradation of environmental quality. This dairy and processing facility will be constructed to the best management practices to date and will have a positive impact on the overall environmental quality.

(8) Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions"

An efficient dairy operation has to conform to its environment and any conflicts will translate to operational problems for a dairy. Therefore in order to establish a long term profitable operation all the details must be considered in the design, construction and use of the facility. Therefore there are no significant cumulative impacts are anticipated.

(9) Substantially affects a rare, threatened or endangered species or its habitat:

This site is former sugar cane land and all gulches will be fenced off. There are no known endangered plant or animal species on the cultivated region of the sited.

(10) Detrimentially affects air or water quality or ambient noise levels.

A waste management plan is required and its design and use are to prevent any air (smell) and water quality hazards, The noise level will be negligible from such an operation.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary freshwater, or coastal water:

The site does not fall into the above categories. However soil erosion concerns are an integral part of most farming operations. Pasture is the most suitable use in the regard. The design and the location of the facilities will be to minimize soil erosion.

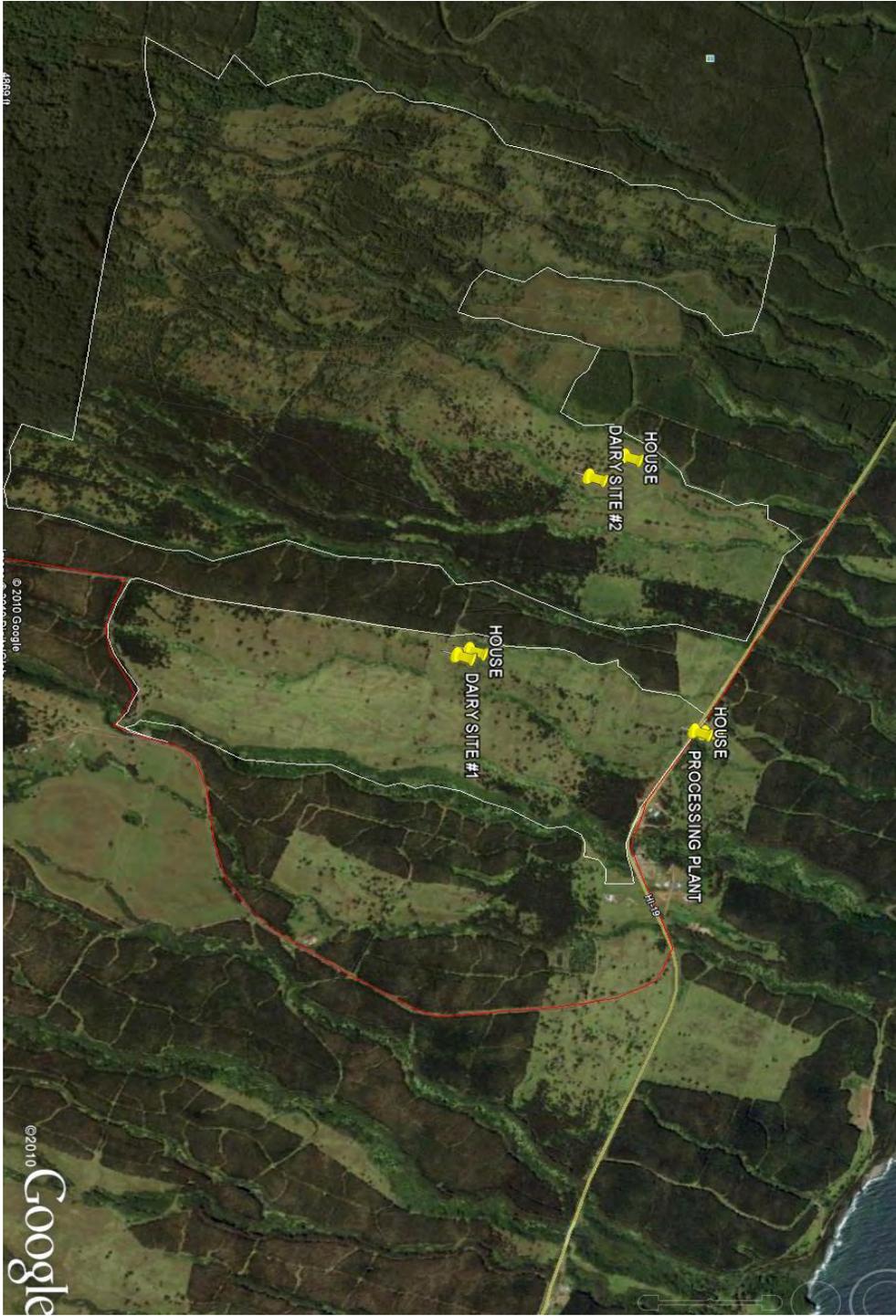
(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies:

Pastures will not significantly affect the scenery. This use will enhance the aesthetics of the region.

(13) require substantial energy consumption:

A dairy and processing facility and pasture operation will not require substantial energy. However planning alternative energy is a goal of the operation. This falls into the self sustainability that the operation will work towards.

APPENDIX



Site Map

**ARCHAEOLOGICAL, HISTORICAL AND CULTURAL IMPACT
ASSESSMENT FOR MAUNA KEA MOO LLC**

**TMK: (3) 4-1-04: 33
4-2-07: 02**

NIUPEA-KAALA, MANOWAIKOHOU-KEKUALELE, HAMAKUA, HAWAII

**NANCY MCMAHON, M.A., M.ED., RPA
November 2010**

INTRODUCTION

Mauna Kea Moo, LLC is seeking a long term lease with the Department of Land and Natural Resources for the use of the above parcels TMK: (3) 4-1-04: 33 and 4-2-07: 02 (1395 acres) for agricultural products including a dairy.

Environmental Setting

The project area is located on the lower northeastern slopes of Mauna Kea and consists of the Hamakua volcanic series (Sterns and MacDonald 1946). The Hamakua volcanic series consist mainly of basaltic lava flows. The soils of the project area are classified as Honokaa, Kukaiaua, and Ookala Silty clay loam which is well drained silty clay loams formed in volcanic ash. The soil was previously utilized for sugarcane until 1991 by Hamakua Sugar Company. The former sugarcane fields are predominantly overgrown with guinea grass (*Panicum maximum*) with a scattering of young Ironwood trees (*Cassurina equisetifolia*). The project area has a history of continuous disturbance for sugar cultivation since the Ookala Sugar Company (renamed Kaiwika Sugar Company-1909, merged with Laupahoehoe Sugar Company - 1957 as Hamakua Sugar Company) in 1969.

Archaeology and Historic Sites and Context

Much of the early surviving history of the Hawaiian Islands had its setting on the island of Hawaii. Archaeological evidence indicates that this island was settled by the Polynesians at least as early as 700 - 800 A.D. Tentative evidence also suggest that it is likely to have been settled as early as 300 - 600 A.D. Many of the significant figures of Hawaiian history before the arrival of Captain Cook had their domains on the island of Hawaii; Paaou, Liloa, Umi-a-Liloa, Keawe-a-Umi, Lonoikamakahiki, Alapainui. This is also true of many significant figures of the early historical times; Kalaniopuu, Kamehameha, Keoua, Ka'ahumanu, Keeaumoku, Kuakini and Kapiolani. The island was also home of special deities such as Pele and Her relatives, and Poliahu. Today historic sites are found throughout each district of Hawaii. Hamakua is one of the district of Hawaii.

HAMAKUA

Most of the early history of the Hamakua district centers on Waipio Valley. The valley was settled early and was the home of several strong rulers since at least the early 13th century. Among the chiefs of Waipio were Liloa and his son Umi. The traditions regarding Liloa indicates he was the first to rule

over the entire island of Hawaii and that his rule was one of peaceful diplomacy.

In 1790, Kamehameha took control of northern Hamakua and Keoua, chief of Hilo after killing his uncle took control of southern Hamakua. Two battles took place in Hamakua with Kamehameha. Keoua was killed by Keeaumoku in Kohala, which led to Kamehameha's control of the island of Hawaii.

In 1823 the Rev. Ellis counted 265 houses in the valley and estimated the population to be 1,325. The number of residents has declined steadily since Ellis' estimate. The same is true of the once populated Waimanu Valley.

Hawaiians also lived in the smaller valleys and gulches along the Hamakua coast and were known to cultivate taro.

In relatively recent historical times there have been Asian and European influences in Hamakua, due primarily to the sugar industry. These influences have erased much of the physical evidence of the earlier culture, but have also introduced a different perspective on historic sites.

The Hamakua Coast was the site of rich agriculture and significant population before Hawaii had contact with the West in the 18th century. In the words of Ross Cordy, Ph.D. who undertook a regional archaeological synthesis of the Hamakua District.

"It was here that the complex political system arose which successfully dominated Hawaii Island and eventually the entire archipelago" (1994:6).

Agriculture consisted of dry land farming of taro, sweet potatoes, bananas and other crops. Houses were concentrated on the lower elevations of the uplands; major trails also crossed this region. Many historical and legendary events occurred along the Hamakua Coast both in Waipio Valley and outside, in the smaller stream valleys and uplands that make up most of the district.

The physical evidence of this heritage has largely been obscured and even erased by the subsequent plantation agriculture. Sugar plantation operated from the mid-1800s until 1991 (when the land was left fallow by Hamakua Sugar Company which closed in 1994), using most of the available land in Hamakua below 2000 feet in elevation. Only the gulches escaped use, but here over a century of overgrowth, stream floods and landslides have taken their toll on the prehistoric landscape.

Over a century of plantation life has itself left a rich landscape expressed best in the many plantation towns scattered along the coast, camp houses, stores, common buildings and streetscapes are charming and replete with cultural and historical information.

Inventory studies undertaken in the 1970s as part of the State's Historic Preservation activities noted the historic resources of the Hamakua. Files at

the State Historic Preservation Division (SHPD) contain information collected during the 1960s on Paauhua, Haina, Paauilo, Ookala and Papaaloo Camps. There are no historic properties for the project area that are listed on the State or National Register of Historic Places. The files at SHPD indicate that no known historic sites located in the project area. A letter from Don Hibbard dated October 22, 1998 (Log No. 22416/Doc No. 9810MS03) for a TMK: (3) 4-1-4: 33 that use of the area for pasture would have "no effect" since that land had been previously cultivated for sugarcane. Based on a review of the literature, aerial photographs, interviews with residence and others knowledgeable about the area there would be no historic properties affected by the continual use of the land for agricultural purposes. Mauna Kea Moo LLC plans to place perimeter fencing for their cattle and fence off all gulleys, gulches and valleys.

Cultural Impact

Interviews were conducted with long time residents of the area who are familiar with Native Hawaiian and other cultural practices. These discussions indicated that there are no Native Hawaiian and other cultural practices dependent on the project area either as a resource or for access purposes. Area residents utilize the higher elevations in the region for pig hunting and the coastal areas for fishing. These activities will not be affected in any way by the proposed dairy.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

There are no known historic properties in the project area and there are no cultural impacts.

The heritage of a community is documented by history, a series of past events. The physical evidence of such documentation is often contained in archaeological and historic sites which support the written or traditional legacy.

The identity of a community evolves from the past. One way of understanding the present is through historic perspective, as our cultural values are basically derived from past generations. A three-dimensional record of the past puts us in a better position to judge and understand our contemporary values, progress, and lifestyles, as well as to illustrate our history.

The State's Historic Preservation Division indicates that over 10,000 have been identified and that there may be a total of 100,000 - 300,000 sites on the island of Hawaii. These sites often provide information of Hawaiian

history and culture prior to the arrival of Captain Cook and for which there often are no written sources. Other sites include those which have been significant in historical times. The historical process encompasses the development and evolution of Hawaii from the earliest settlement to the arrival of the various ethnic groups whose cultural lifestyles have blended to form what is now Hawaii.

There is continuing concern for the historic sites of the County of Hawaii on the part of residents, governmental agencies, and private developers. It is realized that once destroyed, historic sites and the information which they contain cannot be replaced. As the early history of Hawaii was kept through oral tradition, the reconstruction of this period is to a large extent based on the physical evidence of sites. Many landowners are becoming aware that Hawaiian artifacts used in daily living are being removed from their lands for or by collectors. Consequently sites have been despoiled and information regarding the function of site itself and the artifacts have been destroyed. Increased land development and the prices being paid for artifacts by collectors endanger many historic sites.

It is important to recognize that the history of this island is the history of those who live here. Public access to major historic sites has not always been available, and the information derived from sites and its significance have not always been distributed.

The State's Historic Preservation Division in the Department of Land and Natural Resources is charged with a variety of tasks within the State's historic preservation program. It keeps an inventory of known historic sites and promotes surveys to identify and document new sites. It also has a program element to place significant sites on the Hawaii Register of Historic Places and also coordinates the nomination of sites to the National Register of Historic Places.

Archaeological investigations continue to be conducted on the island of Hawaii, adding to the list of known sites. These investigations as well as cultural and historical research are important in identifying significant cultural resources and helping to provide the basis for their protection and management.

Mauna Kea Moo LLC should invite the University of Hawaii at Hilo and/or the North Hawaii Heritage Center to conduct field surveys of the valleys along with further documentation of the plantation lifestyle.



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Island of Hawaii Area, Hawaii



August 30, 2010

Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://soils.usda.gov/sqi/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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Map Unit Descriptions (Mauna Kea Moo Dairy soils)

Island of Hawaii Area, Hawaii

HsC—Honokaa silty clay loam, low elevation, 0 to 10 percent slopes

HsD—Honokaa silty clay loam, low elevation, 10 to 20 percent slopes

HsE—Honokaa silty clay loam, low elevation, 20 to 35 percent slopes

HTD—Honokaa silty clay loam, 10 to 20 percent slopes

KuC—Kukaiiau silty clay loam, 6 to 12 percent slopes

KuD—Kukaiiau silty clay loam, 12 to 20 percent slopes

OoC—Ookala silty clay loam, 6 to 12 percent slopes

OoD—Ookala silty clay loam, 12 to 20 percent slopes

OoE—Ookala silty clay loam, 20 to 35 percent slopes

RB—Rough broken land.

Soil Information for All Uses

Soil Reports

AOI Inventory

Component Legend (Mauna Kea Moo Dairy)

References

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

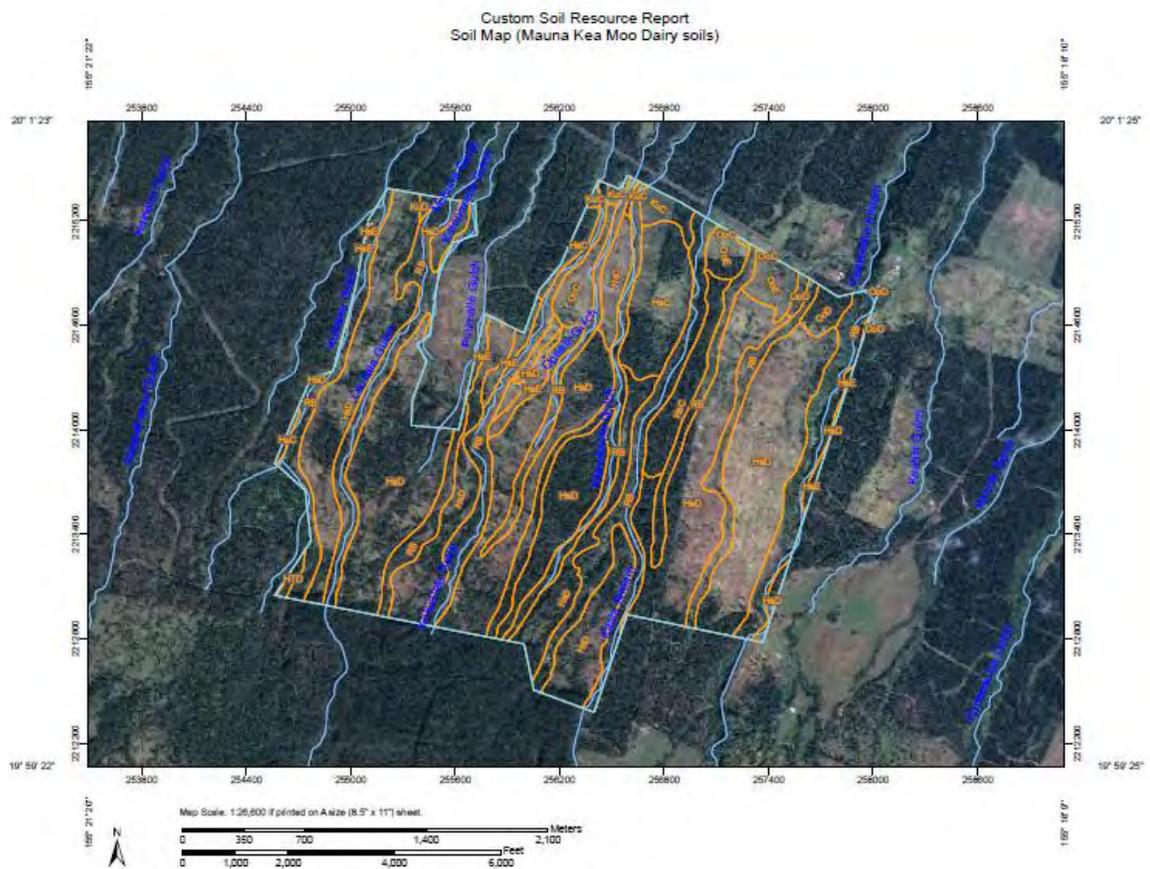
While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



MAP LEGEND

 Area of Interest (AOI)	 Very Stony Spot
Soils	 Wet Spot
 Soil Map Units	 Other
Special Point Features:	Special Line Features:
 Blowout	 Gully
 Borrow Pit	 Short Steep Slope
 Clay Spot	 Other
 Closed Depression	Political Features:
 Gravel Pit	 Cities
 Gravelly Spot	Water Features:
 Landfill	 Oceans
 Lava Flow	 Streams and Canals
 Marsh or swamp	Transportation:
 Mine or Quarry	 Rails
 Miscellaneous Water	 Interstate Highways
 Perennial Water	 US Routes
 Rock Outcrop	 Major Roads
 Saline Spot	 Local Roads
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	
 Spot Area	
 Stony Spot	

MAP INFORMATION

Map Scale: 1:26,600 if printed on A size (8.5" X 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 5N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Hawaii Area, Hawaii
 Survey Area Data: Version 3, Sep 21, 2009

Date(s) aerial Images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Mauna Kea Moo Dairy soils)

Island of Hawaii Area, Hawaii (HI801)			
Map Unit Symbol	Map Unit Name	Aores In AOI	Percent of AOI
HsC	Honokaa silty clay loam, low elevation, 0 to 10 percent slopes	132.0	8.2%
HsD	Honokaa silty clay loam, low elevation, 10 to 20 percent slopes	867.0	54.1%
HsE	Honokaa silty clay loam, low elevation, 20 to 35 percent slopes	29.1	1.8%
HTD	Honokaa silty clay loam, 10 to 20 percent slopes	3.2	0.2%
KuC	Kukalau silty clay loam, 6 to 12 percent slopes	18.7	1.2%
KuD	Kukalau silty clay loam, 12 to 20 percent slopes	2.4	0.1%
OoC	Ookala silty clay loam, 6 to 12 percent slopes	23.0	1.4%
OoD	Ookala silty clay loam, 12 to 20 percent slopes	16.2	1.0%
OoE	Ookala silty clay loam, 20 to 35 percent slopes	30.7	1.9%
RB	Rough broken land	479.7	29.9%
Totals for Area of Interest		1,802.0	100.0%

Map Unit Descriptions (Mauna Kea Moo Dairy soils)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called non-contrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example. Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Island of Hawaii Area, Hawaii

HsC—Honokaa silty clay loam, low elevation, 0 to 10 percent slopes

Map Unit Setting

Elevation: 1,000 to 3,000 feet

Mean annual precipitation: 100 to 150 inches

Mean annual air temperature: 66 to 68 degrees F

Frost-free period: 365 days

Map Unit Composition

Honokaa and similar soils: 100 percent

Description of Honokaa

Setting

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Linear *Across-slope shape:* Convex

Parent material: Volcanic ash

Properties and qualities

Slope: 0 to 10 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None *Frequency of ponding:* None

Available water capacity: Moderate (about 7.8 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 6 inches: Silty clay loam

6 to 65 inches: Silty clay loam

HsD—Honokaa silty clay loam, low elevation, 10 to 20 percent slopes

Map Unit Setting

Elevation: 1,000 to 3,000 feet

Mean annual precipitation: 100 to 150 inches

Mean annual air temperature: 66 to 68 degrees F

Frost-free period: 365 days

Map Unit Composition

Honokaa and similar soils: 100 percent

Description of Honokaa

Setting

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Linear *Across-slope shape:* Convex

Parent material: Volcanic ash

Properties and qualities

Slope: 10 to 20 percent *Depth to restrictive feature:* More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches *Frequency of flooding:* None

Frequency of ponding: None *Available water capacity:* Moderate (about 7.8 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 6 inches: Silty clay loam *6 to 65 inches:* Silty clay loam

HsE—Honokaa silty clay loam, low elevation, 20 to 35 percent slopes

Map Unit Setting

Elevation: 1,000 to 3,000 feet

Mean annual precipitation: 100 to 150 inches

Mean annual air temperature: 66 to 68 degrees F

Frost-free period: 365 days

Map Unit Composition

Honokaa and similar soils: 100 percent

Description of Honokaa

Setting

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Volcanic ash

Properties and qualities

Slope: 20 to 35 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 7.8 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 6 inches: Silty clay loam

6 to 65 inches: Silty clay loam

HTD—Honokaa silty clay loam, 10 to 20 percent slopes**Map Unit Setting**

Elevation: 1,000 to 3,000 feet

Mean annual precipitation: 100 to 150 inches

Mean annual air temperature: 66 to 68 degrees F

Frost-free period: 365 days

Map Unit Composition

Honokaa and similar soils: 100 percent

Description of Honokaa**Setting**

Landform position (two-dimensional): Backslope, summit

Landform position (three-dimensional): Side slope, interfluvium

Down-slope shape: Linear Across-slope shape: Convex

Parent material: Volcanic ash

Properties and qualities

Slope: 10 to 20 percent Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 7.8 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site: Acacia koa-Metrosideros polymorpha/Cibotium menziesii/ Freycinetia arborea (F159AY500HI)

Typical profile

0 to 6 inches: Silty clay loam 6 to 65 inches: Silty clay loam

KuC—Kukaiau silty clay loam, 6 to 12 percent slopes**Map Unit Setting**

Elevation: 500 to 1,500 feet

Mean annual precipitation: 70 to 100 inches

Mean annual air temperature: 66 to 68 degrees F

Frost-free period: 365 days

Map Unit Composition

Kukaiau and similar soils: 100 percent

Description of Kukaiau Setting

Landform: Mountain slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Volcanic ash

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 48 to 75 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.5 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 10 inches: Silty clay loam
10 to 38 inches: Silty clay loam
38 to 50 inches: Extremely gravelly silty clay loam
50 to 60 inches: Bedrock

KuD—Kukaiau silty clay loam, 12 to 20 percent slopes

Map Unit Setting

Elevation: 500 to 1,500 feet
Mean annual precipitation: 70 to 100 inches
Mean annual air temperature: 66 to 68 degrees F
Frost-free period: 365 days

Map Unit Composition

Kukaiau and similar soils: 100 percent

Description of Kukaiau Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Volcanic ash

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: 48 to 75 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.5 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 10 inches: Silty clay loam

10 to 38 inches: Silty clay loam

38 to 50 inches: Extremely gravelly silty clay loam

50 to 60 inches: Bedrock

OoC—Ookala silty clay loam, 6 to 12 percent slopes**Map Unit Setting**

Elevation: 0 to 1,000 feet

Mean annual precipitation: 90 to 120 inches

Mean annual air temperature: 72 to 73 degrees F

Frost-free period: 365 days

Map Unit Composition

Ookala and similar soils: 100 percent

Description of Ookala Setting

Landform: Mountain slopes

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Side slope, rise

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Volcanic ash

Properties and qualities

Slope: 6 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None Available water capacity:

Moderate (about 8.5 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 12 inches: Silty clay loam

12 to 55 inches: Silty clay loam

55 to 60 inches: Extremely cobbly material

OoD—Ookala silty clay loam, 12 to 20 percent slopes**Map Unit Setting**

Elevation: 0 to 1,000 feet

Mean annual precipitation: 90 to 120 inches

Mean annual air temperature: 72 to 73 degrees F

Frost-free period: 365 days

Map Unit Composition

Ookala and similar soils: 100 percent

Description of Ookala Setting

Landform: Mountain slopes

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Side slope, rise

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Volcanic ash

Properties and qualities

Slope: 12 to 20 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately

high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 12 inches: Silty clay loam
12 to 55 inches: Silty clay loam
55 to 60 inches: Extremely cobbly material

OoE—Ookala silty clay loam, 20 to 35 percent slopes

Map Unit Setting

Elevation: 0 to 1,000 feet
Mean annual precipitation: 90 to 120 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 365 days

Map Unit Composition

Ookala and similar soils: 100 percent

Description of Ookala Setting

Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Linear *Across-slope shape:* Concave
Parent material: Volcanic ash

Properties and qualities

Slope: 20 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 12 inches: Silty clay loam
12 to 55 inches: Silty clay loam
55 to 60 inches: Extremely cobbly material

RB—Rough broken land

Map Unit Setting

Elevation: 0 to 3,000 feet
Mean annual precipitation: 50 to 150 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 365 days

Map Unit Composition

Rough broken land and similar soils: 100 percent

Description of Rough Broken Land Setting

Landform: Gulches

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainflank, side slope, rise

Down-slope shape: Linear *Across-slope shape:* Convex

Parent material: Alluvium and colluvium

Properties and qualities

Slope: 35 to 70 percent

Depth to restrictive feature: 15 to 60 inches to paralithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 10 inches: Silty clay loam

10 to 30 inches: Silty clay loam

30 to 60 inches: Bedrock

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The Reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

AOI Inventory

This folder contains a collection of tabular reports that present a variety of soil information. Included are various map unit description reports, special soil interpretation reports, and data summary reports.

Component Legend (Mauna Kea Moo Dairy)

This report presents general information about the map units and map unit components in the selected area. It shows map unit symbols and names and the components in each map unit. It also shows the percent of the components in the map units, the kind of component, and the slope range of each component.

Report—Component Legend (Mauna Kea Moo Dairy)

Report—Component Legend (Mauna Kea Moo Dairy)

Component Legend— Island of Hawaii Area, Hawaii						
Map unit symbol and name	Pot. of map unit	Component name	Component kind	Pot. slope		
				Low	RV	High
HsC—Honokaa silty clay loam, low elevation, 0 to 10 percent slopes						
	100	Honokaa	Series	0	5	10
HsD—Honokaa silty clay loam, low elevation, 10 to 20 percent slopes						
	100	Honokaa	Series	10	15	20
HsE—Honokaa silty clay loam, low elevation, 20 to 35 percent slopes						
	100	Honokaa	Series	20	28	35
HTD—Honokaa silty clay loam, 10 to 20 percent slopes						
	100	Honokaa	Series	10	15	20
KuC—Kukui silty clay loam, 6 to 12 percent slopes						
	100	Kukui	Series	6	9	12

Custom Soil Resource Report

Component Legend— Island of Hawaii Area, Hawaii						
Map unit symbol and name	Pot. of map unit	Component name	Component kind	Pot. slope		
				Low	RV	High
KuD—Kukui silty clay loam, 12 to 20 percent slopes						
	100	Kukui	Series	12	16	20
OoC—Ookala silty clay loam, 6 to 12 percent slopes						
	100	Ookala	Series	6	9	12
OoD—Ookala silty clay loam, 12 to 20 percent slopes						
	100	Ookala	Series	12	16	20
OoE—Ookala silty clay loam, 20 to 35 percent slopes						
	100	Ookala	Series	20	28	35
RB—Rough broken land						
	100	Rough broken land	Taxon above family	35	53	70

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Soil/Plant Analysis Report

Client:	DUPONTE, MICHAEL W. CES, 875 KOMOHANA ST. HILO, HI 96720	Date Reported:	10/18/2010
Agent:		NO AGENT, Office:	NONE
		NONE, NONE NONE	
		, Fax:	

Sample Information

Job Control No:	11-044919-001	Map Unit:		Plant Grown:	OTHER CROP
Sample Label:	1	Soil Series:		Plant to be grown:	OTHER CROP
Date Received:	9/22/2010	Soil Category:	LIGHT SOIL	Can you till 4-6 in.?	Yes
Send Copy To		Soil Depth (in):		Test Results Only?	No
Elevation (ft.):		Latitude:		Longitude:	

Test Results and Interpretation

LIGHT SOIL			INTERPRETATION				
Soil Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
pH	5.7	6.15					
P_ppm	35	67.5					
K_ppm	66	300					
Ca_ppm	42	3500					
Mg_ppm	27	700					
OC_%		No criteria found					
Total_N_%		No criteria found					
Salinity_EC		1.25					
S_ppm		No criteria found					
Fe_ppm	37	No criteria found					
Mn_ppm	7.7	No criteria found					
Zn_ppm	1.2	No criteria found					
Cu_ppm	2	No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					

OTHER CROP			INTERPRETATION				
Plant Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
N_%		No criteria found					
P_%		No criteria found					
K_%		No criteria found					
Ca_%		No criteria found					
Mg_%		No criteria found					
S_%		No criteria found					
Fe_ppm		No criteria found					
Mn_ppm		No criteria found					
Zn_ppm		No criteria found					
Cu_ppm		No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					
NO3_ppm		No criteria found					

Job Control No: 11-044919-001

Problem Description	
OTHER PLANT TO BE GROWN: IMPROVED PASTURE.	

Fertilizer and Lime Recommendations			
Total Nutrient Requirement (lbs/Acre):	Nitrogen: 150	Phosphorus: 100	Potassium: 250
Fertilizer / Lime Material	Total Amount (lbs/Acre)	Applications	Cost Estimate (\$/Acre)
Fertilizer: 10-20-20	1506	split into 2 applns.	271
Lime Material: Coral Limestone	4191	split into 4 applns.	922
Mg Material: Mg-Sulfate	2500	split into 4 applns.	1000

Comments
<p>---- GENERAL INFORMATION ----</p> <ul style="list-style-type: none">o Please indicate the soil series when submitting your soil samples.o Knowing levels of sulfur and micronutrients in plants is also important. For proper diagnosis, tissue analysis is needed.o Split and apply the total amount of lime at 3 months interval..o Split the fertilizer into several applications, once every 6 months until the total amount has been applied.o We recommend that you adopt a nutrient monitoring approach by retaining this sample report for comparison with future samples.

NOTE:

The interpretations are based on Fact Sheet No. 3 "Adequate Nutrient Levels in Soils and Plants in Hawaii."
To help improve future recommendations, please answer the following questions, photocopy this form and return it to above address.
1. Did you need to modify the recommendation? if so, how?
2. Did your plants improve? Please give unit area yield before and after the recommendation was applied.

FEEDBACK

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Soil/Plant Analysis Report

Client:	DUPONTE, MICHAEL W. CES, 875 KOMOHANA ST. HILO, HI 96720	Date Reported:	10/18/2010
Agent:		NO AGENT, Office: NONE NONE NONE, NONE NONE , Fax:	

Sample Information			
Job Control No:	11-044919-002	Map Unit:	Plant Grown: OTHER CROP
Sample Label:	2	Soil Series:	Plant to be grown: OTHER CROP
Date Received:	9/22/2010	Soil Category:	LIGHT SOIL
Send Copy To		Soil Depth (in):	Can you till 4-6 in.? Yes
Elevation (ft.):		Latitude:	Test Results Only? No
		Longitude:	

Test Results and Interpretation							
LIGHT SOIL		INTERPRETATION					
Soil Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
_pH	5.4	6.15					
P_ppm	21	67.5					
K_ppm	62	300					
Ca_ppm	49	3500					
Mg_ppm	16	700					
OC_%		No criteria found					
Total_N_%		No criteria found					
Salinity_EC		1.25					
S_ppm		No criteria found					
Fe_ppm	65	No criteria found					
Mn_ppm	1.6	No criteria found					
Zn_ppm	0.32	No criteria found					
Cu_ppm	1.5	No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					

OTHER CROP		INTERPRETATION					
Plant Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
N_%		No criteria found					
P_%		No criteria found					
K_%		No criteria found					
Ca_%		No criteria found					
Mg_%		No criteria found					
S_%		No criteria found					
Fe_ppm		No criteria found					
Mn_ppm		No criteria found					
Zn_ppm		No criteria found					
Cu_ppm		No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					
NO3_ppm		No criteria found					

Job Control No: 11-044919-002

Problem Description

OTHER PLANT TO BE GROWN: IMPROVED PASTURE.

Fertilizer and Lime Recommendations

Total Nutrient Requirement (lbs/Acre):		Nitrogen: 150	Phosphorus: 329	Potassium: 286
Fertilizer / Lime	Material	Total Amount (lbs/Acre)	Applications	Cost Estimate (\$/Acre)
Fertilizer:	10-20-20	1723	split into 2 applns.	310
Lime Material:	Coral Limestone	4969	split into 4 applns.	1093
Mg Material:	Mg-Sulfate	2500	split into 4 applns.	1000

Comments

---- GENERAL INFORMATION ----

- o Please indicate the soil series when submitting your soil samples.
- o Knowing levels of sulfur and micronutrients in plants is also important. For proper diagnosis, tissue analysis is needed.
- o Split and apply the total amount at 3 months interval..
- o Split the fertilizer into several applications, once every 6 month until the total amount has been applied.
- o We recommend that you adopt a nutrient monitoring approach by retaining this sample report for comparison with future samples.

NOTE:

The interpretations are based on Fact Sheet No. 3 "Adequate Nutrient Levels in Soils and Plants in Hawaii."

To help improve future recommendations, please answer the following questions, photocopy this form and return it to above address.

1. Did you need to modify the recommendation? if so, how?
2. Did your plants improve? Please give unit area yield before and after the recommendation was applied.

FEEDBACK

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Soil/Plant Analysis Report

Client:	DUPONTE, MICHAEL W. CES, 875 KOMOHANA ST. HILO, HI 96720	Date Reported:	10/18/2010
Agent:	NO AGENT, Office: NONE NONE NONE, NONE NONE , Fax:		

Sample Information			
Job Control No:	11-044919-003	Map Unit:	
Sample Label:	3	Soil Series:	
Date Received:	9/22/2010	Soil Category:	LIGHT SOIL
Send Copy To		Soil Depth (in):	
Elevation (ft.):		Latitude:	
		Plant Grown:	OTHER CROP
		Plant to be grown:	OTHER CROP
		Can you till 4-6 in.?	Yes
		Test Results Only?	No
		Longitude:	

Test Results and Interpretation							
LIGHT SOIL			INTERPRETATION				
Soil Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
_pH	5.4	6.15					
P_ppm	41	67.5					
K_ppm	42	300					
Ca_ppm	19	3500					
Mg_ppm	18	700					
OC_%		No criteria found					
Total_N_%		No criteria found					
Salinity_EC		1.25					
S_ppm		No criteria found					
Fe_ppm	72	No criteria found					
Mn_ppm	8.3	No criteria found					
Zn_ppm	1	No criteria found					
Cu_ppm	2.1	No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					

OTHER CROP							
Plant Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
N_%		No criteria found					
P_%		No criteria found					
K_%		No criteria found					
Ca_%		No criteria found					
Mg_%		No criteria found					
S_%		No criteria found					
Fe_ppm		No criteria found					
Mn_ppm		No criteria found					
Zn_ppm		No criteria found					
Cu_ppm		No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					
NO3_ppm		No criteria found					

Job Control No: 11-044919-003

Problem Description
OTHER PLANT TO BE GROWN: IMPROVED PASTURE.

Fertilizer and Lime Recommendations				
Total Nutrient Requirement (lbs/Acre):		Nitrogen: 150	Phosphorus: 100	Potassium: 250
Fertilizer / Lime Material		Total Amount (lbs/Acre)	Applications	Cost Estimate (\$/Acre)
Fertilizer:	10-20-20	1506	split into 2 appns.	271
Lime Material:	Coral Limestone	4969	split into 4 appns.	1093
Mg Material:	Mg-Sulfate	2500	split into 4 appns.	1000

Comments
---- GENERAL INFORMATION ---- o Please indicate the soil series when submitting your soil samples. o Knowing levels of sulfur and micronutrients in plants is also important. For proper diagnosis, tissue analysis is needed. o Split and apply the total amount of lime at 3 months interval.. o Split the fertilizer into several applications, once every 6 months until the total amount has been applied. o We recommend that you adopt a nutrient monitoring approach by retaining this sample report for comparison with future samples.

NOTE:
The interpretations are based on Fact Sheet No. 3 "Adequate Nutrient Levels in Soils and Plants in Hawaii." To help improve future recommendations, please answer the following questions, photocopy this form and return it to above address. 1. Did you need to modify the recommendation? if so, how? 2. Did your plants improve? Please give unit area yield before and after the recommendation was applied.

FEEDBACK

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Soil/Plant Analysis Report

Client:	DUPONTE, MICHAEL W. CES, 875 KOMOHANA ST. HILO, HI 96720	Date Reported:	10/18/2010
		Agent:	NO AGENT, Office: NONE NONE NONE, NONE NONE , Fax:

Sample Information

Job Control No:	11-044919-004	Map Unit:		Plant Grown:	OTHER CROP
Sample Label:	4	Soil Series:		Plant to be grown:	OTHER CROP
Date Received:	9/22/2010	Soil Category:	LIGHT SOIL	Can you till 4-6 in.?	Yes
Send Copy To		Soil Depth (in):		Test Results Only?	No
Elevation (ft.):		Latitude:		Longitude:	

Test Results and Interpretation

LIGHT SOIL		INTERPRETATION					
Soil Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
_pH	5.3	6.15					
P_ppm	24	67.5					
K_ppm	33	300					
Ca_ppm	10	3500					
Mg_ppm	10	700					
OC_%		No criteria found					
Total_N_%		No criteria found					
Salinity_EC		1.25					
S_ppm		No criteria found					
Fe_ppm	43	No criteria found					
Mn_ppm	2.7	No criteria found					
Zn_ppm	0.44	No criteria found					
Cu_ppm	1.5	No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					

OTHER CROP		INTERPRETATION					
Plant Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
N_%		No criteria found					
P_%		No criteria found					
K_%		No criteria found					
Ca_%		No criteria found					
Mg_%		No criteria found					
S_%		No criteria found					
Fe_ppm		No criteria found					
Mn_ppm		No criteria found					
Zn_ppm		No criteria found					
Cu_ppm		No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					
NO3_ppm		No criteria found					

Job Control No: 11-044919-004

Problem Description	
OTHER PLANT TO BE GROWN: IMPROVED PASTURE.	

Fertilizer and Lime Recommendations				
Total Nutrient Requirement (lbs/Acre):		Nitrogen: 150	Phosphorus: 100	Potassium: 200
Fertilizer / Lime	Material	Total Amount (lbs/Acre)	Applications	Cost Estimate (\$/Acre)
Fertilizer:	10-20-20	1500	split into 2 applns.	270
Lime Material:	Coral Limestone	5192	split into 4 applns.	1142
Mg Material:	Mg-Sulfate	2500	split into 4 applns.	1000

Comments	
---- GENERAL INFORMATION ----	
o Please indicate the soil series when submitting your soil samples.	
o Knowing levels of sulfur and micronutrients in plants is also important. For proper diagnosis, tissue analysis is needed.	
o split and apply the total amount of lime at 3 months interval..	
o Split the fertilizer into several applications , once every 6 months until the total amount has been applied.	
o We recommend that you adopt a nutrient monitoring approach by retaining this sample report for comparison with future samples.	

NOTE:	
The interpretations are based on Fact Sheet No. 3 "Adequate Nutrient Levels in Soils and Plants in Hawaii."	
To help improve future recommendations, please answer the following questions, photocopy this form and return it to above address.	
1. Did you need to modify the recommendation? if so, how?	
2. Did your plants improve? Please give unit area yield before and after the recommendation was applied.	

FEEDBACK	

CTAHR

College of Tropical Agriculture & Human Resources
University of Hawaii at Manoa

Agricultural Diagnostic Service Center

Department of Agronomy and Soil Science
1910 East-West Road, Honolulu, HI 96822
Ph: (808) 956-6706/7980 FAX: (808) 956-2592
Email: adsc@ctahr.hawaii.edu

Soil/Plant Analysis Report

Client:	DUPONTE, MICHAEL W. CES, 875 KOMOHANA ST. HILO, HI 96720	Date Reported:	10/18/2010
Agent:		Agent:	NO AGENT, Office: NONE NONE NONE, NONE NONE , Fax:

Sample Information

Job Control No:	11-044919-005	Map Unit:		Plant Grown:	OTHER CROP
Sample Label:	5	Soil Series:		Plant to be grown:	OTHER CROP
Date Received:	9/22/2010	Soil Category:	LIGHT SOIL	Can you till 4-6 in.?	Yes
Send Copy To		Soil Depth (in):		Test Results Only?	No
Elevation (ft.):		Latitude:		Longitude:	

Test Results and Interpretation

LIGHT SOIL		INTERPRETATION					
Soil Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
_pH	5.6	6.15					
P_ppm	33	67.5					
K_ppm	66	300					
Ca_ppm	57	3500					
Mg_ppm	60	700					
OC_%		No criteria found					
Total_N_%		No criteria found					
Salinity_EC		1.25					
S_ppm		No criteria found					
Fe_ppm	58	No criteria found					
Mn_ppm	7.3	No criteria found					
Zn_ppm	0.92	No criteria found					
Cu_ppm	2	No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					

OTHER CROP		INTERPRETATION					
Plant Analysis	Results	Expected	Very Low	Low	Sufficient	High	Very High
N_%		No criteria found					
P_%		No criteria found					
K_%		No criteria found					
Ca_%		No criteria found					
Mg_%		No criteria found					
S_%		No criteria found					
Fe_ppm		No criteria found					
Mn_ppm		No criteria found					
Zn_ppm		No criteria found					
Cu_ppm		No criteria found					
B_ppm		No criteria found					
Mo_ppm		No criteria found					
Al_ppm		No criteria found					
NO3_ppm		No criteria found					

Job Control No: 11-044919-005

Problem Description
OTHER PLANT TO BE GROWN: IMPROVED PASTURE.

Fertilizer and Lime Recommendations				
Total Nutrient Requirement (lbs/Acre):		Nitrogen: 150	Phosphorus: 245	Potassium: 281
Fertilizer / Lime Material		Total Amount (lbs/Acre)	Applications	Cost Estimate (\$/Acre)
Fertilizer:	10-20-20	1500	split into 2 applns.	270
Lime Material:	Coral Limestone	4472	split into 4 applns.	984
Mg Material:	Mg-Sulfate	1750	split into 4 applns.	700

Comments
---- GENERAL INFORMATION ---- o Please indicate the soil series when submitting your soil samples. o Knowing levels of sulfur and micronutrients in plants is also important. For proper diagnosis, tissue analysis is needed. o Split and apply the total amount of lime at 3 month interval. o Split the fertilizer into several applications, once every 6 months until the total amount has been applied. o We recommend that you adopt a nutrient monitoring approach by retaining this sample report for comparison with future samples.

NOTE:

The interpretations are based on Fact Sheet No. 3 "Adequate Nutrient Levels in Soils and Plants in Hawaii."
To help improve future recommendations, please answer the following questions, photocopy this form and return it to above address.
1. Did you need to modify the recommendation? if so, how?
2. Did your plants improve? Please give unit area yield before and after the recommendation was applied.

FEEDBACK



Hamakua Soil & Water Conservation District

Minutes September 29, 2010

Meeting was held at the Hilo Lagoon Center

Present: Thomas Young Chair, Directors Mike Robinson, Michael Surprenant present Noel Ide District Planner, Jessica Newpher and Matthew Wung NRCS Conservationist Hilo and Waimea field offices.

Meeting called to order 12:30 PM.

Minutes of August meetings approved and filed. With Statement of potential conflict of interest by member Mike Robinson. The August minutes will be amended to reflect his statement

Treasures Report approved and filed.

New Cooperator: **Kees & Malena Kea**
Neal Nakamoto

Plan Approval: None

Plan Revision: Robert Culbertson
Vicki Dunaway

Plan Updates: None

Plan Cancellations: None

Subdivision Reviews: None

Next meeting: October 27, 2010

Meeting adjourned: 1:30 PM

P.O. Box 31 Papaaloa, Hawaii 96780







Jerseys



Holsteins



SwingOver™ Milking Parlor System

An economically efficient milking parlor solution

- Automated milk-start (activates detacher automatically).
- Unsurpassed milking technology for proper alignment and milkout.
- Optimal operator comfort.
- Parlor packages to fit your management.

WestfaliaSurge



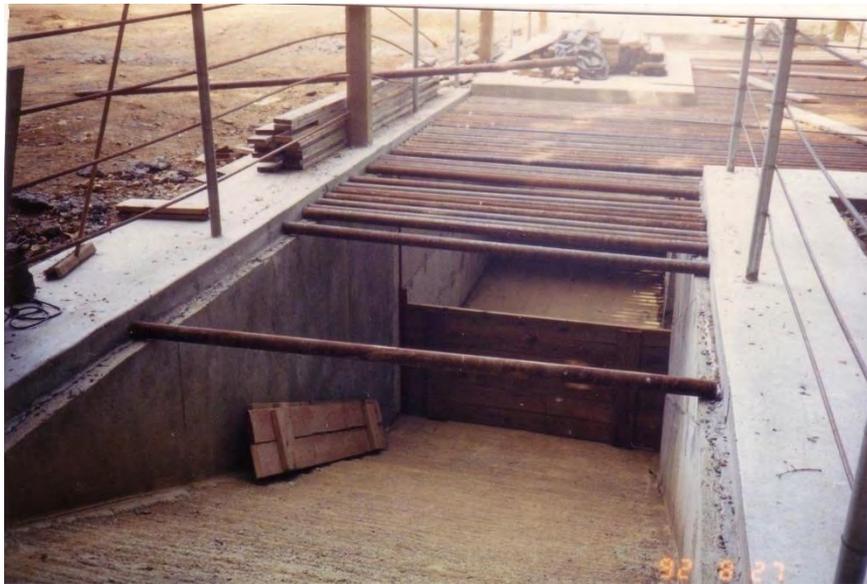
Two compartment underground manure storage



Removable Agitator.

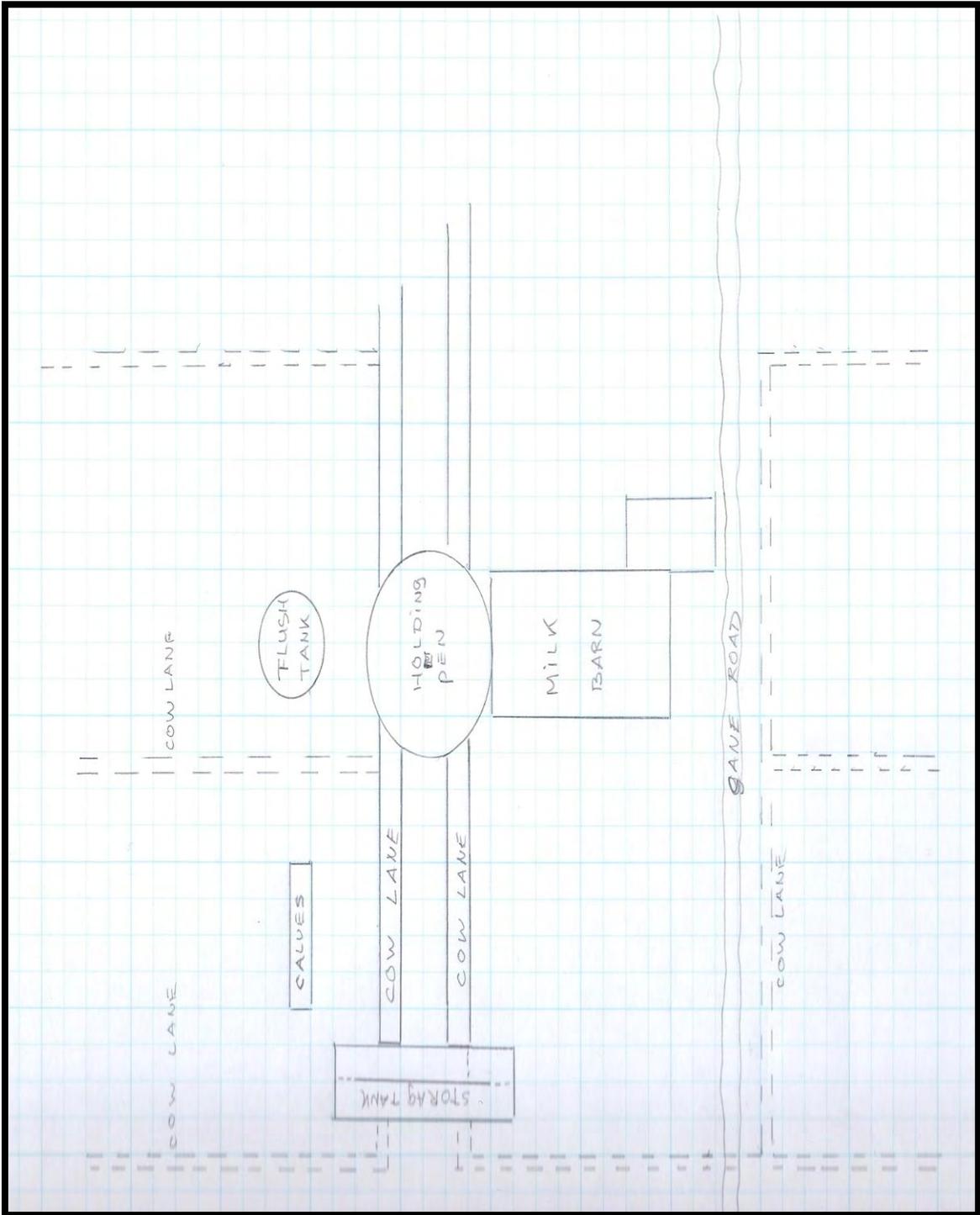


Removable Agitator.



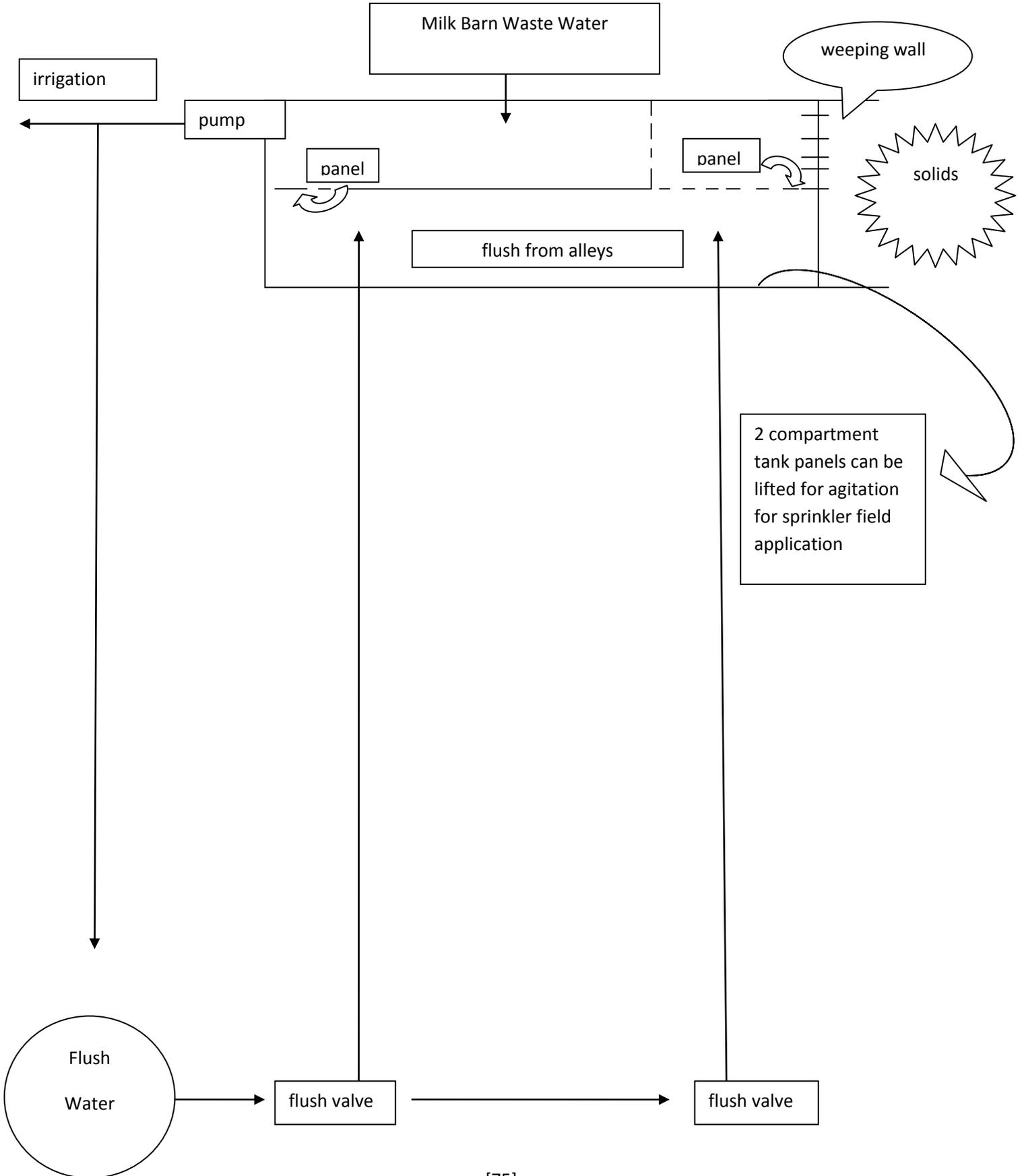
Ramp for cleanout.

Proposed Layout of Dairy Site



Located at either TMK 3rd/4-1-04:33 or TMK 3rd/4-2-07:02 at approximately 1400' elevation
see site map on page 26

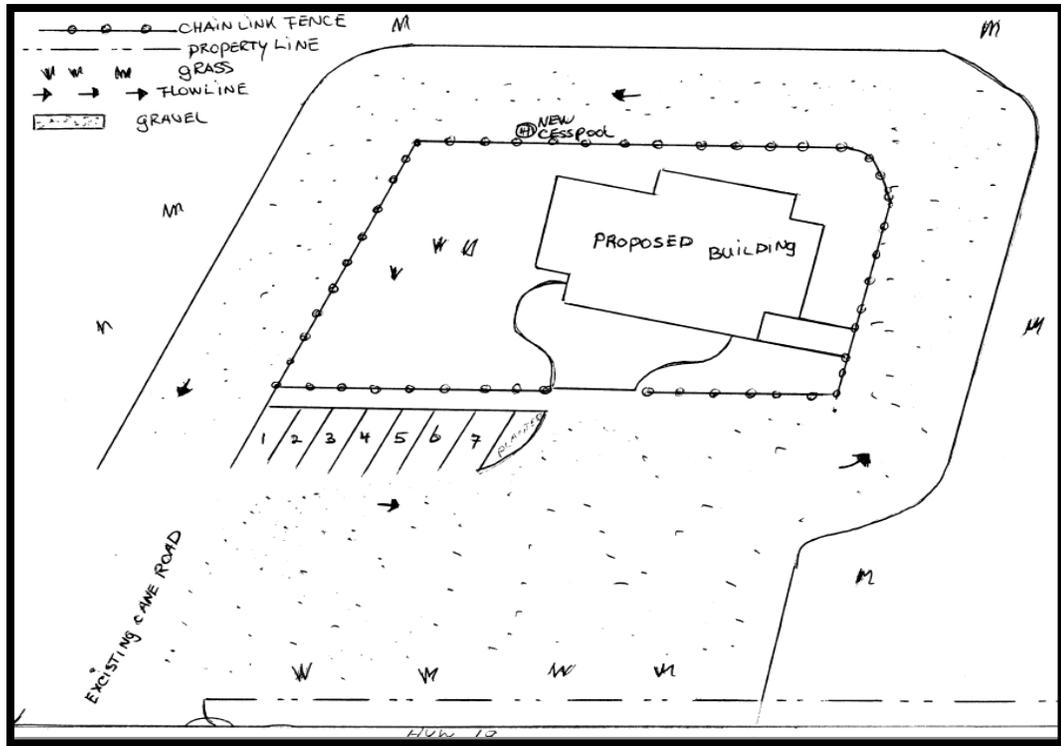
FLOW CHART





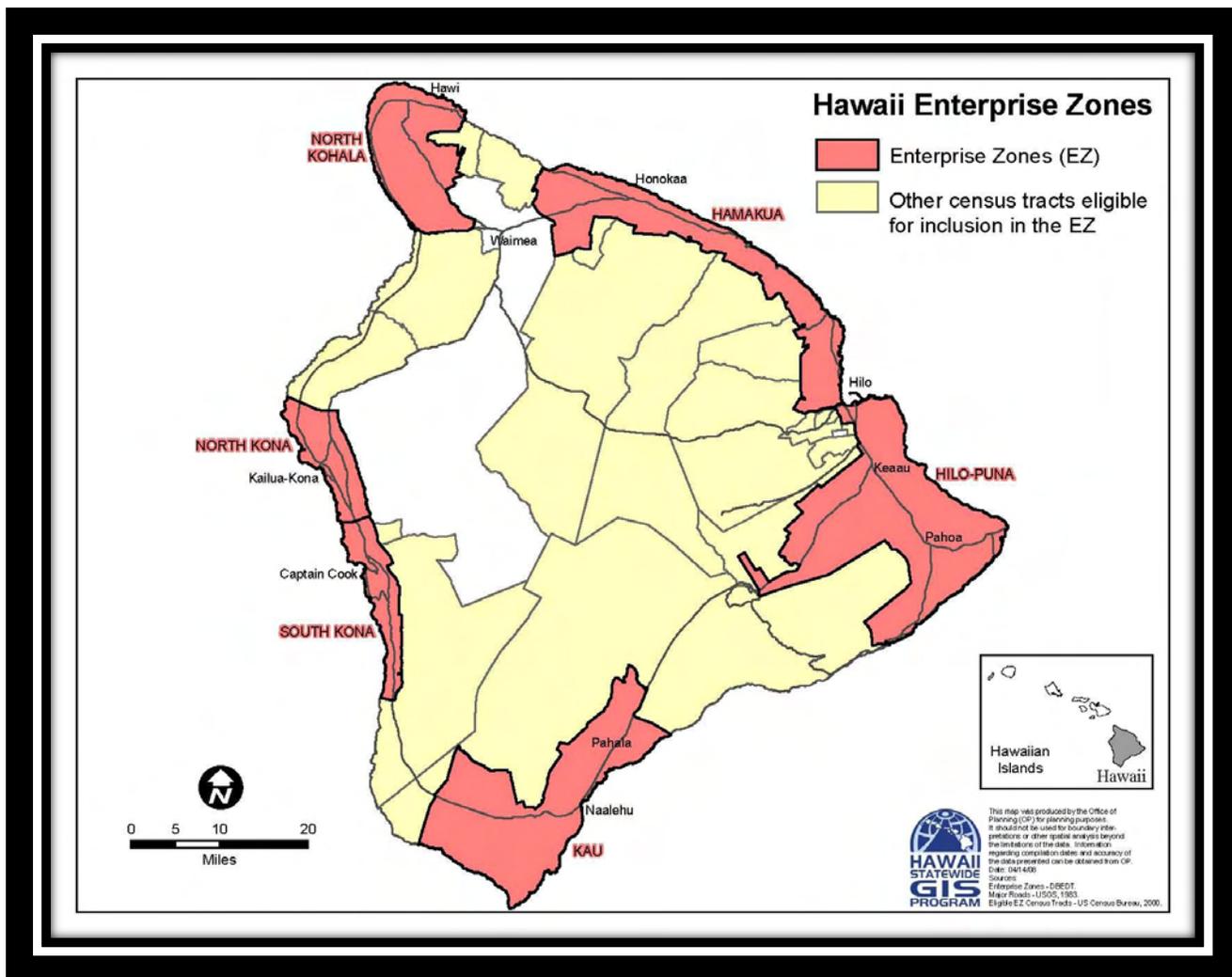
The Future Milk Processing Building

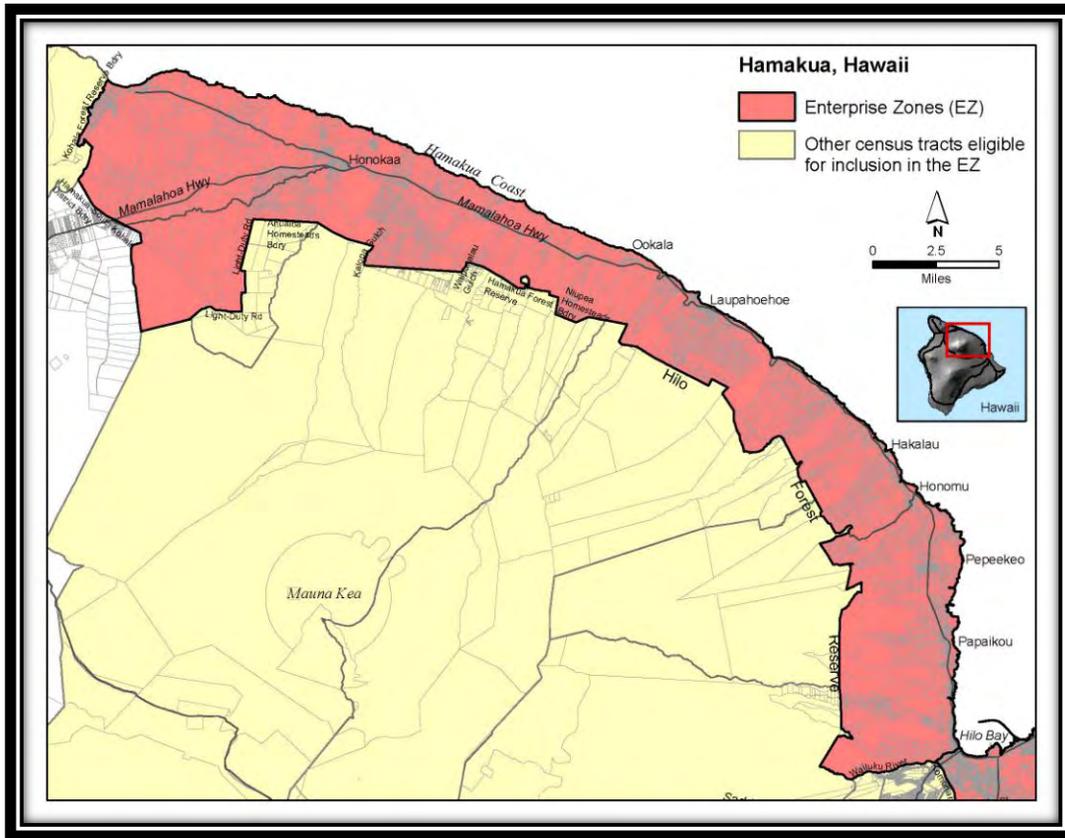
Proposed Layout of Processing Area



Located at TMK 3rd/4-1-04:33
900-920' elevation
see site map page 26

Hawaii Enterprise Zone Partnership Program





The Enterprise Zones (EZ) partnership is a joint state-county effort intended to stimulate—via tax and other incentives—certain types of business activity, job preservation, and job creation in areas where they are most appropriate or most needed. Up to six zones can be designated per county. (See maps for existing zones.)

The proposed lease site is located in the Hawaii Enterprise Zone Partnership Program and the Cheesery has already been accepted by the program and the Dairy is in the application process.

AGENCIES COMMENTS

William P. Kenoi
Mayor



BJ Leithead Todd
Director

Margaret K. Masunaga
Deputy

County of Hawai'i

PLANNING DEPARTMENT

Aupuni Center • 101 Pauahi Street, Suite 3 • Hilo, Hawai'i 96720
Phone (808) 961-8288 • Fax (808) 961-8742

January 3, 2011

Mrs. Malena Kea
P.O. Box 461
Papa'ikou, Hawaii 96781

Dear Mrs. Kea:

SUBJECT: Review of Draft Environmental Assessment
Project: Forty-Year Lease for Dairy Farm, Pasturage, and Milk Processing Plant
TMK: (3) 4-1-004:033, (3) 4-2-007:002; Hāmākua, Hawai'i

Thank you for your letter received November 24, 2010 requesting comments from this office regarding the Draft Environmental Assessment (DEA) for the proposed forty-year lease from the State of Hawai'i for dairy farm, pasturage, and milk processing plant. In addition, the applicant is proposing the planting of native fruit, vegetables, and trees.

The project sites are zoned A-40a (Agricultural-40 acre minimum lot size). The project sites are situated within the State Land Use Agricultural District. In addition, according to the County of Hawai'i General Plan 2005 (amended December 2006), the subject properties are designated as Important Agricultural Lands by the Land Use Pattern Allocation Guide (LUPAG). The subject area is not within the Special Management Area (SMA).

The map provided in Figure 2 does not accurately reflect the State Land Use district. Instead, the map provides the LUPAG designations for the Honoka'a area and not the area for the subject parcels. Please correct this map and/or label to the correct intended map.

Please note that Section 25-2-71 of the Hawai'i County Code (Zoning) states that Plan approval shall be required in the Agricultural district prior to the development of a major agricultural products processing facility.

Mrs. Malena Kea
January 3, 2011
Page 2

We have no further comments to offer, at this time. However, please keep us informed and provide our department with a copy of the Final Environmental Assessment for our records.

If you have any further questions or if you need further assistance, please feel free to contact Bethany Morrison of this office at 961-8138.

Sincerely,

A handwritten signature in cursive script that reads "BJ Leithead Todd".

BJ LEITHEAD TODD
Planning Director

BJM:

P:\wpwin60\Bethany\EA-EIS Review\draftea Mauna Kea Moo Dairy.doc

cc: Mr. Gordon C. Heit
Land Division
Department of Land and Natural Resources
75 Aupuni Street, Room 204
Hilo, HI 96720



January 15, 2011

Ms. Leithead Todd
County of Hawaii, Planning Department
Aupuni Center
101 Pauahi Street, Suite 3
Hilo, HI 96720

Dear Ms. Todd:

Thank you for your letter of January 03, 2011 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii.

As you suggested we contacted Ms. Bethany Morrison and were able to obtain the correct map to replace the LUPAG map that was misused. We also were able to discuss our plans and the doors are open for any discussions or questions we might have. We will keep the Planning Department informed and provide you with a copy of the Final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments for your records .

Again thank you and your department for all your help.

Sincerely,

Kees CJ Kea
Mauna Kea Moo, LLC

William P. Kenoi
Mayor



Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawai'i

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawai'i 96720-3998
(808) 935-3311 • Fax (808) 961-8865

2010 DEC -1 P 12:01

RECEIVED
LAND DIVISION

November 29, 2010

Mr. Gordon C. Heit, Land Agent
Department of Land and Natural Resources
Land Division
75 Aupuni Street, Room 204
Hilo, HI 96720

Dear Mr. Heit:

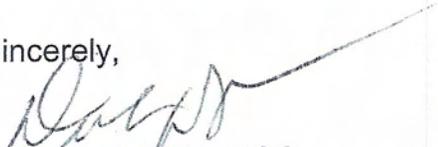
SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR MAUNA KEA MOO, LLC, LONG TERM LEASE FOR DAIRYING PURPOSES, HONOKAA, ISLAND OF HAWAII, DISTRICT 2
TMK: 3rd/4-1-04:33 AND 3rd/4-2-07:02

Staff, upon reviewing the provided document, does not anticipate any significant impact to traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact Captain Mitchell Kanehailua, Commander of the North Hilo and Hamakua Districts, at (808) 775-7533.

Sincerely,


DEREK D. PACHECO
ASSISTANT POLICE CHIEF
AREA I OPERATIONS BUREAU

MK:lli

xc: Kees and Malena Kea



January 15, 2011

Mr. Derek D. Pacheco/Assistant Police Chief
County of Hawaii, Police Department
349 Kapiolani Street
Hilo, HI 96720-8865

Dear Mr. Pacheco:

Thank you for your response letter of November 29, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. We will be sure and contact Captain Mitchell Kanehailua, Commander of the North Hilo and Hamakua Districts if we have any questions .

We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads "Kees CJ Kea". The signature is written in a cursive, flowing style.

Kees CJ Kea
Mauna Kea Moo, LLC

William P. Kenoi
Mayor



Darryl J. Oliveira
Fire Chief

Glen P. I. Honda
Deputy Fire Chief

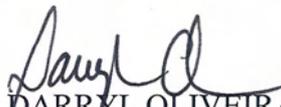
County of Hawai'i
HAWAII FIRE DEPARTMENT
25 Aupuni Street • Suite 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

November 30, 2010

Mauna Kea Moo, LLC
PO Box 461
Papaikou, HI 96781

RE: DRAFT ENVIRONMENTAL ASSESSMENT
MAUNA KEA MOO, LLC LONG TERM LEASE
TMK: 3RD/4-1-04:33 AND 3RD/4-2-07:02

In reference to the above property, our office has no comments for the above referenced draft Environmental Assessment.


DARRYL OLIVEIRA
Fire Chief

GA:lpc





January 15, 2011

Mr. Darryl Oliveira/Fire Chief
County of Hawaii, Fire Department
25 Aupuni Street ; Suite 2501
Hilo, HI 96720

Dear Mr. Oliveira:

Thank you for your response letter of November 30, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads 'Kees CJ Kea'. The signature is fluid and cursive, with a long horizontal line extending to the right from the end of the name.

Kees CJ Kea
Mauna Kea Moo, LLC

William P. Kenoi
Mayor



Robert A. Fitzgerald
Director

Clayton S. Honma
Deputy Director

County of Hawai'i

DEPARTMENT OF PARKS AND RECREATION

101 Pauahi Street, Suite 6 • Hilo, Hawai'i 96720
(808) 961-8311 • Fax (808) 961-8411

2010 DEC -3 A 15:48
CLAYTON S. HONMA
DEPUTY DIRECTOR

December 1, 2010

Gordon C. Heit
Department of Land and Natural Resources
Land Division
75 Aupuni Street, Room 204
Hilo, Hawai'i 96720

Subject: DRAFT ENVIRONMENTAL ASSESSMENT
Applicant: Department of Land and Natural Resources, Land Division
Project: Mauna Kea Moo, LLC Long Term Lease for dairying purpose
Tax Map Key: (3)4-2-07:02

Dear Mr. Heit:

Thank you for the opportunity to review and comment on the subject document. At this time the Department of Parks and Recreation have no concerns or comments to offer as it relates to our department.

Sincerely,

Robert A. Fitzgerald
Director

Copy: Malena Kea (Mauna Kea Moo, LLC)



January 15, 2011

Mr. Robert A Fitzgerald/Director
County of Hawaii, Department of Parks and Recreation
101 Pauahi Street; Suite 6
Hilo, HI 96720-8865

Dear Mr. Fitzgerald:

Thank you for your response letter of December 01, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads "Kees CJ Kea". The signature is written in a cursive style and is enclosed within a faint, light blue oval outline.

Kees CJ Kea
Mauna Kea Moo, LLC



From: [Henry, Sharron](#)
Date: 12/1/2010 9:19:10 AM
To: mamakea@hawaii.rr.com
Cc: gordon.c.heit@hawaii.gov
Subject: DEA for Mauna Kea Moo, LLC

Long Term Lease for dairying purpose
TMK:4-1-04:33 & 4-2-07:02
Island of HI, District 2

Our department has no comments to offer on this project.

Thank you for allowing us to review.

Sharron Henry
Secretary to the Director
County of Hawai'i
Department of Environmental Management
Mailing Address: 25 Aupuni Street
Physical Address: Puainako Town Center,
2100 Kanoiehua
Hilo, HI 96720

Phone: 808.961.8083 or 808.981.8398

Fax: 808.961.8086 or 808.981.2092

Email: schenry@co.hawaii.hi.us

cohdem@co.hawaii.hi.us

http://co.hawaii.hi.us/directory/dir_envmng.htm

Hawai'i County is an equal opportunity provider and employer



January 15, 2011

Ms. Sharron Henry/Secretary to the Director
County of Hawaii, Department of Environmental Management
25 Aupuni Street
Hilo, HI 96720-8865

Dear Ms. Henry:

Thank you for your email response of December 01, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kees CJ Kea". The signature is stylized and fluid, with a large loop at the beginning and end.

Kees CJ Kea
Mauna Kea Moo, LLC

Mauna Kea Moo, LLC
P.O. Box 461, Papaikou, HI 96781 808-938-9249 or 808-937-4770



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879
HONOLULU, HAWAII 96805

December 8, 2010

Mr. Gordon Heit
Department of Land and Natural Resources
75 Aupuni Street, Room 204
Hilo, Hawaii 96720

Dear Mr. Heit:

Subject: Draft Environmental Assessment, Mauna Krea Mo, LLC,
Long Term Lease for Dairying Purpose, Hawaii

Mahalo for the opportunity to comment on the subject report.

Aside from the more direct economic impacts, like construction jobs, please provide a description of the project's overall economic impact on the cattle and dairy industry of the State of Hawaii and cheese production. Will this venture provide new opportunities for other dairy operations?

Please add our homestead association in the region, the Waimea Hawaiian Homestead Association, to your consultation list.

Be advised that use of former State sugarcane land will trigger the payment of 30% of State revenues to this department.

We appreciate your consideration in this matter. If you have any questions, please contact Darrell Yagodich, Planning Program Manager, at 808-620-9481 or darrell.c.yagodich@hawaii.gov.

Aloha and mahalo,

A handwritten signature in black ink, appearing to read "Kaulana H.R. Park".

Kaulana H.R. Park, Chairman
Department of Hawaiian Home Lands

cc: Waimea Hawaiian Homestead Association



January 15, 2011

Mr. Kaulana H.R. Park/Chairman
State of Hawaii, Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, HI 96805

Dear Mr. Park:

Thank you for your response letter of December 08, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. In response to your questions of the projects economic impact on the cattle and dairy industry of the State of Hawaii and cheese production we have the following comments:

- The start up of the Mauna Kea Moo Dairy will be a model for other small family run dairies to follow and stay within environmental guidelines while bringing an livable income to the operator. As long as land and water is made available for locating these small dairies they should start to appear.
- We plan to bring more jersey cows which a smaller and more suitable to the Hawaiian land as well as producing more butterfat and protein for a higher cheese yield.
- Cheese made from cow's milk produced on the Island made available to the public is just about nonexistent. This will change with the start up of the Mauna Kea Moo Dairy. We will be able to keep the product as natural as possible under state regulations giving the Island consumer a better product. Also aiding the Island in its quest to become sustainable.

As you requested we will add the Waimea Hawaiian Homestead Association to our consultation list...the more input we get in the beginning of this project will help us to achieve our goal of becoming truly a part of the Hawaiian Island. We want everyone who lives on the Island to refer to Mauna Kea Moo as "Our Big Island Dairy".

Mauna Kea Moo, LLC
P.O. Box 461, Papaikou, HI 96781 808-938-9249 or 808-937-4770



Mr. Kaulana H.R. Park/Chairman
January 15, 2011
Page 2

The added plus to the success of Mauna Kea Moo Dairy is that it will take former sugarcane land that is currently bringing in no income to the Island to bringing in not only our lease payment but our tax revenue to the state....and 30% of that to your department....a win, win situation all around.

Again, thank you for your comments, we will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads 'Kees CJ Kea'. The signature is stylized and enclosed within a blue oval.

Kees CJ Kea
Mauna Kea Moo, LLC



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

HRD10/5412

December 13, 2010

Gordon C. Heit, Land Agent
Department of Land and Natural Resources- Land Division
75 Aupuni Street, Room 204
Hilo, Hawai'i 96720

**Re: Mauna Kea Moo, LLC Draft Environmental Assessment
Lease of State lands for dairy operations
Hāmākua, Island of Hawai'i**

Aloha e Gordon Heit,

The Office of Hawaiian Affairs (OHA) is in receipt of a November 22, 2010 request for comments on a draft environment assessment (DEA) to support the proposed lease of multiple parcels (parcels) encompassing approximately 1395 acres of land to support the dairy operations of Mauna Kea Moo, LLC (applicant). It is our understanding the parcels are under the control of the Department of Land and Natural Resources and the applicant is seeking to lease the parcels for 40-years. The DEA will be a primary document to support the Board of Land and Natural Resources (BLNR) consideration of issuing the leases. Because the use of State lands is proposed, a DEA in compliance with Chapter 343, Hawaii Revised Statutes is required.

In general OHA recognizes the efforts of the applicant to secure long term leases to support dairy operations. One of the fundamental objectives of the State Agricultural Function Plan (1991) is to encourage and develop diversified agriculture throughout Hawai'i which will support our local economy and contribute to reducing our dependence on imported products. We firmly believe this objective can be obtained and proposed dairy operations such as this one have the potential to be sustainable endeavors. We look forward to seeing this potential fully achieved.

Based on the information contained within the DEA, it appears the applicants have experience in the industry and have expressed their commitment to establishing a family owned and operated dairy operation. We offer the following preliminary comments on the DEA:

Lease Area

We would like to see additional discussion on whether the applicant's proposal to run a herd of approximately 600 head of cattle consisting of 200 milk cows warrants the need to lease nearly 1400 acres of land.

Soil Deficiencies

The appendices to the DEA detail the soils within the proposed lease area (which are fallowed sugar cane lands) are deficient in nutrients and micronutrients necessary for certain grass feeds. While OHA recognizes the applicant intends to "slowly introduce" cattle into the lease area and implement a manure composting system, it is unclear whether this will be adequate to address soil deficiencies and the use of chemical fertilizers will be required. It is unclear whether the applicant intends to introduce grass species into the lease area.

Wells

Section 5.2 of the DEA briefly mentions the possibility of drilling wells within the lease area for potable water use. There should be additional discussion on this possibility in the DEA.

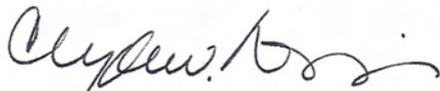
Archaeological and Cultural Assessment

The archaeological and cultural assessment in the DEA appears to be rather general in nature and OHA recommends additional consultation efforts with community members who may be knowledgeable of the traditional cultural history of the lease area and willing to share that information with the applicant.

Conclusion

Thank you for the opportunity to provide comments. We look forward to reviewing the final environmental assessment and OHA anticipates the opportunity to provide additional comments on the lease of State Lands when the proposal goes to the BLNR for consideration. Should you have any questions or concerns, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia 'i 'o,



Clyde W. Nāmu'o
Chief Executive Officer

C: OHA- East Hawai'i Community Resources Coordinator

Mauna Kea Moo, LLC
P.O. Box 461
Papaikou, Hawaii 96781



January 15, 2011

Mr. Clyde W. Namu'o/Chief Executive Office
State of Hawaii, Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813

Dear Mr. Namu'o:

Thank you for your response letter of December 13, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. In response to your comments we offer the following:

Lease Area

If the approximate 1400 acres of land Mauna Kea Moo Dairy proposes to lease was level or gently rolling it would be a lot of land for 600 animals in various states of growth...but since much of it is located on the side of a hill much of the land will be difficult for the cows to access. The land also contains gulches that will need to be fenced off and animals kept out of as well as lots of trees that have grown over the time that the land laid fallow....leaving less useable, graze able land. As organic fertilizer is introduced, grazing grasses will increase and the land will become more productive...but in the beginning feed will be minimal.

Soil Deficiencies

If Mauna Kea Moo Dairy is able to secure the lease from the State of Hawaii, we will begin mow the old grass and introduce manure to the area's that can easily be fertilized and see how the local grass grows and how nutritional it is with the added manure and natural fertilized that were added. Then with the help of the University of Hawaii and the extension office...we can find the right combination of grasses that will be most nutritional for the cows and production. Our intention is to go slow so that no chemical fertilizers will be necessary...this may mean at first bringing in some of the feed....but the goal will be to produce our own (or have farmers in the area produce what works for the cows) without artificial fertilizers or chemicals.



Mr. Clyde W. Namu'o/ Chief Executive Office
January 15, 2011
Page 2

Wells

The County of Hawaii, Department of Water Supply can supply us with 400 gallons of water a day for each of the TMKs we propose to lease. The rest of the water will need to come from catchment or hauled in to begin with. Eventually we would like to have a well engineered and drilled to help make the dairy self sustaining. Having to haul water will be an expense in both time and fuel...if we are able to drill a well we will be able to supply the dairy with much more ease...and because it will be engineered it will meet the Department of Health requirements for potable water in the milk process for selling to the public.

Archaeological and Cultural Assessment

Mauna Kea Moo was lucky to have Nancy McMahon to help with the Archaeological, Historical and Cultural Impact Assessment part of the DEA. During the planning footwork for this dairy we have talked with many local residents. When we would stop at the 50's restaurant for lunch after walking the land and planning we would meet up with old timer and talk about our plans to build a new dairy and they all happily gave their advice and told of their experiences with the area. On one occasion there was an elderly gentleman sitting outside talking story with an ex Laupahoehoe policeman that Kees knew...we stopped to talk and the old timer recalled the times of the sugarcanes and told us not to mess with the slope of the land...it had been formed that way for good drainage. Others spoke of hunting wild pig through the cane fields...Tom Young worked for the Sugar companies while they were up and running supports that sugarcane is what the land was used for....all that we have spoke to through the years have unanimously agreed that a dairy was the perfect use for the land and this location...the only concern anyone has come up with is the lack of water. Agriculture is all anyone can recall the land being used for.

I recently talked story with Paul Tallett and he went into what I thought was some interesting Hawaiian history bringing up an interesting fact ; in 1823 the Church of England hired William Ellis to do a census in Hawaii. There was a population of 150,000 Hawaiians living self sustaining lives... The same path was followed 100 years later with very few living self sustaining lives. With hard work and dedication ,we can get back to sustainability on the Islands. We are so far away from everyone...we need to rely on ourselves and what this great Island can give to us.



Mr. Clyde W. Namu'o/Chief Executive Office
January 15, 2011
Page 3

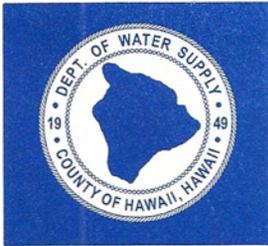
If for some reason even with all our precautions, we should come across an archaeological site during the building of the dairy and processing facility we will stop all work and contact the Office of Hawaiian Affairs as well as the Department of Land and Natural Resources, Historical Preservation.

Again, thank you for your comments and I hope we were able to answer your Department to your satisfaction. We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads "Kees CJ Kea". The signature is written in a cursive style and is enclosed within a light blue oval shape.

Kees CJ Kea
Mauna Kea Moo, LLC



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII

345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAII 96720

TELEPHONE (808) 961-8050 • FAX (808) 961-8657

January 10, 2011

Malena Kea
P.O. Box 461
Pāpa'ikou, HI 96781

**DRAFT ENVIRONMENTAL ASSESSMENT
MAUNA KEA MOO, LLC LONG TERM LEASE FOR DAIRYING PURPOSES
TAX MAP KEY (3) 4-1-004:033 AND 4-2-007:002**

We have reviewed the subject Draft Environmental Assessment and have the following comments.

The nearest existing Department of Water Supply facility to the subject parcels is a 2 ¼-inch waterline located within the Old Māmalahoa Highway, approximately 2,500 feet from Tax Map Key (3) 4-2-007:002 and approximately 6,000 feet from Tax Map Key (3) 4-1-004:033.

As neither of the subject parcels front the 2 ¼-inch waterline, water is limited to one (1) unit of water, or one (1) 5/8-inch meter, for each lot of record. Each service is limited to an average daily usage of 400 gallons.

Due to a significant portion of both parcels being situated at elevations where our water system cannot provide adequate pressure, the applicant would be required to execute an Elevation Agreement with the Department. The applicant would also be required to submit a tank and pump system schematic to our Engineering Division for review and approval, for each service.

Also, each service would be required to have a reduced pressure type backflow prevention assembly installed within five (5) feet of the meter on private property. The installation of each backflow prevention assembly must be inspected and approved by the Department before water service can be activated.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

Sincerely yours,

Milton D. Pavao, P.E.
Manager-Chief Engineer

FM:dfg

copy - State of Hawai'i, Department of Land and Natural Resources, Land Division



January 16, 2011

Mr. Milton D. Pavao P.E. /Manager-Chief Engineer
County of Hawaii, Department Of Water Supply
101 Pauahi Street; Suite 6
Hilo, HI 96720-8865

Dear Mr. Pavao:

Thank you for your response letter of December 01, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. We appreciate the information you supplied and will be sure and contact Mr. Finn McCall of the Water Resources and Planning Branch if we need any help or have any further questions.

We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads 'Kees CJ Kea'. The signature is written in a cursive style and is enclosed within a thin blue oval outline.

Kees CJ Kea
Mauna Kea Moo, LLC



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office

300 Ala Moana Boulevard, Room 3-122, Box 50088

Honolulu, Hawaii 96850



In Reply Refer To:
2011-TA-0067

DEC 22 2010

Mr. Gordon C. Heit
State of Hawaii
Department of Land and Natural Resources
Land Division
75 Aupuni Street, Room 204
Hilo, Hawaii 96720

Subject: Technical Assistance for the Draft Environmental Impact Statement for Mauna Kea Moo, Hamakua, Island of Hawaii

Dear Mr. Heit:

The U.S. Fish and Wildlife Service has reviewed the Draft Environmental Impact Statement for the Mauna Kea Moo project, located in the Hamakua District, on the island of Hawaii. We received your letter soliciting our comments on December 1, 2010. The proposed Mauna Kea Moo dairy facility will be located on either TMK 3rd/4-1-04:33 or TMK 3rd/4-2-07:02 and will be confined to approximately 10 acres. The facility will consist of a milking barn, holding pen and loading bay, feed and equipment storage building, calf housing, waste management system, lined lagoons for anaerobic digestion, shades and feed alley, a house and infrastructure. The infrastructure will include power to the facilities, improving and paving some of the existing roads, extensive cross fencing of pastures and a water system.

We have reviewed the project information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program and the Hawaii GAP Program. The federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian hawk (*Buteo solitarius*), Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), and Hawaiian duck (*Anas wyvilliana*) have been observed in the vicinity of the proposed project. There is no federally designated critical habitat in the project footprint. We recommend you address potential project impacts to the sensitive native ecosystems and listed species discussed below, and include measures to minimize adverse impacts to these resources in your Final Environmental Impact Statement.

Hawaiian hoary bats roost in both exotic and native woody vegetation and leave their young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the bat breeding season (May to August), there is a risk that young bats could inadvertently be harmed or killed. Fences constructed of barbed wire result in bat mortality because they become entangled in the barbs. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet tall should not be removed or trimmed

TAKE PRIDE[®]
IN AMERICA 

Mr. Gordon C. Heit

2

during the bat birthing and pup rearing season (May 15 through August 15) and no barbed wire fences should be installed.

Hawaiian hawks also nest in both exotic and native woody vegetation. To avoid impacts to Hawaiian hawks we recommend not clearing any brush or trees during their breeding season (March through September). If you are unable to avoid clearing vegetation during these months, we recommend you conduct surveys for nests prior to any clearing activity. Please contact our office for survey methodology and recommendations for avoiding impacts to nests.

Hawaiian stilt, Hawaiian coot, and Hawaiian duck (collectively known as waterbirds) may be attracted to the lined lagoon. Measures to minimize their attraction, such as covering or enclosing the lagoon, should be considered.

If a project may affect listed species and is funded, authorized, or permitted by a Federal agency, then that agency is required to consult with us pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (ESA). If no Federal agency is involved with the project and implementation of the project could result in take of a listed animal species, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. In addition to a Federal incidental take permit, implementation of the proposed project may also require obtaining a State incidental take license.

We appreciate the opportunity to provide technical assistance in your environmental compliance process for this project. Implementation of these recommendations does not alleviate your responsibilities pursuant to the ESA if a listed species may be affected by the proposed action. If you have any questions regarding this letter, please contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist, Consultation and Habitat Conservation Planning Program (phone: 808-792-9431; email: jeff_zimpfer@fws.gov).

Sincerely,

Christa Russeau

for Loyal Mehrhoff
Field Supervisor



January 16, 2011

Mr. Loyal Mehrhoff/Field Supervisor
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 5088
Honolulu, Hawaii 96850

Dear Mr. Mehrhoff:

Thank you for your response letter stamped December 22 , 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii and offer the following comments to issues your brought up:

Since the Hawaiian Hoary bats breed from May to August and the Hawaiian hawks breed and nest March through September we will do our best to avoid clearing activity between these months. It is our intention to leave as much of the exotic trees and native woody vegetation in its natural state...one of the reasons we are asking for approx. 1400 acres. If for some reason clearing has to be done during this period, we will certainly take every precaution so as not to disturb any nests including contacting your office for survey methodology and recommendations.

We will probably need to fence the perimeter of the leased land with barbed wire as it would not work to let the cows run on other landowners property....but we can experiment with other cross fencing to avoid bat entanglement. One of the advantages of starting up slowly is to be able to experiment so we can find the solution that works best for all including nature.

Our plan is to have the liquid manure storage facility covered so no waterbirds will be attracted to the liquid manure...the only lined storage lagoons would be for fresh water storage ... and we will hopefully find a way to cover those as well so as not to lose too much to evaporation.

We appreciate your comments and suggestions and will be sure to contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist of the Consultation and Habitat Conservation Planning Program if we have any questions or come across any situations that would require his help.

Mauna Kea Moo, LLC
P.O. Box 461, Papaikou, HI 96781 808-938-9249 or 808-937-4770



Loyal Mehrhoff/Field Supervisor
January 16, 2011
page 2

We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads "Kees CJ Kea". The signature is written in a cursive style and is enclosed within a light blue oval shape.

Kees CJ Kea
Mauna Kea Moo, LLC

January 22, 2010

Mauna Kea Moo, LLC
PO Box 461
Papaikou, HI 96781

Gordon Heit
Department of Land and Natural Resources
Land Division
PO Box 936, Hilo, HI 96720

Malena A. Kea
PO Box 461
Papaikou, HI 96781

**Environmental Assessment for Mauna Kea Moo, LLC
Comments**

Aloha:

The opportunity to review the Draft Environmental Assessment is appreciated.

First off I'll introduce myself, I grew up in the general vicinity of the proposed Dairy so am somewhat familiar with the area. My educational background is in structural engineering at the UofH, I hold a BS, and MS degree from the department of Civil engineering. I am involved with several engineering organizations including currently serving in leadership roles. The following comments are my own and should not be associated or attributed to my employer or any of the organizations I am involved in.

I would like to commend Malena and Kees for their vision of developing local agriculture and willing to take on the risk that is associated with such a venture. I do hope the endeavor is successful and they can contribute to our agricultural output in the long term.

I have the following comments, which should be specifically addressed in the final version of the draft EA:

1. Regarding the Social Characteristics (draft EA, PDF page 15), During the long reign of the sugar industry in the Hamakua Coast region, in my experience the roads used for access were typically open, allowing traversal by the public, as well as the landowners. In relatively recent years as the agricultural character of the region shifted to gentlemen "farms" (residential usage) and bovine pursuits I have experienced the proliferation of gates barring access to the roads that were previously open. In my initial reading of your environmental assessment I did not see any mention of whether or not you intend to erect gates where none currently exist. If your fences do cross existing roads, I suggest that consideration be made to install cattle guards instead of blocking the road with a gate. I believe access to the cane haul roads should be preserved for the people that have indigenous uses for the land such as hunting, as well as for the occasional adventurous leisurely driver. If gates are intended to be erected on previously accessible roads, this consideration should be noted in points (1) and (2) under section 8.1 (Draft EA, PDF page 23).

2. Regarding the erosion mitigation in 7.1 (draft EA, PDF page 22), Fencing off the gulches mentioned in item 7.3 on the same page should also be mentioned as a soil erosion control measure. I suggest that some buffer zone be established adjacent to the gulches within the property. I believe the customary fence right at the top of the bank of the gulches is not likely to be sufficient to adequately mitigate the potential for erosion, and the resultant degradation of stream water quality given the very heavy rainfalls that can occur. An additional benefit of a buffer zone would be to reduce the peak flows in the streams by acting as a buffer by retaining water and releasing it more slowly into the stream, the buffer zone would also act as a filter - the trees in the zone adjacent to the stream would process and use the nutrient rich runoff that can be harmful to the stream ecosystems. I suggest a specific width for this buffer zone be established, such as 30 feet from the top of the bank, or whatever makes sense. This zone could be planted with trees that could be selected to provide the farm with an alternate source of income in the long term.
3. Regarding the second paragraph under 7.1 - in the term of the 40 year lease excessive rain fall periods are pretty much a certainty. For construction of the stalls to house the animals during these periods the non-mandatory word " maybe" should be changed to the definite "will be"
4. Regarding waste management, I am concerned that the effluent could be laced with synthetic chemicals such as antibiotics and hormones that are sometimes used in animal husbandry. Beyond merely complying with NRCS and Department of Health standards, I suggest that a commitment be made to eschew the use of these types of synthetic chemicals. Antibiotics should not be used as a preventative health measure for the animals under any circumstances. I am not familiar with NRCS and DOH standards, but if any synthetic additives are used on the animals some mechanism for monitoring the effluent for presence of the chemicals used, or potentially hazardous partially degraded forms of the chemicals should be described and committed to.
5. Maintaining a population of cattle of the magnitude considered, the inevitable conclusion is that the animals will eventually get old and die off to be replaced with younger more productive animals. I do not see any mention of what becomes of the dead cows in your draft EA. What is the mechanism for disposal of the corpses?
6. Regarding the significance criteria No 13 under section 8.1 (Draft EA PDF page 25), "substantial energy" is a poorly defined term, I suggest that some specific projections of energy usage based on data from other Dairies be provided so reviewers can determine whether consumption should be determined to be "substantial". Regarding your commitment to planning alternative energy, I suggest that the dairy investigate utilizing a methane recovery for the waste, to convert to usable energy. With the relatively high prices of electricity on the Big Island, the investment in such a system may have a short time to pay for itself. Regarding the methane issues, the EPA has a program AgSTAR that promotes the recovery and use of Methane from animal manure. They have an assessment program available that is tailored to Dairy facilities. I suggest that an assessment with the EPA system be performed, with the results attached to the Final EA.
<http://www.epa.gov/agstar/tools/project-dev/farmware.html>
7. In the long term impacts starting on PDF page 18 of the draft EA, contribution to climate change is not considered. The release of methane from cattle has been identified as a significant greenhouse gas, with approximately 20 times the effect of the more publicized CO2. These

effects may not be insignificant and should be formally addressed in the final version of the EA. Green house gas emissions may be counteracted in a quantifiable way by the carbon sequestration involved in the increased rate of grass growth in the pastures and any trees you plant. Some effort should be put into quantifying the proposed Dairy's impact on climate change via greenhouse gasses, with mitigation measures taken as appropriate.

8. Regarding the long term effect on erosion under 5.2 (Draft EA page 18). I dispute the claim that pasture usage is one of the best uses in terms of erosion that is made in 5.2 and reasserted in item 11 under 8.1. A poorly managed, overgrazed pasture will promote erosion, which I have personally seen happen on Hamakua soil. If you claim that your operation will indeed be one of the best uses in terms of erosion, I suggest you back up this claim with some data, comparing it to other uses, such as forestry, etc. Your commitment to use rotation grazing is a valid mitigating measure, additionally you should note under 7.1 that the animals will not be allowed direct access to surface water, and I reiterate my suggestion that a buffer zone be provided around the riparian areas. Per recommendations of the College of Tropical Agriculture and Human Resources (CTAHR): <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/HF-8.pdf>, a conservation plan for pasture areas reviewed by CTAHR should be appended to the final EA to demonstrate that proper pasturing practices have been considered and are intended to be followed.
9. For the site plans in the appendix, the nearest distance to surface water features should be labeled. Site placement of the improvements should be such that the distance to streams is maximized to avoid the possibility of their contamination.
10. In your sketch of the proposed layout of the processing area (Draft EA PDF page 78), a new cesspool is labeled, apparently within the road way. First of all, I suggest that the cesspool location be revised to fall somewhere outside the roadway, there is no reason to subject the cesspool cap to the loads imposed by the road and traffic, if access to the cesspool is required for maintenance routing traffic may be inconvenient. Additionally the use of a cesspool is questionable, although this is outside my field of expertise, I believe that a septic tank system is the preferred treatment, and may actually be mandated. I suggest you consult an architect or civil engineer familiar with the codes applicable in your area for advice on this matter.

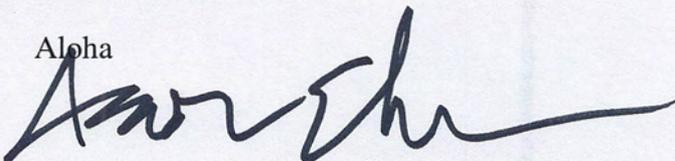
Please send any responses to my comments to:

Aaron Erickson

1348 Alewa Drive

Honolulu, HI. 96817

Alpha



Aaron Erickson



January 25, 2011

Aaron Erickson
1348 Alewa Drive
Honolulu, HI 96717

Dear Mr. Erickson:

Thank you for your letter of January 22, 2011 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. We appreciate your experience and input and hope we can answer you comments to your satisfaction.

- 1) Mauna Kea Moo does not plan to install gates on the cane roads. They will be installed within the property line to direct the cattle and keep them within the confines of the leased parcels. As everyone is undoubtedly aware, liability issues would stop the DLNR as well as Mauna Kea Moo from allowing random access to the property for "indigenous uses." As is written up in most State Land Leases Permission from the lessor and lessee must be obtained, a waiver is signed and proper permits if necessary are obtained access will be allowed. For the safety of employees, other hunters and livestock, Mauna Kea Moo will need to know when hunting is being done and by whom. It would be tragic if cross fire injured or even killed someone. There are paved roads on both sides of the proposed lease parcels that lead to the forest reserves.
- 2) As mentioned in the DEA, Mauna Kea Moo is and will continue to be working with the SWCD as well as the NRCS both agencies committed land management and preservation to. A conservation plan will be drawn up and followed in order to ensure minimal soil erosion and proper pasture management. The SWCD can help with this conservation plan when the lease is secured. A buffer along the gulches is among the guidelines of these agencies and will be implemented.
- 3) If the construction of free stalls becomes necessary for the comfort of the livestock as well as of the control of soil erosion during heavy rains they will be constructed. It is the goal of Mauna Kea Moo not to cause soil erosion or pollute in anyway. With concrete or alternative walkways for the cows to travel to and from the milk barn, rotation of paddocks and not overcrowding this can be done.
- 4) Mauna Kea Moo's objective is to be Natural and as close to organic as possible. The proposed lease land has been fallow sugar cane fields for over 20 years and the Dairy plans to use no artificial fertilizers, herbicides or chemicals. For cleaning the Dairy will use environmental friendly, biodegradable cleansers with the approval of the Health Department which is the mandating agency. No hormones will be used. Keeping in

Mauna Kea Moo, LLC

P.O. Box 461, Papaikou, HI 96781 808-938-9249 or 808-937-4770



mind the health and welfare of the livestock medication will be used if there is no alternative. Again using the governing agencies guidelines, if there is a withdrawal period from production required it will be adhered to.

- 5) Mauna Kea Moo's objective will be to send cull cows which would include cows getting on in years to slaughter. In the unfortunate event that they die on the farm...they will be buried according to standards set by the Department of Health.
- 6) Since Mauna Kea Moo will be a pasture operation 365 days a year and the lactating cows would be in the milk barn for a short period 90% of the waste will be already on the pasture. A digester or methane recovery would not be best management practice. If the animals were confined to a free stall barn then a digester would be practical. The Dairy will have lots of square footage in roofing that will lend itself to solar panels for energy...and wind energy is also something we will research.
- 7) Find attached at the end of this letter a current article in Science Dairy regarding cows and Greenhouse Gas emissions.
- 8) This subject is covered in number 2.
- 9) The planned dairy sight is centered between the 2 gulches and Hwy 19 and the top of the property. This seems like the best location for the Dairy and production facilities. But this has to be ok'd by the planning and health departments.
- 10) The proposed layout of the processing area is just a sketch. The cesspool will not be located in the roadway. A full set of drawings will be drawn up by an architect and the electrical will be done by an electrical engineer, the plumbing by a plumbing engineer and the structural by a structural engineer all overseen by a civil engineer and sent for approval to the Health and Building, Planning Departments.

Again, thank you for your comments, we will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in black ink that reads "Kees CJ Kea". The signature is written in a cursive, flowing style.

Kees CJ Kea
Mauna Kea Moo, LLC

Don't Blame Dairy Cows for (Greenhouse) Gas Emissions, New Study Shows

ScienceDaily (Oct. 19, 2010) — Forget all the tacky jokes about cow flatulence causing climate change. A new study reports that the dairy industry is responsible for only about 2.0 percent of all US greenhouse gas emissions.

The study, led by the University of Arkansas in association with Michigan Technological University, measures the carbon footprint of a gallon of fluid milk from farm to table and uses 2007 and 2008 data from more than 500 dairy farms and 50 dairy processors, as well as data from more than 210,000 round trips transporting milk from farm to processing plant. It was commissioned by the Innovation Center for the US Dairy, an industry-wide group.

The University of Arkansas addressed carbon emissions from the dairy to the milk in your cereal bowl. The Michigan Tech group looked further upstream. "We focused on the carbon footprint of the feed crops," said chemical engineering professor David Shonnard, director of the Sustainable Futures Institute. "Animal feed is a major contributor to carbon emissions." Using US Department of Agriculture data, Shonnard's team, including PhD student Felix Adom and four undergraduates (Ashely Maes, Charles Workman, Zachary Bergmann and Lilian Talla), analyzed the impact of variables ranging from fertilizer and herbicides to harvesting and transportation. "We also looked at a Michigan feed mill, where grain gets combined with any of over a hundred different additives," he said.

The team concluded that the cumulative total emission of greenhouse gases associated with all fluid milk consumed in the US was approximately 35 million metric tons in 2007. While the emissions are lower than sometimes reported, there is still room for improvement for dairy farms and businesses of all kinds, the study concluded. In particular, manure management, feed production and enteric methane (cow gas) were cited as areas that are ripe for innovation on farms. Energy management provides the greatest opportunity in the processing, transportation and retail segments.

The project has also raised other dairy-related issues that Shonnard's group is investigating. They are studying the eutrophication of water -- what happens when nutrients such as manure and fertilizers get into surface water, causing an overbloom of algae that sucks oxygen from the water and kills fish. The team is also investigating water consumption and land use in the dairy industry. "Growing crops is becoming more productive all the time, and we may be able to use less land to satisfy demand," Shonnard said.



A new study by the University of Arkansas and Michigan Tech shows that the dairy industry -- including this Jersey cow -- is responsible for only about 2 percent of all US greenhouse gas emissions. (Credit: Photo by Stephen Kennedy, courtesy of the Innovation Center for the US Dairy)

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Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by [Michigan Technological University](#). The original article was written by Marcia Goodrich.

Need to cite this story in your essay, paper, or report? Use one of the following formats:

- APA

- MLA

Michigan Technological University (2010, October 19). Don't blame dairy cows for (greenhouse) gas emissions, new study shows. *ScienceDaily*. Retrieved January 25, 2011, from <http://www.sciencedaily.com/releases/2010/10/101018163743.htm>

Note: If no author is given, the source is cited instead.

Disclaimer: *Views expressed in this article do not necessarily reflect those of ScienceDaily or its staff.*

NEIL ABERCROMBIE
GOVERNOR



PATRICIA McMANAMAN
INTERIM DIRECTOR

PANKAJ BHANOT
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
Benefit, Employment & Support Services Division
820 Millilani Street, Suite 606
Honolulu, Hawaii 96813

January 20, 2011

Refer to 10:0850

Mr. Gordon C. Heit
Dept. of Land and Natural Resources
Land Division
75 Aupuni Street, Room 204
Hilo, Hawaii 96720

Dear Mr. Heit:

Thank you for your letter dated November 22, 2010. Your letter was referred to me by the Director of the Department of Human Services (DHS).

We have reviewed the Draft Environmental Assessment prepared for the project Mauna Kea Moo. LLC Long Term Lease for dairying purpose, TMK 3rd/4-1-04:33 and TMK 3rd/4-2-07:02 on the island of Hawaii, District 2.

Upon completion of the review of the applicant's proposed project, we do not have any comments or recommendations to the project. We, also, do not foresee any impact on any child care services in the community at this time.

If you have any questions or need further information, please contact Ms. Marja Leivo, Child Care Program Specialist, at (808) 586-7112.

Sincerely,

Luanne Murakami
Acting Division Administrator

c: Patricia McManaman, Interim Director, Department of Human Services
✓ Malena Kea, Consultant, Mauna Kea Moo LLC



January 25, 2011

Ms. Luanne Murakami/Acting Division Administrator
State of Hawaii, Department of Human Services
Benefit, Employment & Support Services Division
820 Mililani Street, Suite 606
Honolulu, HI 96713

Dear Ms. Murakami:

Thank you for your response letter of November 29, 2010 addressing the DEA that we prepared for the long term lease of TMK (3)4-1-004:033 and TMK (3)4-2-007:002 Hamakua, Hawaii. We will be sure and contact Captain Mitchell Kanehailua, Commander of the North Hilo and Hamakua Districts if we have any questions .

We will forward a copy of our final Environmental Assessment upon completion of the 30 day comment period with any revisions and attachments.

Sincerely,

A handwritten signature in blue ink that reads "Kees CJ Kea". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Kees CJ Kea
Mauna Kea Moo, LLC