STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

January 28, 2016
Honolulu, Oahu

Ka'ala Ranch, LLC
APPLICATION FOR GROUND WATER USE PERMIT
Pietsch Well (Well No. 3-3307-030), TMK (1) 6-7-003:009, GWUPA No. 01013
New Domestic, Agricultural, and Irrigation Use Totaling 0.462 mgd
and
APPLICATIONS FOR WELL CONSTRUCTION/PUMP INSTALLATION PERMIT
Pietsch Well (Well No. 3-3307-030)
Mokuleia Ground Water Management Area, Oahu

APPLICANT:

Ka'ala Ranch, LLC
P.O. Box 2196
Honolulu, HI 96805

LANDOWNER:

Ka'ala Ranch, LLC
P.O. Box 2196
Honolulu, HI 96805

SUMMARY OF REQUEST:

The applicant requests that the Commission approve a ground water use permit for an allocation of 0.462 mgd for the Pietsch Well, for potable basal ground water from a new well to supply 6 dwelling units; stockwater for cattle; and irrigation of 40 acres each of avocado, coffee, citrus, and lychee. The applicant has identified, applied for, but has not yet been permitted to construct the well source for this water use permit application.

LOCATION MAP: See Exhibit 1

BACKGROUND:

October 22, 2015 — Michael Pietsch, representing the applicant Ka'ala Ranch LLC, filed a completed new ground water use permit application and a well construction/pump installation permit application.

November 23, 2015 — Public notice was issued concerning the ground water use permit application and the well construction/pump installation review was circulated. The water use application announcement was published November 25 and December 2, 2015, with a comment/objection deadline of December 16, 2016.

Approved by Commission on
Water Resource Management
at the meeting held on
1.28.16

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December 4, 2016 Because the 90-day processing deadline of January 20, 2016 could not be met for this meeting, the applicant waived the 90-day processing deadline.

WATER USE PERMIT

ANALYSIS/ISSUES:

Section 174C-49(a) of the State Water Code establishes seven (7) criteria that must be met to obtain a water use permit. An analysis of the proposed permit in relation to these criteria follows:

(1) Water availability

Through the Hawaii Water Plan, the Commission has adopted 8 mgd as the sustainable yield for the Mokuleia Aquifer System Area. Individual existing water use permits in this aquifer system area are shown in Exhibit 2. A summary of the current ground water allocation conditions in the aquifer is provided in Table 1 below:

Table 1. Summary of Mokuleia Aquifer System Area Allocations

ITEM	Mokuleia Aquifer System Area (mgd)
Sustainable Yield	**8**
Less: Other Existing Water Use Permits (shown in Exhibit 2a)	7.170
Reservation to DHHL	**0**
Subtotal (Current Available Allocation)	**0.830**
Less: Other Completed Applications (shown in Exhibit 2b)	0.277
Less: This Application:	0.462
Subtotal (Potential Available Allocation/Allocation Deficit)	**0.091**

Therefore, there is currently adequate ground water available to accommodate this request.

However, it should be noted, as shown in Exhibit 2b, there are other pending but incomplete ground water use permit applications that total 3.000 mgd. This 3.0 mgd would significantly exceed the available amount of 0.091 should this application for Ka'ala Ranch and other completed pending applications be approved.

Staff believes this appearance of future inadequate water is false for the following reasons:

1) These incomplete pending applications are actually modifications to existing WUPs 777, 779, & 813 that already account for a total of 2.850 mgd so the potential additional increase is actually only 0.150 mgd at this time. These incomplete applications were only recently changed from 2.000 mgd to 3.000 mgd and may change further (either increase or decrease);

2) The actual reported 12-MAV pumpage, as shown in Exhibits 2a & 2c , is only 0.484 mgd. This results in 6.696 mgd of unused allocation;

3) The Commission consultant hired to do outreach to train all well owners in the Mokuleia Water Management Area for on-line water use reporting has completed training for all but a single individual domestic well owner and the Mokuleia Aquafarm (GWUP No. 446 for 0.250 mgd) as of the writing of this submittal;

4) Reporting for all wells in the Mokuleia Ground Water Management Area is at an overall 65% (50 of 77) with 92% (36 of 39) of production wells and 37% (14 of 38) of unused wells reporting;

5) Although the Honolulu Board of Water Supply's Draft North Shore Watershed Management Plan does not break down 20-year future growth demands for the Mokuleia Aquifer System Area, it does not foresee any significant 20-year growth for the entire North Aquifer Sector Area.

Staff has been and continues planning on performing an aquifer wide review for revocation purposes similar to what was done in the neighboring Waialua Ground Water Management Area from 2011 to 2013. This will help to reconcile actual uses and required allocations in this management area and avoid future appearances of potential inadequate water for future applications. The pending incomplete groundwater use permit applicant (North Shore Water Company, LLC) has also recently sealed an abandoned well at staff's request.

(2) Reasonable-beneficial

Section 174C-3 HRS defines "reasonable-beneficial use" is

"*...the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest*".

I. Purpose of Use

The applicant is requesting the use of potable ground water for domestic use in six future dwellings and six other associated farm structures; for supplying stockwater to 100 cattle; for irrigating 40 acres each of avocado, coffee, citrus, and lychee; and for irrigating 1.5 acres of turf. These are considered domestic, agricultural, and irrigation uses of water. The Declaration of Policy section, §174C-2(c) HRS, states that the Water Code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for various purposes including industrial and irrigation uses.

II. Quantity Justification

The applicant is requesting a total of **0.462** mgd for multiple agriculture zone uses: domestic, farm structures, livestock, and fruit tree crops. The breakdown of the request is as follows:

Description	TMK	State Land Use Districts	Zoning	New/Existing	Units or Net Acreage	Duty GPD/Unit or GPD/Acre	Quantity of Use (GPD)
Crops AGRCP	(1) 3-7-003:005	AG	Ag-2	New	160.0	2,800	448,000
Turf AGRLI	(1) 6-7-003:005	AG	Ag-2	New	1.5	2,000	3,000
Livestock (Cattle) AGRLI	(1) 6-7-003:005	AG	Ag-2	New	100.0	50	5,000
Ranch Houses Domestic DOMCB	(1) 6-7-003:005	AG	Ag-2	New	6.0	500	3,000
Farm & Ranch Structures DOMN	(1) 6-7-003:005	AG	Ag-2	New	6.0	500	3,000
				Total Units:	273.5	**Total GPD:**	462,000

The total water requirement should be larger per acre in the beginning during the grow-in period, and it will take a while before the entire proposed acreage will be in production. Over the course of several years, the total amount of use should stabilize.

Staff uses an Irrigation Water Requirement Estimation Decision Support System (IWREDDS), produced under contract to the UH College of Tropical Agriculture and Human Resources (UH-CTAHR), to review the justification for irrigation quantities requested. IWREDSS compares a composite of the latest parcel-specific rainfall, evapotranspiration (ET), soil types, along with the proposed crop type and irrigation methods.

IWREDDS was run for the three crops indicated for the project under trickle drip irrigation: avocado, coffee, citrus, and lychee. The output is attached as Exhibit 3. The model shows that about two-thirds of the soil types for this parcel are those considered weathered, well-drained, with heavy minerals and with stony spots, slightly acidic, with moderate erodability and permeability. These are used mainly for pasture, as has been the history in this location. The remaining soil types tend to the more strongly acidic and more gravelly, including those areas of this parcel that are steeper and dissected by gulches.

UH-CTAHR recommends the IWREDSS 80 percentile, or one-in-five year drought, requirement as a reasonable estimate. The one in five year for avocado came to 2,211 gallons per acre per day (gad). coffee required 2,375 gad; citrus required 2,369 gad, and lychee 2,019 gad, somewhat less than the applicant's proposed use (see Exhibit 3). Turf required 2,368 gad, a bit more. Given Mokuleia wind and solar conditions and the variability of microclimates, the proposed amounts represent reasonable caution. The recommended allocation is subject to actual experience and monitoring via water use reporting.

Multiple domestic needs follow the County Water System Standards (2002) of 500 gpd/unit.

III. Efficiency of Use

The applicant states that its operations are as water efficient as possible with monitoring of the irrigation system to correct leaks and to minimize actual pumping and storage. Trickle-drip irrigation is considered the most efficient use of irrigation.

IV. Analysis of Practical Alternatives

The applicant has identified **5** hypothetical alternatives to the proposed use of potable ground water: municipal, wastewater, surface water and ditch water, and desalting. None of these practical alternatives are available at this location.

The 2000 Legislature amended the Water Code to include a new section, §174C-51.5 HRS that provides the Commission with the authority to require dual line (potable and non-potable) water supply systems in new industrial and commercial developments located in designated water management areas. In this case, the applicant does not have potable water service and is proposing to install only a single potable system. Therefore, this provision does not need to be invoked.

(3) Interference with other existing legal uses

There are 23 other wells currently planned, constructed, or in use within 1 mile of this source. Only six are in use, which uses water for domestic and irrigation needs. The nearest existing well is over 2,000 feet away to the east while 3 permitted individual but unconstructed domestic wells are just under 1,000 feet away to the east. Drilling logs for these wells show that they draw from the Waianae lavas at a distance of one mile, several are in proximity with each other, very close to the boundary of the Mokuleia and Waialua Aquifer System Areas, and at the overlap between Waianae and Koolau lavas. Most wells in the area are small individual domestic wells at 50 gpm or less, and little interference is expected.

Public interest

Public interest is defined under §174C-2 - Declaration of policy, as follows:

"*(c) The state water code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for purposes such as domestic uses, aquaculture uses, irrigation and other agricultural uses, power development, and commercial and industrial uses. However, adequate provision shall be made for the protection of traditional and customary Hawaiian rights, the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of waters of the State for municipal uses, public recreation, public water supply, agriculture, and navigation. Such objectives are declared to be in the public interest."*

Positive aspects of the public interest are met by the concurrence of planned use and purposes warranting maximum beneficial use

Protected public interests have not been the subject of any comments nor objections. The surrounding former plantation lands contain some noted historic sites, but no concerns have been raised here. No one has raised a question of wildlife protection nor traditional and customary Hawaiian practices.

Therefore, staff believes these applications **meet** the public interest.

(5) State & county general plans and land use designations

The proposed uses are in the State **Agriculture** District, and the county zoning is **Ag-1 & 2**. Therefore, the proposed use is consistent with these land use designations.

Normal agency review includes:

1) the State's Department of Land and Natural Resources (DLNR) and its State Parks, Aquatic Resources, Historic Preservation, and Land Divisions; the Department of Health (DOH) with its Clean Water, Safe Drinking Water, and Wastewater Branches; the Department of Hawaiian Home Lands (DDHL), and Land Use Commission (LUC); and the Office of Hawaiian Affairs (OHA).
2) the Office of the Mayor, Department of Planning and Permitting and the Department/Board of Water Supply;

No comments or objections have been made through this review with the exception of DHHL as discussed under criteria (7). These proposed uses are consistent with the state and county general plans and land use designations.

Therefore, staff believes these applications meet the state & county general plans and land use designations.

(6) County land use plans and policies

Again, normal County review includes Office of the Mayor, Department of Planning and Permitting, and the Department/Board of Water Supply. No comments or objections have been made.

Therefore, staff believes these applications meet the county land use plans and policies.

(7) Interference with Hawaiian home lands rights

All permits are subject to the prior rights of Hawaiian home lands. The Department of Hawaiian Home Lands (DHHL) has reiterated the caveat that all areas are subject to future claims of DHHL for foreseeable needs, by way of water reservations or service from municipal sources. These future potentials are not reflected in DHHL's foreseeable needs from this area in the State Water Projects Plan of the Hawaii Water Plan.

Nonetheless, standard water use permit conditions 3.g., 6., and 9.f. notify all water use permittees that their permits are subject to and cannot interfere with Hawaiian home land rights. Should a conflict arise the future, the Commission retains the responsibility and the capability of adjusting the permitted allocations to this and other water use permittees.

Therefore, staff believes these applications will not interfere with Hawaiian home lands rights.

(8) Other issues

I. Chapter 343 – Environmental Assessment (EA) Compliance

EA Triggers
In accordance with §HRS 343-5(a), the applicant's proposed action does not trigger the need for an environmental assessment (EA). There are no State or county lands or funds involved, no shoreline setback or special management area, special design district, power stations, etc., that would otherwise require the particular scrutiny of an EA.

WELL CONSTRUCTION AND PUMP INSTALLATION PERMITS

ANALYSIS/ISSUES:

The well and pump permit applications for the Pietsch Well (Well No. 3-3307-030) have been accepted as complete and circulated to the standard list of agencies (Department of Health programs, County Planning – SMA programs, and DLNR – State Historic Preservation Division) for their review according to their jurisdictions. The review comment deadline was December 26, 2015, standard comments have been received; and no objections nor other concerns were raised.

Through past Declaratory Rulings DEC-ADM92-G0 & DEC-ADM94-G2 (Exhibits 4 & 5), the Commission has allowed wells to be constructed in a ground water management area before a water use permit is issued. This was to allow real measureable information to be available to the Commission if and when a water use permit came later. However, pump installation permits have not and are not allowed prior to the approval of a ground water use permit.

This bifurcation of well and pump installation permit approach is used to address what has been called the "reliance" issue. The reliance issue arises from the risk assumed by an applicant when constructing a well in a ground water management area (GWMA). In a GWMA, applicants have been allowed the option of drilling a well with the express understanding that they cannot rely on the approval of a well construction permit to guarantee a future allocation. This provides the Commission with the benefit of a pump test at the construction stage to serve their decision-making with the best information on a proposed source. If pump tests from the well construction permit show no adverse impacts to existing resources then the Commission is in a better position to approve the ground water use permit. A subsequent a pump installation permit could then be administratively approved either at the same Commission meeting or administratively.

However, as in this case, it is an option and choice of the applicant to request a 'new' ground water use permit before a source is fully vetted. The Commission has approved ground water use permits before a source has been constructed in the past, with the understanding that the construction and pump installation details are subject to normal compliance with the Hawaii Well Construction and Pump Installation Standards; specifically, the hydrologic information observed during normal construction and testing requirements.

RECOMMENDATION:

Staff recommends that the Commission:

A. Approves the issuance of water use permits to Ka'ala Ranch, LLC for reasonable and beneficial use of 0.462 mgd of potable ground water from the Pietsch Well (Well No. 3307-030); subject to the standard water use permit conditions listed in Attachment B and the following special conditions:

    1. Should an alternate permanent source of water be found for this use, then the Commission reserves the right to revoke this permit, after a hearing.

2. In the event that the tax map key at the location of the water use is changed, the permittee shall notify the Commission in writing of the tax map key change within thirty (30) days after the permittee receives notice of the tax map key change.

B. Approves the Well Construction Permit for the Pietsch Well (Well No. 3-3307-030) subject to the standards conditions in attachments C.

C. Defers and delegates to staff the approval of the Pump Installation Permit for the Pietsch Well (Well No. 3-3307-030), subject to the compliance with the Hawaii Well Construction and Pump Installation Standards; specifically, the results of the pump testing requirements. The Pump Installation Permit will be subject to standards conditions in attachments D, and any special conditions deemed necessary by staff relative to the construction and pump test results in protecting the resource or neighboring wells.

Respectfully submitted,

JEFFREY T. PEARSON, P.E.
Deputy Director

Attachment(s): A (Water Use Permit Detailed Information)
B (Water Use Permit Standard Conditions)
C (Well Construction Permit Standard Conditions)
D (Pump Installation Permit Standard Conditions)

Exhibit(s): 1 (Location Map)
2a-c (Existing Water Use Permits and Current 12-Month Moving Average Withdrawal; Pending Water Use Permit Applications, and Historic Pumpage)
3 (IWREDSS model printout for Ka'ala Ranch proposed crops)
4 (DEC-ADM92-G0)
5 (DEC-ADM94-G2)

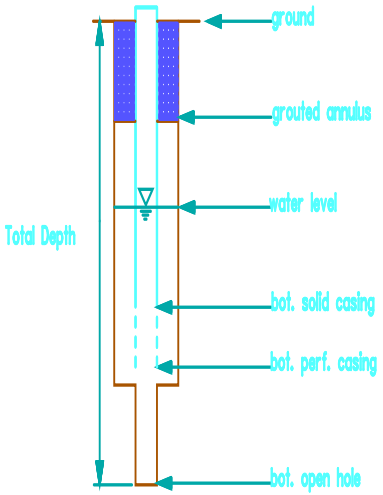
APPROVED FOR SUBMITTAL:

SUZANNE D. CASE
Chairperson

WATER USE PERMIT DETAILED INFORMATION

Source Information

AQUIFER:	Mokuleia System, North Sector, Oahu
Sustainable Yield:	8 mgd
Existing Water Use Permits:	0.917 mgd
Available Allocation:	6.806 mgd
Total other pending applications:	0.265 mgd
This application:	0.462 mgd
PROPOSED WELL:	(Well No. 3-3307-030)
Location:	Mokuleia, Oahu, TMK: (1) 6-7-003:005
Year Drilled:	Future
Casing Diameter:	10 in.
Elevations (msl= 0 ft.)	
Water Level:	11 ft.
Ground:	134 ft.
Bottom of Solid Casing:	-46 ft.
Bottom of Perforated:	-66 ft.
Bottom of Open Hole:	-66 ft.
Total Depth:	200 ft.
Grouted Annulus Depth:	**100** ft.
Pump Capacity	350 gpm



Use Information

Quantity Requested:	0.462 gallons per day.
New Type of Water Use:	domestic, agriculture, crop irrigation
Place of Water Use:	TMK: (1) 6-7-003:005

Mokuleia Aquifer System Area
Current 12-Month Moving Average Withdrawal (See Exhibit 2): 0.484 mgd

Nearby Surrounding Wells and Other Registered Ground Water Use

There are 23 other wells constructed or planned within a mile of the well (see Exhibit 1). 6 of these wells are currently in use. Information from the registration program indicates there are 77 existing wells in the Mokuleia Aquifer System Area. These wells have been initially field checked but many of the declarants, including the larger users, have not been completely field verified. Several are not in use or are rights claims. From the field verification, estimated existing ground water use from the Mokuleia Aquifer System is approximately 0.484 mgd.

Public Notice

In accordance with HAR §13-171-17, a public notice was published in the Honolulu Star Advertiser on **November 25, 2015 and December 2, 2015** and a copy of the notice was sent to the Office of the Mayor. Copies of the completed application were sent to the Department of Planning and Permitting, Department of Health, Department of Hawaiian Home Lands, Office of Hawaiian Affairs, the various divisions within the Department of Land and Natural Resources, and other interested parties for comments. Written comments and objections to the proposed permit were to be submitted to the Commission by **December 16, 2015.**

Objections

The public notice specifies that an objector meet the following requirements: (1) state property or other interest in the matter; (2) set forth questions of procedure, fact, law, or policy, to which objections are taken; (3) state all grounds for objections to the proposed permits, (4) provide a copy of the objection letter(s) to the applicant, and (5) submit objections meeting the previous requirements to the Commission by **December 16, 2015**.

To the best of staff's knowledge there are no objectors who have property interest within the Mokuleia Aquifer System Area or who will be directly and immediately affected by the proposed water use.

Briefs in Support

Responses to objections, or briefs in support, regarding the application are required to be filed with the Commission ten (10) days after an objection is filed and, presumably, copies are served to the applicant. No briefs in support were filed with the Commission.

STANDARD WATER USE PERMIT CONDITIONS

1. The water described in this water use permit may only be taken from the location described and used for the reasonable beneficial use described at the location described above. Reasonable beneficial uses means "the use of water in such a quantity as is necessary for economic and efficient utilization which is both reasonable and consistent with State and County land use plans and the public interest." (HRS § 174C-3)

2. The right to use ground water is a shared use right.

3. The water use must at all times meet the requirements set forth in HRS § 174C-49(a), which means that it:

    a. Can be accommodated with the available water source;
    b. Is a reasonable-beneficial use as defined in HRS § 174C-3;
    c. Will not interfere with any existing legal use of water;
    d. Is consistent with the public interest;
    e. Is consistent with State and County general plans and land use designations;
    f. Is consistent with County land use plans and policies; and
    g. Will not interfere with the rights of the Department of Hawaiian Home Lands as provided in section 221 of the Hawaiian Homes Commission Act and HRS § 174C-101(a).

4. The ground water use here must not interfere with surface or other ground water rights or reservations.

5. The ground water use here must not interfere with interim or permanent instream flow standards. If it does, then:

    a. A separate water use permit for surface water must be obtained in the case an area is also designated as a surface water management area;
    b. The interim or permanent instream flow standard, as applicable, must be amended.

6. The water use authorized here is subject to the requirements of the Hawaiian Homes Commission Act, as amended, if applicable.

7. The water use permit application and submittal, as amended, approved by the Commission at its January 28, 2016 meeting are incorporated into this permit by reference.

8. Any modification of the permit terms, conditions, or uses may only be made with the express written consent of the Commission.

9. This permit may be modified by the Commission and the amount of water initially granted to the permittee may be reduced if the Commission determines it is necessary to:

    a. protect the water sources (quantity or quality);
    b. meet other legal obligations including other correlative rights;
    c. insure adequate conservation measures;

d. require efficiency of water uses;
e. reserve water for future uses, provided that all legal existing uses of water as of June, 1987 shall be protected;
f. meet legal obligations to the Department of Hawaiian Home Lands, if applicable; or
g. carry out such other necessary and proper exercise of the State's and the Commission's police powers under law as may be required.

Prior to any reduction, the Commission shall give notice of its proposed action to the permittee and provide the permittee an opportunity to be heard.

10. An approved flowmeter(s) **need not** be installed to measure monthly withdrawals and a monthly record of withdrawals, salinity, temperature, and pumping times must be kept and reported to the Commission on Water Resource Management on forms provided by the Commission on a **monthly** basis.

11. This permit shall be subject to the Commission's periodic review of the Mokuleia Aquifer System Area's sustainable yield. The amount of water authorized by this permit may be reduced by the Commission if the sustainable yield of the Mokuleia Aquifer System Area, or relevant modified aquifer(s), is reduced.

12. A permit may be transferred, in whole or in part, from the permittee to another, if:

a. The conditions of use of the permit, including, but not limited to, place, quantity, and purpose of the use, remain the same; and
b. The Commission is informed of the transfer within ninety days.

Failure to inform the department of the transfer invalidates the transfer and constitutes a ground for revocation of the permit. A transfer which involves a change in any condition of the permit, including a change in use covered in HRS § 174C-57, is also invalid and constitutes a ground for revocation.

13. The use(s) authorized by law and by this permit do not constitute ownership rights.

14. The permittee shall request modification of the permit as necessary to comply with all applicable laws, rules, and ordinances which will affect the permittee's water use.

15. The permittee understands that under HRS § 174C-58(4), that partial or total nonuse, for reasons other than conservation, of the water allowed by this permit for a period of four (4) continuous years or more may result in a permanent revocation as to the amount of water not in use. The Commission and the permittee may enter into a written agreement that, for reasons satisfactory to the Commission, any period of nonuse may not apply towards the four-year period. Any period of nonuse which is caused by a declaration of water shortage pursuant to section HRS § 174C-62 shall not apply towards the four-year period of forfeiture.

16. The permittee shall prepare and submit a water shortage plan within 30 days of the issuance of this permit as required by HAR § 13-171-42(c). The permittee's water shortage plan shall identify what the permittee is willing to do should the Commission declare a water shortage in the Mokuleia Ground Water Management Area.

17. The water use permit shall be subject to the Commission's establishment of instream standards and policies relating to the Stream Protection and Management (SPAM) program, as well as legislative mandates to protect stream resources.

18. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

19. The permittee understands that any willful violation of any of the above conditions or any provisions of HRS § 174C or HAR § 13-171 may result in the suspension or revocation of this permit.

STANDARD WELL CONSTRUCTION PERMIT CONDITIONS

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules (HAR).

2. This permit shall be prominently displayed, or made available, at the site of construction work until work is completed.

3. The well construction permit shall be for construction and testing of the well only. The permittee shall coordinate with the Chairperson and conduct a pumping test in accordance with the HWCPIS (the latest pump test worksheet can be obtained by contacting Commission staff or at http://files.hawaii.gov/dlnr/cwrm/forms/APTR.pdf). The permittee shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson. No withdrawal of water shall be made for purposes other than testing without a Certificate of Pump Installation Completion. The permitted pump capacity described on the pump installation permit **may be reduced** in the event that the pump test does not support the capacity.

4. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson. If it can be shown that the well does not tap basal ground water then this condition may be waived after consultation with and acceptance by Commission staff. However, in no instance can the well be drilled deeper than one-half (1/2) of the theoretical thickness without Commission approval.

5. The permittee shall incorporate mitigation measures to prevent construction debris from entering the aquatic environment, to schedule work to avoid periods of high rainfall, and to revegetate any cleared areas as soon as possible.

6. In the event that historically significant remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee shall stop work and immediately contact the Department of Land and Natural Resources' State Historic Preservation Division. Work may recommence only after written concurrence by the State Historic Preservation Division.

7. The proposed well construction shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of correlative water rights.

8. The Well Completion Report Part I shall be submitted to the Chairperson within sixty (60) days after completion of work (please contact staff or visit http://files.hawaii.gov/dlnr/cwrm/forms/WCR1.pdf for current form).

9. The permittee shall comply with all applicable laws, rules, and ordinances; non-compliance may be grounds for revocation of this permit.

10. The well construction permit application and, if relevant, any related staff submittal approved by the Commission are incorporated into this permit by reference.

11. If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

12. Any variances from the HWCPIS shall be approved by the Chairperson prior to invoking the variance.

13. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than the date the permit expires.

14. If the well is not to be used it must be properly capped. If the well is to be abandoned during the course of the project then the permittee must apply for a well abandonment permit in accordance with §13-168-12(f), HAR, prior to any well sealing or plugging work.

15. The permittee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.

16. This permit shall apply to the location shown on the application only. If the well is to be relocated, the permittee shall apply for a new well construction/pump installation permit in accordance with §13-168-12(f), HAR.

17. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

STANDARD PUMP INSTALLATION PERMIT CONDITIONS

1. The Chairperson to the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work covered by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules (HAR).

2. No withdrawal of water shall be made other than for testing until a Certificate of Pump Installation Completion has been issued by the Commission.

3. This permit shall be prominently displayed, or made available, at the site of construction work until work is completed.

4. The pump installation permit shall be for installation of a **TBD** gpm rated capacity, or less, pump in the well (**after normal pump testing in accordance with the Hawaii Well Construction and Pump Installation Standards is completed and accepted by staff**). This permanent capacity may be reduced in the event that the pump test data does not support the capacity.

5. A water-level measurement access shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels.

6. The permittee shall install an approved meter or other appropriate means for measuring and reporting withdrawals and appropriate devices or means for measuring chlorides and temperature at the well head.

7. Well Completion Report Part II shall be submitted to the Chairperson within sixty (60) days after completion of work (please contact staff or visit **http://files.hawaii.gov/dlnr/cwrm/forms/WCR2.pdf** for current form).

8. The permittee, well operator, and/or well owner shall comply with all applicable laws, rules, and ordinances, and non-compliance may be grounds for revocation of this permit.

9. The pump installation permit application and, if relevant, any related staff submittal approved by the Commission are incorporated into this permit by reference.

10. If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

11. Any variances from the HWCPIS shall be approved by the Chairperson **prior** to invoking the variance.

12. The work proposed in the pump installation permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than the date the permit expires.

13. The permittee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.

14. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

Well Location - Exhibit 1

Commission on Water Resource Management

Water Use Permit

Report Parameters

Island:	Oahu
Applicant or Source Landowner:	All
Well # Prefix:	All
Date:	All
Aquifer:	30401 Mokuleia
TMK:	All
Aquifer Type:	All
Water Quality:	All
Not Proposed Use:	None

WUP = Water Use Permit, 12-MAV = 12 month moving average, Diff = WUP-12-MAV, mgd = million gallons per day

Island of Oahu

Aquifer System Ground Water Management Area: 30401 Mokuleia

Sustainable Yield (mgd): 8

WUP No	Approved	Permittee	Well No	Well Name	WUP (mgd)	12-MAV (mgd)	Diff (mgd)	Date Last Reported
38	09/11/1981	United States Air Force	3-3314-003	USAF Kaena Point	0.018	0.000	0.018	12/31/2015
49	06/02/1993	Waialua Sugar Company, Inc.	3-3409-013	Pump 11	0.530			08/31/2015
52	06/02/1993	Waialua Sugar Company, Inc.	3-3411-004	Pump 5	2.550	0.179	2.371	09/30/2015
			3-3411-006	Pump 5				09/30/2015
			3-3411-007	Pump 5				09/30/2015
			3-3411-008	Pump 5				09/30/2015
			3-3411-009	Pump 5				09/30/2015
			3-3411-010	Pump 5				09/30/2015
			3-3411-011	Pump 5				09/30/2015
			3-3411-013	Pump 5				09/30/2015
53	09/11/1981	Directorate of Public Works, Environmental Div., DPW, U.S. Army Garrison	3-3412-002	Dillingham Airfield	0.055	0.125	-0.070	10/05/2015
446	10/23/1996	Mokuleia Aquafarm	3-3409-024	MAF 1	0.250			
606	01/30/2002	C&C DOE	3-3407-025	Waialua HS	0.039	0.004	0.035	06/30/2015
669	02/18/2004	Hawaii Fish Company Inc	3-3412-004	Hawaii Fish Co. 1	0.576	0.003	0.573	11/30/2015
679	01/13/2004	KAALA RANCH	3-3309-002	Mokuleia	0.127	0.011	0.116	08/12/2015
766	07/12/2006	Mark Hamamoto (Mohala Farms)	3-3306-016	Hamamoto 2006	0.013	0.002	0.011	09/30/2015
777	12/14/1988	Dillingham Ranch Aina LLC	3-3310-002	Mokuleia 2	0.850	0.000	0.850	12/31/2015
779	09/11/1981	Dillingham Ranch Aina LLC	3-3410-003	Shop Well	1.500	0.064	1.436	12/31/2015
813	09/11/1981	North Shore Water Company, LLC	3-3410-001	Crowbar Ranch	0.500	0.090	0.410	10/31/2015
941	09/17/2003	Stanhope Farms	3-3308-002	Stanhope Farms	0.056	0.006	0.050	12/15/2015
984	08/11/2015	Kealia Farms	3-3412-006	Kealia Farms	0.009			10/01/2015
999	09/16/2015	Candace Chase	3-3208-001	Chase	0.068			
1,002	09/16/2015	Kalea Properties LLC	3-3308-003	Kalea 2012	0.029	0.000	0.029	10/21/2015
Summary for Mokuleia (23 detail records)				**Total:**	7.170	0.484	6.686	
				SY Available:	0.830			

Commission on Water Resource Management
Information Management System

Pending Water Use Applications

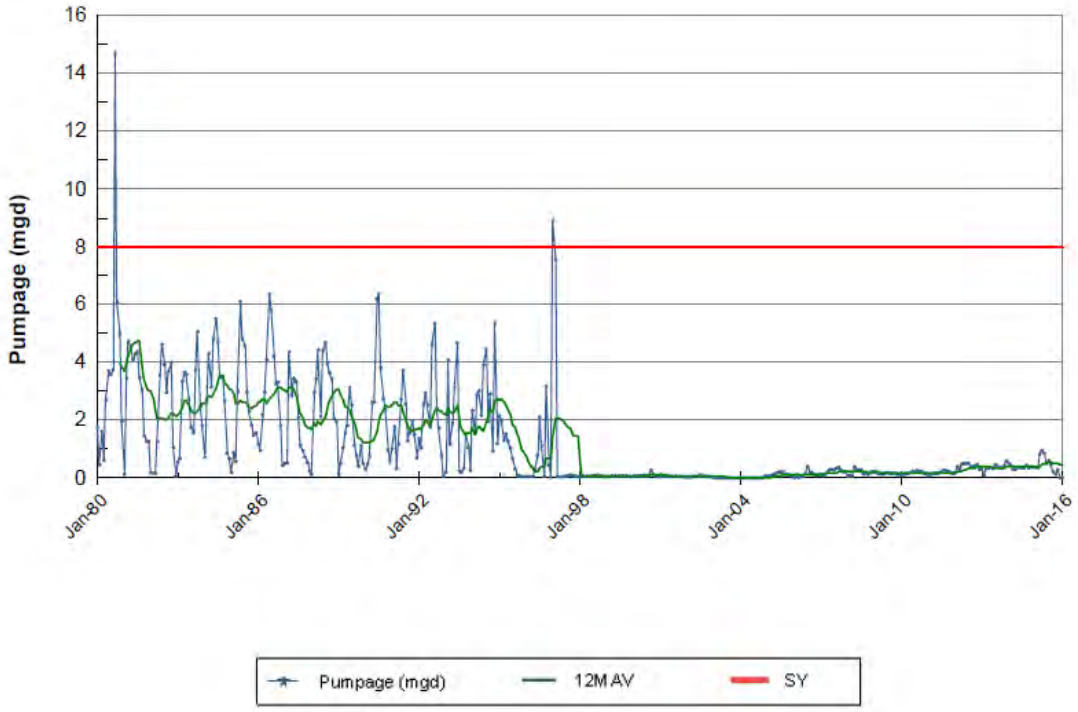
WUPA No	Well No.	Applicant	Well Name	mgd	Received	Accept
Aquifer System: 30401 Mokuleia						
1,003	3-3410-001	North Shore Water Company, LLC	Crowbar Ranch	1.709	07/02/2015	
1,003	3-3410-003	North Shore Water Company, LLC	Shop Well		07/02/2015	
1,004		North Shore Water Company, LLC	Well 1	1.300	07/02/2015	
1,004		North Shore Water Company, LLC	Well 2		07/02/2015	
1,010	3-3308-007	G Tree Ranch, LLC	G Tree	0.066	09/25/2015	09/25/2015
1,011	3-3307-026	G Tree Ranch, LLC	Paty	0.130	09/25/2015	09/25/2015
1,012	3-3307-019	G Tree Ranch, LLC	Waialua-Mauka	0.081	09/25/2015	09/25/2015
1,013	3307-030	Ka'ala Ranch LLC	Pietsch	0.462	10/22/2015	10/22/2015
				6 WUPAs totalling 3.748		

Number of Wells: 8

Mokuleia Ground Water Management Area

Commission on Water Resource Management
Information Management System

Monthly Pumpage Chart
12 Month Moving Average



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*******************************************************
*                      SUMMARY                        *
*******************************************************
TMK  : 67003005
SOILS: Halawa(0.052), Halawa(0.172), Kawaihapai(0.034), Kemoo(0.211), Kemoo(0.317), Kemoo(0.109), Waialua(0.030),
       Stony steep land(0.020), Tropohumults(0.054)
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ANNUAL IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
25.6	30.2	819.2	41.6	33.3	22.9	25.5	5.5	2.8	50.0	48.6	10.5

GIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	30.169	29.656	45.315	18.515	30.493	34.962	37.057	38.676
	Thou. gpd/acre	2.244	2.206	3.371	1.377	2.269	2.601	2.757	2.877
249.12	Total thou. gpd	279.568	274.816	419.924	171.575	282.572	323.983	343.395	358.403

NIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	25.644	25.208	38.518	15.738	25.919	29.718	31.498	32.875
	Thou. gpd/acre	1.908	1.875	2.866	1.171	1.928	2.211	2.343	2.446
249.12	Total thou. gpd	237.633	233.594	356.936	145.839	240.187	275.386	291.886	304.642

Kaala Ranch
avocado

Note:- Irrigated area for the selected TRICKLE, DRIP irrigation system is 0.5 of the total area

MONTHLY IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

MO	NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
1	0.5	0.6	16.0	7.4	5.8	2.8	4.1	1.3	0.3	3.1	2.9	3.0
2	0.4	0.5	13.4	5.1	4.1	2.4	2.9	0.7	0.2	3.2	3.0	1.7
3	1.2	1.4	38.2	4.6	3.8	2.4	2.8	0.5	0.2	4.1	3.8	1.4
4	1.5	1.8	49.5	3.2	2.7	2.1	2.1	0.3	0.3	4.4	4.1	0.6
5	2.7	3.1	84.9	1.9	1.5	1.3	1.3	0.2	0.2	5.0	4.8	0.2
6	3.4	4.0	109.3	1.0	0.8	0.8	0.7	0.0	0.2	5.0	5.0	0.0
7	3.8	4.5	122.5	1.5	1.1	1.1	1.1	0.1	0.2	5.1	5.1	0.0
8	3.6	4.2	115.2	1.4	1.1	1.1	1.0	0.1	0.2	5.1	5.1	0.0
9	3.4	4.0	109.2	1.4	1.2	1.1	1.0	0.1	0.2	4.7	4.7	0.1
10	2.9	3.4	91.3	3.3	2.5	2.2	2.0	0.6	0.2	4.1	4.1	0.3
11	1.4	1.6	43.8	4.8	3.8	2.8	2.8	0.7	0.3	3.1	3.1	1.0
12	0.8	1.0	26.0	6.1	4.9	2.7	3.5	0.9	0.3	2.9	2.9	2.2

GIR STATISTICS

MO	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
1	0.6	0.0	3.5	0.0	0.0	0.0	0.0	0.0
2	0.5	0.0	3.6	0.0	0.0	0.0	0.0	0.0
3	1.4	0.1	3.6	0.0	0.0	0.0	0.0	0.0
4	1.8	1.3	4.1	0.0	0.0	0.0	0.0	0.0
5	3.1	3.5	7.1	0.0	0.1	0.1	0.1	0.1
6	4.0	3.5	7.1	0.0	1.1	1.4	1.4	1.4
7	4.5	3.5	7.1	2.3	1.7	2.1	2.2	2.2
8	4.2	3.5	7.1	0.0	1.6	2.0	2.2	2.2
9	4.0	3.5	7.1	0.1	1.0	1.2	1.2	1.2
10	3.4	3.5	7.1	0.0	0.2	0.3	0.3	0.3
11	1.6	0.1	6.9	0.0	0.0	0.0	0.0	0.0
12	1.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0

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*********************************************************
*                         SUMMARY                       *
*********************************************************
TMK  : 67003005
SOILS: Halawa(0.052), Halawa(0.172), Kawaihapai(0.034), Kemoo(0.211), Kemoo(0.317), Kemoo(0.109), Waialua(0.030),
       Stony steep land(0.020), Tropohumults(0.054)
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ANNUAL IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
28.3	33.3	903.9	41.6	30.2	18.2	24.6	5.5	5.9	50.0	46.4	12.6

GIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	33.287	33.115	46.024	21.247	33.684	37.555	39.334	40.694
	Thou. gpd/acre	2.476	2.464	3.424	1.581	2.506	2.794	2.926	3.027
249.12	Total thou. gpd	308.463	306.865	426.492	196.893	312.139	348.012	364.495	377.104

NIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	28.294	28.148	39.120	18.060	28.631	31.922	33.434	34.590
	Thou. gpd/acre	2.105	2.094	2.910	1.344	2.130	2.375	2.487	2.573
249.12	Total thou. gpd	262.194	260.836	362.518	167.359	265.318	295.810	309.821	320.538

Kaala Ranch
coffee

Note:- Irrigated area for the selected TRICKLE, DRIP irrigation system is 0.5 of the total area

MONTHLY IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

MO	NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
1	0.7	0.8	21.1	7.4	5.5	2.3	4.0	1.3	0.6	3.1	2.8	3.2
2	0.8	0.9	25.2	5.1	3.8	2.1	2.8	0.7	0.5	3.2	2.8	1.8
3	1.6	1.8	49.6	4.6	3.6	2.0	2.7	0.5	0.5	4.1	3.6	1.6
4	2.2	2.6	71.2	3.2	2.3	1.6	2.1	0.3	0.6	4.4	4.1	0.8
5	3.2	3.8	102.1	1.9	1.3	1.0	1.3	0.2	0.4	5.0	4.7	0.3
6	3.2	3.7	101.0	1.0	0.7	0.6	0.7	0.0	0.3	5.0	4.8	0.1
7	4.1	4.8	129.7	1.5	0.9	0.8	1.1	0.1	0.4	5.1	4.9	0.1
8	4.0	4.7	126.4	1.4	0.9	0.8	0.9	0.1	0.4	5.1	4.9	0.1
9	3.4	4.0	109.0	1.4	1.0	0.9	1.0	0.1	0.3	4.7	4.5	0.1
10	2.8	3.3	90.1	3.3	2.3	1.6	1.9	0.6	0.4	4.1	3.9	0.7
11	1.7	2.0	53.1	4.8	3.5	2.2	2.7	0.7	0.6	3.1	2.9	1.4
12	0.8	0.9	25.5	6.1	4.6	2.2	3.3	0.9	0.6	2.9	2.7	2.4

GIR STATISTICS

MO	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
1	0.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0
2	0.9	0.0	4.5	0.0	0.0	0.0	0.0	0.0
3	1.8	1.3	4.8	0.0	0.0	0.0	0.0	0.0
4	2.6	3.5	4.8	0.0	0.2	0.2	0.3	0.3
5	3.8	3.5	7.1	0.0	1.3	1.6	1.7	1.7
6	3.7	3.5	7.1	0.0	2.7	3.4	3.7	3.9
7	4.8	4.0	7.1	0.2	4.7	5.8	5.8	5.8
8	4.7	3.5	7.1	0.0	4.6	5.6	5.7	5.7
9	4.0	3.5	7.1	0.0	0.4	0.5	0.5	0.5
10	3.3	3.5	7.1	0.0	0.0	0.0	0.0	0.0
11	2.0	3.5	4.8	0.0	0.0	0.0	0.0	0.0
12	0.9	0.0	3.5	0.0	0.0	0.0	0.0	0.0

SUMMARY

TMK : 67003005
SOILS: Malawa(0.052), Malawa(0.172), Kawaihapai(0.034), Kemoo(0.211), Kemoo(0.317), Kemoo(0.109), Waialua(0.030), Stony steep land(0.020), Tropohumults(0.054)

ANNUAL IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETO	ET	DR
28.7	33.7	916.4	41.6	31.1	11.9	23.6	5.5	5.1	50.0	40.5	30.0

GIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	33.748	33.044	42.424	22.456	34.155	37.461	38.963	40.105
	Thou. gpd/acre	2.511	2.458	3.156	1.671	2.541	2.787	2.899	2.984
249.12	Total thou. gpd	312.728	306.209	393.129	208.090	316.504	347.144	361.058	371.638

NIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	28.685	28.087	36.060	19.087	29.032	31.842	33.118	34.089
	Thou. gpd/acre	2.134	2.090	2.683	1.420	2.160	2.369	2.464	2.536
249.12	Total thou. gpd	265.819	260.277	334.160	176.877	269.028	295.072	306.899	315.893

Kaala Ranch
citrus

Note:- Irrigated area for the selected TRICKLE, DRIP irrigation system is 0.5 of the total area

MONTHLY IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

MO	NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
1	0.6	0.7	20.3	7.4	5.7	1.6	3.7	1.3	0.4	3.1	2.1	5.2
2	0.9	1.1	28.7	5.1	3.9	1.5	2.7	0.7	0.4	3.2	2.3	3.3
3	1.9	2.2	59.8	4.6	3.6	1.3	2.6	0.5	0.5	4.1	3.1	3.5
4	2.6	3.0	82.2	3.2	2.4	1.1	2.0	0.3	0.5	4.4	3.6	2.7
5	3.5	4.1	111.8	1.9	1.3	0.6	1.3	0.2	0.4	5.0	4.2	1.5
6	3.0	3.6	97.0	1.0	0.7	0.4	0.7	0.0	0.3	5.0	4.3	0.7
7	4.1	4.8	129.5	1.5	0.9	0.6	1.0	0.1	0.4	5.1	4.5	0.9
8	4.0	4.7	128.2	1.4	0.9	0.6	0.9	0.1	0.4	5.1	4.5	0.7
9	3.1	3.7	99.2	1.4	1.0	0.7	1.0	0.1	0.3	4.7	4.0	0.8
10	2.8	3.2	88.0	3.3	2.3	0.9	1.9	0.6	0.4	4.1	3.4	2.2
11	1.6	1.8	49.9	4.8	3.6	1.2	2.6	0.7	0.5	3.1	2.5	4.0
12	0.7	0.8	21.8	6.1	4.7	1.4	3.2	0.9	0.5	2.9	2.1	4.4

GIR STATISTICS

MO	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
1	0.7	0.0	4.7	0.0	0.1	0.2	0.2	0.2
2	1.1	0.0	3.5	0.0	0.0	0.0	0.0	0.0
3	2.2	3.5	3.5	0.0	0.0	0.0	0.0	0.0
4	3.0	3.5	7.1	0.0	0.0	0.0	0.0	0.0
5	4.1	3.5	7.1	1.0	0.0	0.0	0.0	0.0
6	3.6	3.5	7.1	0.0	3.8	4.7	5.0	5.0
7	4.8	3.5	7.1	1.3	4.7	5.3	5.3	5.3
8	4.7	3.5	7.1	0.0	4.7	5.3	5.3	5.3
9	3.7	3.5	7.1	0.0	0.0	0.0	0.0	0.0
10	3.2	3.5	7.1	0.0	0.0	0.0	0.0	0.0
11	1.8	1.2	7.0	0.0	0.0	0.0	0.0	0.0
12	0.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0

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*******************************************************
*                     SUMMARY                         *
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TMK : 67003005
SOILS: Halawa(0.052), Halawa(0.172), Kawaihapai(0.034), Kemoo(0.211), Kemoo(0.317), Kemoo(0.109), Waialua(0.030), Stony steep land(0.020), Tropohumults(0.054)

ANNUAL IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
23.1	27.2	737.9	41.6	33.4	22.7	25.3	5.5	2.7	50.0	45.9	10.8

GIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	27.175	26.127	41.751	15.170	27.442	31.922	34.044	35.692
	Thou. gpd/acre	2.022	1.944	3.106	1.129	2.042	2.375	2.533	2.655
249.12	Total thou. gpd	251.824	242.110	386.890	140.577	254.300	295.816	315.472	330.748

NIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	23.099	22.208	35.488	12.895	23.326	27.134	28.937	30.338
	Thou. gpd/acre	1.718	1.652	2.640	0.959	1.735	2.019	2.153	2.257
249.12	Total thou. gpd	214.050	205.794	328.857	119.490	216.155	251.444	268.152	281.136

Kaala Ranch
lychee

Note:- Irrigated area for the selected TRICKLE, DRIP irrigation system is 0.5 of the total area

MONTHLY IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

MO	NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
1	0.5	0.6	17.6	7.4	5.8	2.7	4.1	1.3	0.3	3.1	3.0	3.1
2	0.6	0.7	18.9	5.1	4.1	2.4	3.0	0.7	0.3	3.2	3.2	1.7
3	1.5	1.8	48.5	4.6	3.8	2.5	2.9	0.5	0.3	4.1	4.1	1.3
4	1.8	2.1	56.9	3.2	2.6	2.1	2.2	0.3	0.3	4.4	4.4	0.6
5	2.7	3.2	87.3	1.9	1.5	1.3	1.3	0.2	0.2	5.0	4.7	0.1
6	3.0	3.5	96.2	1.0	0.8	0.8	0.7	0.0	0.2	5.0	4.6	0.0
7	3.4	4.0	108.8	1.5	1.1	1.1	1.1	0.1	0.2	5.1	4.6	0.0
8	3.2	3.7	100.7	1.4	1.1	1.1	0.9	0.1	0.2	5.1	4.4	0.0
9	2.7	3.2	87.6	1.4	1.2	1.1	1.0	0.1	0.1	4.7	3.8	0.1
10	2.2	2.6	70.3	3.3	2.5	2.1	1.9	0.6	0.2	4.1	3.4	0.4
11	0.9	1.1	29.8	4.8	3.8	2.8	2.8	0.7	0.3	3.1	2.9	1.1
12	0.5	0.6	15.3	6.1	4.9	2.7	3.4	0.9	0.3	2.9	2.7	2.2

GIR STATISTICS

MO	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
1	0.6	0.0	3.5	0.0	0.0	0.0	0.0	0.0
2	0.7	0.0	4.4	0.0	0.0	0.0	0.0	0.0
3	1.8	1.0	3.7	0.0	0.1	0.1	0.1	0.1
4	2.1	3.5	7.1	0.0	0.0	0.0	0.0	0.0
5	3.2	3.5	7.1	0.0	0.8	1.0	1.1	1.1
6	3.5	3.5	7.1	0.0	1.3	1.7	1.7	1.7
7	4.0	3.5	7.1	0.0	0.8	1.0	1.0	1.0
8	3.7	3.5	7.1	0.0	0.0	0.0	0.0	0.0
9	3.2	3.5	7.1	0.0	0.1	0.1	0.1	0.1
10	2.6	3.5	4.6	0.0	0.0	0.0	0.0	0.0
11	1.1	0.0	3.6	0.0	0.0	0.0	0.0	0.0
12	0.6	0.0	3.5	0.0	0.0	0.0	0.0	0.0

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* SUMMARY *

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TMK : 67003005

SOILS: Halawa(0.052), Halawa(0.172), Kawaihapai(0.034), Kemoo(0.211), Kemoo(0.317), Kemoo(0.109), Waialua(0.030), Stony steep land(0.020), Tropohumults(0.054)

ANNUAL IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
27.9	37.2	1010.9	41.6	34.1	22.1	23.0	5.5	2.1	50.0	50.0	12.1

GIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	37.227	36.435	50.684	22.214	37.706	42.448	44.640	46.323
	Thou. gpd/acre	2.770	2.711	3.771	1.653	2.805	3.158	3.321	3.446
249.12	Total thou. gpd	689.945	675.272	939.351	411.698	698.813	786.697	827.337	858.531

NIR STATISTICS

ACRES	UNIT	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
	inch/acre	27.920	27.327	38.013	16.660	28.279	31.836	33.480	34.743
	Thou. gpd/acre	2.077	2.033	2.828	1.239	2.104	2.368	2.491	2.585
249.12	Total thou. gpd	517.459	506.454	704.513	308.773	524.109	590.023	620.503	643.898

Kaala Ranch turf

Note:- Irrigated area for the selected MULTIPLE SPRINKLER irrigation system is 1.0 of the total area

MONTHLY IRRIGATION REQUIREMENT (INCHES)

WATER BUDGET COMPONENTS

MO	NIR	GIR	GAL_A	G_RAIN	N_RAIN	ER	ER21	RO	INT	ETo	ET	DR
1	0.6	0.8	20.7	7.4	5.9	2.6	3.7	1.3	0.2	3.1	3.1	3.3
2	0.7	1.0	26.4	5.1	4.2	2.4	2.6	0.7	0.2	3.2	3.2	1.8
3	1.5	2.0	53.0	4.6	3.9	2.4	2.6	0.5	0.2	4.1	4.1	1.5
4	1.9	2.5	68.2	3.2	2.7	2.1	2.0	0.3	0.2	4.4	4.4	0.6
5	3.3	4.4	120.3	1.9	1.5	1.4	1.2	0.2	0.2	5.0	5.0	0.2
6	4.0	5.3	143.9	1.0	0.9	0.9	0.7	0.0	0.1	5.0	5.0	0.0
7	3.9	5.2	142.3	1.5	1.2	1.2	1.0	0.1	0.2	5.1	5.1	0.0
8	3.9	5.2	141.5	1.4	1.2	1.1	0.9	0.1	0.1	5.1	5.1	0.0
9	3.6	4.8	129.4	1.4	1.2	1.1	0.9	0.1	0.1	4.7	4.7	0.1
10	2.6	3.4	93.5	3.3	2.6	2.0	1.8	0.6	0.2	4.1	4.1	0.6
11	1.2	1.6	44.3	4.8	3.9	2.6	2.5	0.7	0.2	3.1	3.1	1.3
12	0.8	1.0	27.3	6.1	5.0	2.4	3.1	0.9	0.2	2.9	2.9	2.6

GIR STATISTICS

MO	MEAN	MED.	XMAX	XMIN	50%	80%	90%	95%
1	0.8	0.0	3.0	0.0	0.8	1.7	2.3	2.9
2	1.0	1.2	4.3	0.0	1.0	1.8	2.2	2.6
3	2.0	1.7	6.5	0.0	1.8	3.2	4.1	4.9
4	2.5	2.6	5.6	0.0	2.4	3.7	4.4	5.1
5	4.4	4.4	7.2	1.2	4.4	5.9	6.6	6.7
6	5.3	5.6	7.2	2.5	5.4	6.4	6.7	6.7
7	5.2	5.5	7.1	1.6	5.3	6.4	6.9	6.9
8	5.2	5.5	8.6	1.3	5.2	6.6	6.8	6.8
9	4.8	5.2	6.9	1.2	4.8	5.9	6.2	6.3
10	3.4	3.8	5.7	1.2	3.4	4.6	5.2	5.4
11	1.6	1.5	4.3	0.0	1.6	2.6	3.2	3.7
12	1.0	1.2	3.8	0.0	1.0	1.9	2.4	2.9

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Honolulu, Hawaii

August 19, 1992

Chairperson and Members
Commission on Water Resource Management
State of Hawaii
Honolulu, Hawaii

Gentlemen:

Combined Well Construction & Pump Installation Permits and
Water Use Permits Prior to Well Construction and Pump Installation Permits

Your approval is requested to adopt the following considerations for the staff in processing construction and pump installation permits. These will be used by the Commission staff in evaluating and processing well permit applications for action by the Commission. These are considerations only; each request will be considered on a case-by-case basis.

COMBINED WELL CONSTRUCTION/PUMP INSTALLATION PERMITS MAY BE ALLOWED WHEN:

1. There is no evidence that it will affect other existing and proposed wells.
2. It is in an area where the hydrology and water quality is known or where the sustainable yield is substantially more than existing and proposed withdrawals.
3. The request is for backup wells in areas where the hydrology and water quality is known.
4. The request is for small capacity wells such as wells drilled for domestic/household uses, small irrigation wells, etc.
5. In water management areas, a water use permit has already been obtained and it is evident that the well will not affect other existing and proposed wells.

IN DESIGNATED WATER MANAGEMENT AREAS, UNLESS THE APPLICANT CAN PROVIDE CLEAR AND CONVINCING EVIDENCE TO THE CONTRARY, WATER USE PERMITS SHOULD BE OBTAINED PRIOR TO APPROVAL OF WELL CONSTRUCTION APPLICATIONS AND PUMP INSTALLATION APPLICATIONS.

IN CASES WHERE A WATER USE PERMIT IS OBTAINED, THE COMMISSION MAY DELEGATE AUTHORITY TO THE CHAIRPERSON TO APPROVE THE WELL CONSTRUCTION AND PUMP INSTALLATION PERMITS.

ITEM 18

Commission and Members
Commission on Water Resource Management August 19, 1992

DISCUSSION

These items were first presented at the June 17, 1992 Commission meeting. Some of the following major concerns were raised:

1. extent to which a rule or code change is required instead of a policy statement;

2. collapsing permits in water management areas does not allow maximum public review and comment, if it is believed that public review should be greatest in water management areas; and

3. well construction and pump installation permits should be allowed prior to water use permits in cases where test pumping is needed to find out more about the resource.

Our analysis is as follows:

1. Although the Commission may delegate authority to the Chairperson by policy, these guidelines will be incorporated in our on-going redraft of the administrative rules.

2. The water use permit procedure allows for public review through the public notice requirements as stated in the Water Code. This public review and comment is not diminished through this recommended policy.

3. The Commission may allow well construction and pump installation prior to water use permits on a case-by-case basis. Again, these are considerations for the staff to utilize in evaluating and processing applications.

Your favorable action and adoption will be appreciated.

Respectfully submitted,

RAE M. LOUI
Deputy Director

APPROVED FOR SUBMITTAL:

WILLIAM W. PATY, Chairperson

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Honolulu, Hawaii

March 16, 1994

Chairperson and Members
Commission on Water Resource Management
State of Hawaii
Honolulu, Hawaii

Gentlemen:

Honolulu Board of Water Supply
Application for a Well Construction Permit
and Request for a Declaratory Ruling
Manoa IV Exploratory Well (Well No. 1848-01), Manoa, Oahu

Applicant:

Honolulu Board of Water Supply
1151 Punchbowl Street
Honolulu, HI 96843

Landowner:

Department of Parks & Recreation
650 South King Street
Honolulu, HI 96813

Background: The applicant has submitted both water use permit and well construction permit applications to the Commission. It has been a practice of the Commission that "in designated water management areas, unless the applicant can provide clear and convincing evidence to the contrary, water use permits shall be obtained prior to approval of well construction applications and pump installation applications" (Approved by Commission on August 19, 1992).

Action Requested: The applicant is requesting that Commission approve a Well Construction Permit to drill the exploratory well prior to the issuance of the water use permit. Information obtained from the drilling and testing of the well will help determine the viability of the project and will determine what the applicant will request in the water use permit.

Commission staff is requesting a declaratory ruling to allow the drilling and testing of an exploratory well prior to obtaining a water use permit for the well, in areas where there is a lack of information.

Well Location/Tax Map Key: The well site is at Manoa, Oahu, at Tax Map Key: 2-9-36: 3 (see attached map).

Well Description:

Ground elevation:	160 ft.
Casing diameter:	12 inches
Solid casing depth:	100 ft.
Screen casing depth:	500 ft.
Open hole:	none
Total depth:	500 ft.
Grouted annulus:	0 to 95 ft.

Analysis: The applicant proposes to drill an exploratory well in the alluvium of Manoa Valley. A water use permit application will be submitted if pumping tests show a safe yield worth developing. The applicant recognizes that if pumping the well reduces stream flow, it could have an effect on the aquatic biota of the stream. Should the water level in the well approximate the water level of the stream, they will ask the U.S.Geological Survey to gage the stream during the testing. If pumping affects stream flow the applicant will consider petitioning the Commission to amend the interim instream flow standard for Manoa Stream and will be prepared to conduct any necessary biological reconnaissance survey. The applicant is of the opinion that if the water level in the well is substantially below Manoa Stream, then the stream is perched relative to the aquifer tapped by the well and no gaging or biological reconnaissance should be necessary.

Agenda 1
ITEM 9

Chairperson and Members
Commission on Water Resource Management March 16, 1994

Concerning the issuance of a well construction permit prior to a water use permit, the staff is of the opinion that it is reasonable to let the applicant drill the well first, as long as it is made clear that the issuance of the drilling permit shall in no way prejudice any future consideration by the Commission on the issuance or non-issuance of a water use permit. The applicant must understand that even if the well is successful, there is no guarantee that a water use permit will be approved. For exploratory wells, drilling and testing the well first gives the applicant the necessary information on which to base the water use permit request.

RECOMMENDATIONS:

A. That the Commission approve the issuance of a well construction permit, subject to the following conditions:

1. The Commission shall be notified before work commences.

2. The well construction permit shall be for construction and testing of the well only. The applicant shall coordinate with the Commission and conduct a pumping test in accordance with the protocol established by the Commission. A one-inch diameter (minimum) galvanized pipe shall be permanently installed, in a manner acceptable to the Commission, to accurately record water levels. No permanent pump may be installed and no water used from the well without first obtaining a water use permit and a pump installation permit from the Commission.

3. The applicant shall notify the Commission at least one week prior to conducting the pumping test, and shall coordinate with and notify the Commission of any proposed stream gaging conducted during the testing of the well.

4. The applicant shall comply with all applicable laws, rules, and ordinances.

5. The permit application and staff submittal approved by the Commission at its meeting on March 16, 1994 shall be incorporated herein by reference.

6. The permits may be revoked if work is not started within six months of the date of issuance or if work is suspended or abandoned for six months. The work proposed in the well construction permit application shall be completed within two years from the date of permit issuance.

B. That the Commission issue a declaratory ruling, effective in designated water management areas, that where there is insufficient information, an applicant may be allowed to drill and test an exploratory well prior to applying for a water use permit. The applicant shall be informed that the issuance of the drilling permit shall in no way prejudice any future consideration by the Commission on the issuance or non-issuance of a water use permit. If the well is successful, the applicant will apply for a water use permit. If the well is not successful, the applicant will apply for a permit to seal/abandon the well, or properly secure it in a manner approved by the Commission.

Respectfully submitted,

Edwin T. Sakoda
for: RAE M. DOUI
Deputy Director

Attach.
APPROVED FOR SUBMITTAL:

KEITH W. AHUE, Chairperson