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DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
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Ref: 749.sub

STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

March 21, 2007
Honolulu, Oahu

Taba Farm, Inc.
APPLICATION FOR A WATER USE PERMIT
Taba Farm Wells (Well Nos. 2358-21, 22, 26), TMK 9-6-02:2, WUPA No. 749
Existing (Agricultural) Use for 0.010 mgd (or Total Flow from Wells)
Waipahu-Waiawa Ground Water Management Area, Oahu

APPLICANT:

Taba Farm, Inc.
1391 Kaweloka St.
Pearl City, HI 96782

LANDOWNER:

Same

SUMMARY OF REQUEST:

The applicant requests that the Commission approve a water use permit for an allocation of 0.010 million gallons per day (mgd) or the total flow from three existing artesian wells to continue its existing irrigation water use for 2.3 acres of watercress.

LOCATION MAP: See Exhibit 1

BACKGROUND:

On September 28, 1979, the Board of Land and Natural Resources (BLNR) designated the Ewa and Wahiawa Tax Districts as the Pearl Harbor Ground Water Control Area under Chapter 166 Hawaii Revised Statutes (HRS).

On December 12, 1979, Mr. Seikichi Taba submitted timely Declarations of Existing Water Withdrawal and Use (DEWWU) for Well Nos. 2358-21 and -22, indicating that the wells were used for 5 acres of watercress at TMK 9-6-2:40. No estimate for the quantity of water used was given.

On December 17, 1979, Mr. Chomei Matsukawa submitted a timely DEWWU for Well No. 2358-26, indicating that the well was used for 1 acre of watercress at TMK 9-6-2:34. No estimate for the quantity of water used was given.

On April 11, 1980, the BLNR certified existing water withdrawals and uses in the designated area. However, Mr. Taba's and Mr. Matsukawa's existing uses were not included in this action. Staff understands that free-flowing artesian wells were excluded from certification by the BLNR, because only basal sources under forced withdrawal (i.e., pumping required) were subject to water use regulation. All the subject wells were artesian at the time, having initial heads about 9 to 10 feet above ground surface.

Following the repeal of Chapter 166 HRS and its replacement with Chapter 174C HRS, Mssrs. Taba and Matsukawa submitted Registration of Well and Declaration of Water Use forms as required under §174C-83 HRS. Similar information to that provided in their 1979 DEWWU forms was given. Because the Pearl Harbor Ground Water Control Area was continued as the Pearl Harbor Ground Water Management Area under Chapter 174C HRS, declared existing uses were not revisited or reviewed for compliance with the new requirements of the Water Code. Currently, the Commission's policy on water use regulation has been expanded to include artesian and other water sources which had been exempt under the BLNR (such as gravity flow tunnels).

On September 23, 2005, Taba Farm, Inc. filed an application for their existing use of three artesian wells that were supplying their 2.3 acre commercial watercress farm. The application initially requested use of 0.010 mgd for continued watercress agriculture use from three onsite artesian wells. The applicant acknowledged that its initial filing was incomplete due to outstanding Special Management Area issues.

On July 17, 2006, staff received notification from the City Department of Planning and Permitting that all Special Management Area issues had been resolved.

On August 8, 2006, staff sent a letter to representatives for Taba Farm outlining additional information that was needed to support the application.

On October 23, 2006, staff conducted a site visit to document the existing agriculture use and wells. Mr. Glenn Taba stated that they were motivated to seek a water use permit to protect their interest in the wells on their property following a legal dispute over use of one of their wells by a lessee on an adjacent parcel.

On December 18, 2006, Taba Farm responded to staff's October 23, 2006 letter and the application was accepted as complete.

Additional information regarding the source, use, notification, objections, and field investigation(s) is provided in Attachment A.

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 104 mgd as the sustainable yield for the Waipahu-Waiawa Aquifer System. Individual existing water use permits in this aquifer system are shown in Exhibit 2. A summary of the current ground water conditions in the aquifer area is provided in Table 1:

Table 1. Waipahu-Waiawa Aquifer System Area

ITEM	Waipahu-Waiawa Aquifer System Area (mgd)
Sustainable Yield	**104**
Allocation Milestone	**82**
Pumpage Milestone	**62**
Less: Current Allocations (shown in Exhibit 2) (12-Month Moving Average Withdrawal; Exhibit 3)	82.634 (49.808)[1]
Reservation to DHHL	1.358
Subtotal (Current Available Allocation)	**20.008**
Less: Pending Allocation Requests	0
Pending Reservation Request (DHHL)	2.303
Less: This Application	0.864
Subtotal (Potential Available Allocation)	16.841

[1] 12-Month Moving Average Withdrawal as of July 31, 2006.

Table 1 shows that we are currently over the 82 mgd Allocation Milestone, but within the sustainable yield of the aquifer. The twelve-month moving average withdrawal from the aquifer is estimated to be 49.808 mgd as of July 31, 2006 (see Exhibit3), well within the 62 mgd Pumpage Milestone.

Exhibit 4 shows that once the Allocation Milestone is reached, the Commission must initiate the development of water shortage plans for the Pearl Harbor and Honolulu Aquifer Sector Areas and complete the water shortage plans within four years. The Allocation Milestone was reached in October 2005. Therefore, the deadline for water shortage plan development is October 2009.

There is a significant amount of unused allocations in Waipahu-Waiawa that may be revoked due to four years of nonuse. Table 1 shows that revocation of 0.634 mgd would put allocations below the Allocation Milestone.

Staff has been working with the permittees for the EP 18 Battery (Well Nos. 2102-02, 04 to 22, 2002-03 to 22), which has an agricultural allocation for 7.969 mgd but has been using less than 3 mgd, to revoke some of the unused allocation. A two-year review for possible revocation of unused allocation was attached as a special condition to the water use permit for EP 18 (approved in 2000). Due to the ongoing Waiahole Ditch contested case hearings, the permittees requested that the Commission defer any revocation action until the contested case hearing is completed because if a water use permit for Waiahole Ditch is denied, this ground water source may be needed to supplement agricultural water needs. The most recent Decision and Order in the contested case was issued on July 13, 2006. This Decision and Order granted agricultural allocations from the Waiahole Ditch system. On February 1, 2007, staff met with consultants for D.R. Horton, the permittee for EP 18. An agreement was reached for revocation of 3 mgd due to nonuse (Exhibit 5). Staff is awaiting a map delineating existing and future use areas to support the proposed revocation. Staff anticipates submitting a proposed revocation of 3 mgd from the EP 18 Battery to the Commission in either April or May of this year.

The anticipated revocation action in Waipahu-Waiawa will result in allocations falling below the Allocation Milestone. Even so, staff has already initiated development of a water shortage plan for the Pearl Harbor Sector Area. Staff is working to complete this water shortage plan by June 30, 2007.

The status of Milestone Requirements/Actions whose deadlines have passed as of this submittal's date are summarized below:

Table 2. Status of Milestone Requirements/Actions

Milestone Requirement/Action	Timeframe	Status
2.Execute WUP Revocations[1]	3/15/01	Completed.
3. Process Pending Requests[2]	3/15/01	Completed[3].
4.A. Develop monitoring plan, including agreement from parties for funding/construction, site selection, funding/data gathering, etc.	3/15/01	Ongoing. The USGS, CWRM, and BWS have formed a working group to address Milestone Actions 4 through 6. A Memorandum of Agreement (MOA) to share data & work towards the development of a monitoring plan, including optimization and response measures, has been drafted and signed.
4.B. Develop monitoring plan, including agreement as to the number of new monitoring wells prior to reaching the Pumpage Milestone.	3/15/01	Ongoing. Same as status of 4.A above. 12-MAV is 49.808 mgd, well below the 62 mgd Pumpage Milestone.
5.A. Set other resource monitoring criteria.	3/15/02	Ongoing. Same as status of 4.A. above.
6. Develop infrastructure optimization plan.	3/15/02	Ongoing. Same as status of 4.A. above.
6.A. List of impacted infrastructure	3/15/01	Completed
6.B. Develop optimization plan to include: 1) costs and available funding, 2) affected allocation amounts, 3) optimization enforcement policy, 4) water quality considerations, 5) implementation timeline.	3/15/02	Ongoing. Same as status of 4.A. above.
6.C. Reach agreement/commitment from various parties.	3/15/03	Ongoing. Same as status of 4.A. above.

1 For permitted uses having 4 or more years of continuous nonuse as of March 15, 2000.

2 For water use permit applications pending as of March 15, 2000.

3 Except for DHHL additional reservation request, which has been administratively deferred. DHHL is being encouraged to participate in the county's integrated resource planning process to update the Water Use and Development Plan that sets forth the broad allocation of water to land use. DHHL has an existing reservation for 1.358 mgd (WUP No. 566; see Exhibit 2) that was initially allocated in 1994 for 1.724 mgd. Since 1994, DHHL has only drawn down their reservation by 0.366 mgd.

Since the adoption of the new sustainable yields, the Commission and Board of Water Supply have constructed nine (9) additional deep monitor wells in the Pearl Harbor and Honolulu Aquifer Sector Areas. Although several of the Milestone Requirements/Actions have not been fully complied with by their respective deadlines, the staff is not recommending that the

Commission defer action on this application (which is an option under Note 4 of Exhibit 4) given the progress of the monitoring plan, current pumpage, staff's planned revocation actions, and ongoing development of a water shortage plan. Based on the foregoing, ground water is available to accommodate this 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 continued use of three artesian wells that have been supplying irrigation water for Taba Farm's commercial watercress operation since the 1960's. Agricultural water use is supported by the Water Code's Declaration of Policy section, §174C-2(c) HRS, which states that the Water Code shall be liberally interpreted to obtain maximum beneficial use of the waters of the State for various purposes including agricultural uses.

II. Quantity Justification

The initial application requested 0.010 mgd based on an estimated flow rate from the wells, which was computed using a timed volume method and average cross-section method. Using these methods, an estimated demand of 4,350 gpd/ac was derived, or about 10,000 gpd for the 2.3 acre farm. However, due to the lack of a defined channel and diffused flow, the estimate is probably erroneous. In their December 18, 2006 letter, representatives for Taba Farm clarified their request to be the total amount of water flowing from the 3 requested wells at the Taba Farm site.

Watercress requires a constant flow of cool water, although the actual consumptive use is much lower. The Commission does not have any guidelines for watercress demands. However, a draft report prepared for the Commission on actual water usage for various crops shows watercress has a demand of 50,000 to 100,000 gpd/ac in Florida and 500,000 to 1,000,000 gpd/ac for Hawaii (A Literature Compilation of Water Usage for Hawaii (Draft Report), Gee and Murabayshi, May 1994). The report did not discuss why watercress uses so much more water in Hawaii than in Florida.

During the site visit, staff discovered two other onsite artesian wells that also contribute to the total flow. Based on mapped information obtained from Board of Water Supply (BWS), staff identified the five wells as Well Nos. 2358-08, 21, 22, 26, & 29 (Exhibits 6 and 11). Of the five wells on the property, Well No. 2358-08 does not contribute to the flow through the fields, but instead flows into some koi ponds on an adjacent property and from there discharges into Waiawa Stream (Exhibit 7).

No metered data are available for any of the 5 onsite wells. Staff conducted a timed discharge test to estimate the flow from Well No. 2358-26 (Exhibit 8), which discharges through a PVC pipe into the watercress fields. Based on the average of six timed measurements, staff estimates the flow from Well No. 2358-26 to be 150 gpm, or 0.216 mgd. This well is assumed to be representative of the natural flow from the the other 3 sources that contribute to the irrigation supply due to the close proximity of the wells, and their similar depths, initial heads, initial chlorides, and identical casing sizes. A summary of the wells' physical characteristics is presented in Exhibit 9. Extrapolating the 0.216 measured flow from 2358-26 to the other 3 wells, the total flow through the fields is estimated to be 0.864 mgd. This falls within the range of actual watercress use documented for Hawaii watercress operations (0.500 to 1.000 mgd)

Taba Farm has requested that it be exempt from the water use reporting requirement because the wells are not metered and the flow is not controlled by any mechanical means. Taba Farm believes that having to install a meter to measure flow would be costly, and would not promote resource protection.

However, should the Commission approve a water use permit for Taba Farm, staff is recommending that the Commission require the applicant to install a meter on Well No. 2358-21 to measure water use (Exhibit 10). Well No. 2358-21 is the only well equipped with a pump; however, the pump capacity is unknown. The pump is activated intermittently throughout the day to pressurize a sprinkler system that is used for pest control.

Well No. 2358-21 sits within a square concrete sump. The water flows out of the submerged well and over the top of the walls of the concrete sump. During the site visit, the pump, which is on a timer system, was activated. As the pumping commenced, staff noted that the natural flow from the well appeared to diminish, then cease to flow over the top of the walls of the concrete sump, until the sprinkler system became fully pressurized. At that point, the flow from the well again began to overtop the concrete sump walls, though at a noticeably reduced rate.

Based on this observation, staff believes that the natural flow from Well No. 2358-21 may be about equal to the pump capacity. Therefore, if the early start-up rate of water flowing through the discharge line is measured, a better estimate of the natural flow from the well could be obtained. This estimate can then be applied to the other three wells to derive an estimate of the total flow from the four source wells. Staff feels that this is a reasonable means to estimate water use, which should then be reported to the Commission on a regular monthly basis pursuant to Standard Condition 10.

Staff is recommending that the Commission waive the requirement to install flow meters on the other three wells because it will likely be very difficult and costly to retrofit the wells such that meters can be installed. Access and mobilization would be very difficult given the site access constraints. In addition, these wells are very old and depending on the condition of the casing, the wells may have to be recased first. Staff believes that metering Well No. 2358-21 and using this data as a surrogate for the other three flowing wells will provide a reasonable means to estimate total water use. Once a sufficient record of withdrawals is established, the Commission can then revisit the water use permit allocation and refine the allocation if necessary. Setting reasonable allocations from which available sustainable yield can be determined for meeting new uses would help the Commission to achieve its responsibility to promote maximum reasonable-beneficial use of the state's water resources.

III. Efficiency of Use

The wells are not valved and there is no means to control the free flow of water from the wells. The applicant has not studied what impact a lesser amount of flow would have on the watercress production. However, while the applicant acknowledges that it may be possible that the farm could operate with less water, the applicant feels that the cost of valving the wells would be substantial, while the benefit to the resource would be negligible. After running through the fields, the water is discharged into Waiawa Stream, which runs along the makai boundary of the property. Based on the proximity of the wells to the stream, if the wells were valved, it is likely that the ground water would emerge in Waiawa Stream anyway. Exhibit 11 shows satellite photos of the Taba Farm property in relation to Waiawa Stream and Pearl Harbor and a photograph of the farm taken during the site visit.

Therefore, although this use has not been shown to be efficient, from a resource protection standpoint, there appears to be a minimal benefit to valving the well, while the cost of valving is likely to be substantial.

IV. Analysis of Practical Alternatives

The applicant identified two alternatives to the use of its wells: 1) potable water from the municipal system and 2) Waiawa Stream Water. The applicant claims neither of these alternatives are practicable.

In the case of municipal water, given the water needs of watercress, Taba Farm has stated that it would be cost-prohibitive to purchase water from BWS. In addition, it is questionable whether a nonpotable irrigation use is the best use of the potable water. Staff agrees that use of municipal water is not a superior alternative to the continued use of the nonpotable, slightly brackish well water (~500 mg/L). The Commission's policy is that the quality of the water supply should be matched with the quality of water needed, and that the highest quality water should be allocated to the highest uses.

According to Taba Farm, the second alternative, Waiawa Stream water, is also not practicable because Waiawa Stream is located on the downhill side of the property and would have to be pumped up to the top of the property which would result in costly infrastructure and energy costs. Secondly, there is concern that the quality of Waiawa Stream water may be insufficient for use on watercress. Waiawa Stream is on the Department of Health's 2004 list of impaired waters under the Clean Water Act section 303(d) list.

Therefore, these two alternatives do not appear to be practicable alternatives.

(3) Interference with other existing legal uses

There are numerous wells in the vicinity of Taba Farm's wells. However, Taba Farm's use dates to the early 1960's. Therefore, the continued use of these irrigation wells should not interfere with any other existing legal uses.

(4) 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.*"

The proposed permit is for agricultural irrigation use, which is an objective declared to be in the public interest.

The Division of Aquatic Resources commented that aquatic resource values in Waiawa Stream may be impacted, particularly if chemicals are used in the watercress farming operations. Taba Farm does not use any chemicals in its farming operations. The intermittent pumping of Well No. 2358-21 to the overhead sprinkler system serves as Taba Farm's pest control method.

Therefore, the proposed water use is consistent with the public interest.

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

The proposed use is in the State Urban District. Agricultural use is a permitted use in the Urban District. Therefore, the proposed use is consistent with the state land use designation.

The current county zoning for the parcel is R-5. The Department of Planning and Permitting (DPP) has commented that, according to the Master Use Table No. 21-3 of the City's Land Use Ordinance (Chapter 21 of the Revised Ordinances of Honolulu), crop production is not a permitted use in the R-5 Residential District. However, DPP has additionally commented that the existing residential zoning is consistent with the Primary Urban Center's Development Plan, which was adopted by Ordinance 04-14 on June 21, 2004. The project site is located within the Urban Community Boundary, which serves as a general guide to future urban growth. The existing use for watercress production may be continued as a non-conforming use, and will be consistent with Objective C: To maintain the viability of agriculture on Oahu, as provided under the Economic Activity chapter of the City's General Plan.

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 County's County Council, DPP, and the Department of Water Supply;

Review comments from the Division of Aquatic Resources and the City Department of Planning and Permitting have been discussed in the above sections. No other comments or objections have been made through this review.

Therefore, the proposed use is consistent with the state & county general plans and land use designations.

(6) County land use plans and policies

Again normal County review includes County Council, Department of Planning and Permitting, and the Department of Water Supply. All comments received have been summarized in the above sections. No objections have been raised.

Therefore, the proposed use is consistent with 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) and the Office of Hawaiian Affairs have reviewed this application and made no comments or objections. Further, 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.

Therefore, this application will not interfere with Hawaiian home lands rights.

Other issues

Well No. 2358-08 is a freely-flowing artesian source on the Taba Farm property that is not contributing to the watercress irrigation supply. As discussed earlier, the well water flows to some koi ponds on an adjacent property before discharging to Waiawa Stream. The quantity of flow most likely far exceeds the amount needed to sustain the koi pond, which appears to be an incidental use. Ideally, this well should be sealed if there are no future plans to use the water. A sample taken during the site visit was analyzed by the titration method and showed the chlorides were 3,380 mg/L, which is high for irrigation use.

However, the cost for sealing the well would be substantial. Mobilization would be very difficult. Staff has begun discussions with the DOH to work towards a more global approach for sealing old, unused wells. Staff is exploring the possibility of obtaining funds through DOH's Groundwater Protection Program to do a comprehensive survey of unused wells in order to determine whether they meet the criteria for abandonment. Once a well has been determined to be abandoned, the Commission can order the landowner to seal the well. If the landowner lacks the funds to properly seal the well, the Commission has the authority to do the sealing work and place a lien on the property. However, the Commission lacks the funding to do the initial work. We are hopeful that we can work with DOH for start-up funds for the sealing program and then prioritize the most problematic wells for sealing.

As can be seen from Exhibit 1, there are numerous old wells in the vicinity. Some of these have been sealed, but others may be in the same state as Well No. 2358-08 (Exhibit 12). Staff is not recommending that the Commission subject Taba Farm to costly remedial work because of its self-reporting and desire to come into compliance with the Water Code provisions. We feel a comprehensive survey and approach to well sealing is a more equitable solution.

RECOMMENDATION:

Based on the above analysis, staff finds that the proposed use is consistent with the seven criteria for obtaining a water use permit. Staff recommends that the Commission approve the issuance of Water Use Permit No. 749 to Taba Farm, Inc. for the reasonable and beneficial use of 0.864 million gallons per day of non-potable water for agricultural use from the Taba Farm Wells (Well Nos. 2358-21, 22, 26, & 29), 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.

3. Standard Condition 10 is modified to waive the requirement for installing a water meter on Well Nos. 2358-22, 26, and 29. The permittee shall install a water meter on Well No. 2358-21 to measure the rate of withdrawals during pumping of the well. The total monthly run time of the pump must also be recorded and reported such that an estimate of the operating pump capacity may be determined.

Respectfully submitted,

W. Roy Hardy

W. ROY HARDY
Hydrologic Program Manager

Attachment(s): A (Water Use Permit Detailed Information)
B (Water Use Permit Standard Conditions)

Exhibit(s): 1 (Location Map)
2 (Existing Water Use Permits and 12-Month Moving Average Withdrawal)
3 (Graph of Total Pumpage from the Waipahu-Waiawa Aquifer System Area)
4 (Pearl Harbor Milestones)
5 (2/1/07 Memorandum for the Record on EP 18 Battery)
6 (Well Location Schematic)
7 (Photographs of Well No. 2358-08 and Koi Pond)
8 (Photograph of Well No. 2358-26)
9 (Physical Characteristics of Taba Farm Wells)
10 (Photograph of Well No. 2358-21)
11 (Photographs of Taba Farm, Wells, and Waiawa Stream)
12 (Physical Characteristics and Status of Other Nearby Wells)

APPROVED FOR SUBMITTAL:

PETER T. YOUNG
Chairperson