WELL MODIFICATION PERMIT
for
Keauhou Irrigation Well #3
State Well No. 3457-03
Keauhou, Hawaii

TO: Otaka, Inc.
2571 Lemon Road
Honolulu, Hawaii 96815

In accordance with Chapter 166 of Title 13, "Rules for the Control of Ground Water Use in the State of Hawaii", your application to install a new 450 to 500 gpm pump in State Well No. 3457-03 for golf course irrigation is approved subject to the following conditions:

1. A Driller's Report (enclosed) on the pump installation shall be submitted to the Division of Water and Land Development (P.O. Box 373, Honolulu, Hawaii 96809) within 60 days after completion of the work.

2. Pumping test data shall be submitted within 60 days after testing of the well.

3. Reports of pumpage shall be submitted monthly after the well is put into production.

4. An "as-built" drawing of the installed pump shall be submitted upon completion of the well.

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

Date of Issuance
MAR 6 1987

Enc. (Driller's Report Form)
cc: USGS
Dept. of Health,
Drinking Water Program
Hawaii DWS

William W. Paty
Chairperson of the Board
<table>
<thead>
<tr>
<th>FROM:</th>
<th>INITIAL:</th>
<th>DATE: 3/3/87</th>
<th>FILE IN:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. CHING</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Lum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Sakoda</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Nakano</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M. Ohye</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S. Miyamoto</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S. Samuels</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Hamada</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K. Oshiro</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Stewart</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M. Tagomori</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>H. Sakai</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>G. Morimoto</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S. Kokubun</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PLEASE:**

- See Me
- Call
- Review & Comment
- Take Action
- Investigate & Report
- Draft Reply
- Acknowledge Receipt
- Type Draft
- Type Final cc:
- Xerox copies
- File
- Mail

**FOR YOUR**

- Approval
- Signature
- Information

**REMARKS:**

- Hold till permit signed by Paty
State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES

APPLICATION FOR (check one)
☐ WELL DRILLING PERMIT ☒ WELL MODIFICATION PERMIT

Instructions: Send completed application and attachments to Department of Land and Natural Resources, P.O. Box 373, Honolulu, Hawaii 96809.
Reference: Regulation 9, Dept. of Land & Natural Resources.

Is the well located in a Designated Ground Water Control Area? ☐ Yes ☒ No
If "yes", application must be accompanied by a Water Use and/or Water Supply Permit and a non-refundable filing fee of $100 payable to the Department of Land & Natural Resources. However, if application is for minor modification of well, filing fee may be waived. If "no", no filing fee is required. Filing fee is waived for federal, state, and county government agencies.

1. WELL LOCATION: Island Hawaii Tax Map Key 7-8-10:77. Attach a plot plan showing well location referenced to established property boundaries.
2. WATER USER OTAKA, INC. Telephone 924-4067
Address 2571 Lemon Road, Honolulu, Hawaii Zip Code 96815
3. PROPOSED DRILLING COMPANY: WATER RESOURCES INTERNATIONAL, INC.
4. PROPOSED WORK: ☐ Drill new well ☐ Deepen ☐ Redrill ☐ Alter ☐ Seal ☐ Abandon ☐ Install new pump ☐ Replace pump ☐ Modify pump
Fill in the diagram and briefly describe the proposed work (use back of form if necessary):
The well will be used for irrigation system for the golf course.

---

PROPOSED SECTION OF WELL

<table>
<thead>
<tr>
<th>Ground Elev.</th>
<th>366.21 ft., msl*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid casing:</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>steel</td>
</tr>
<tr>
<td>Length</td>
<td>367 ft.</td>
</tr>
<tr>
<td>Diameter</td>
<td>12 in.</td>
</tr>
<tr>
<td>Wall thickness</td>
<td>5/16 in.</td>
</tr>
<tr>
<td>Casing: X</td>
<td>Perforated Screv.</td>
</tr>
<tr>
<td>Material</td>
<td>steel</td>
</tr>
<tr>
<td>Length</td>
<td>20 ft.</td>
</tr>
<tr>
<td>Diameter</td>
<td>12 in.</td>
</tr>
<tr>
<td>Wall thickness</td>
<td>1/4 in.</td>
</tr>
<tr>
<td>Openings</td>
<td>85 sq.in./L.F.</td>
</tr>
<tr>
<td>Open Hole:</td>
<td>None</td>
</tr>
<tr>
<td>Length</td>
<td>ft.</td>
</tr>
<tr>
<td>Diameter</td>
<td>in.</td>
</tr>
</tbody>
</table>

*Approximate elev. at filing. Final elev. (msl) by a surveyor licensed by the State must be submitted at start of construction.

5. PROPOSED USE: ☐ Municipal ☐ Military ☒ Agriculture ☐ Industrial
☐ Domestic ☐ Disposal ☐ Other (specify)

6. PROPOSED AMOUNT OF WITHDRAWAL: Check most appropriate box and fill in amount.
☐ Daily 500,000 gallons ☐ Monthly gallons ☐ Yearly gallons

7. PROPOSED PUMP OR FLOW CAPACITY: 450 to 500 gallons per minute

OTAKA, INC.
Signature: [Signature]
Date: February 3, 1987
Water User
OTAKA, INC.
Signature: [Signature]
Landowner of Well Site
Date: February 3, 1987

For Official Use:
State Well No. 3457-03
DLNR Permit No.
DLNR Application No.
WATER RESOURCES & FLOOD CONTROL BRANCH
Division of Water and Land Development

FROM: MK
TO: INITIAL:

PLEASE:

See Me
Call
Review & Comment
Take Action
Investigate & Report
Draft Reply
Acknowledge Receipt
Type Draft
Type Final cc:
Xerox copies
File
Mail

REMARDS:

KEALOHU PIER WELL #3
DRILLED BY PILI ISLE DRILLING, L1984 OR 1985
NO PERMIT

WATER RESOURCES INST. TO DO
MODIFICATION. DATA BROUGHT IN BY HOWARD AKAGI (WR11)

FOR YOUR

Approval
Signature
Information

Process quicker
APPLICATION FOR (check one)

☐ WELL DRILLING PERMIT  ☐ WELL MODIFICATION PERMIT

Instructions: Send completed application and attachments to Department of Land and Natural Resources, P.O. Box 373, Honolulu, Hawaii 96809.

Reference: Regulation 9, Dept. of Land & Natural Resources.

Is the well located in a Designated Ground Water Control Area?  ☑ Yes  ☒ No

If "yes", application must be accompanied by a Water Use and/or Water Supply Permit and a non-refundable filing fee of $100 payable to the Department of Land & Natural Resources. However, if application is for minor modification of well, filing fee may be waived. If "no", no filing fee is required. Filing fee is waived for federal, state, and county government agencies.

1. WELL LOCATION: Island Hawaii Tax Map Key 7-8-10:77. Attach a plot plan showing well location referenced to established property boundaries.

2. WATER USER OTAKA, INC. Telephone 924-4067
   Address 2571 Lemon Road, Honolulu, Hawaii Zip Code 96815

3. PROPOSED DRILLING COMPANY: WATER RESOURCES INTERNATIONAL, INC.

4. PROPOSED WORK: ☐ Drill new well ☐ Deepen ☐ Redrill ☐ Alter ☒ Seal
   ☐ Abandon ☐ Install new pump ☐ Replace pump ☒ Modify pump

Fill in the diagram and briefly describe the proposed work (use back of form if necessary):

The well will be used for irrigation system for the golf course.

5. PROPOSED USE: ☐ Municipal ☐ Military ☒ Agriculture ☐ Domestic ☐ Disposal ☐ Other (specify) ________

6. PROPOSED AMOUNT OF WITHDRAWAL: Check most appropriate box and fill in amount.

☒ Daily 500,000 gallons ☐ Monthly ☒ Yearly gallons

7. PROPOSED PUMP OR FLOW CAPACITY: 450 to 500 gallons per minute

Signature: OTAKA, INC.

Date: February 3, 1987

Signature: OTAKA, INC.

Date: February 3, 1987

For Official Use:

State Well No. 3457-03

DLNR Permit No.

DLNR Application No.

Mr.Guido Giacometti
Kamehameha Investment Corporation
P.O. Box 459
Honolulu, Hawaii 96809

Dear Guido:

Keahou Irrigation Well No. 3 - Pump Test Results

With completion of a 24-hour pump test last week, Big Island Drilling Company has completed its contract for Keahou's new irrigation well. The bottom of the well was kept as shallow as possible. It is 387+ feet below ground, 23 to 24 feet into the water table. The lowest 20 feet of the well has louvered casing (12-inch inside diameter, 5/16-inch wall thickness, about 85 square inches of 1/4-inch louvered openings per foot of screen); the balance is solid casing (12-inch, 5/16-inch thickness). No gravel pack was used and the bottom of the well is open.

The test pump's intake was set 2+ feet off the bottom to clean the well and conduct the pump test. The enclosed graph portrays drawdown characteristics for a range of pumping rates. At the prospective 500 to 700 gallons per minute (GPM) pumping rate of a permanent pump, drawdown would be a modest 1.4 to 2.4 feet. Chloride content was 970 milligrams per liter (MGL) at the start of the test. After an hour at rates between 330 and 1,340 GPM, chlorides rose to 1,150 MGL. For the next 12 hours at an average pumping rate of 465 GPM, chlorides increased gradually to 1,240 MGL. For the last 11 hours at an average of 705 GPM, chlorides held steady at 1,240 MGL.

Intake of the permanent pump should be 8 to 10 feet into the water table. To help decide whether or not to install the permanent pump now, we are throttling the North well to determine if its salinity will improve at a lower flowrate. If this is possible, a rapid and inexpensive solution would be to relocate the pump in the North well to the new well. For the cost of labor and added shaft and column pipe, water of better quality from the new well would be made available. Subsequently, a smaller and less expensive pump could be installed in the North well.

For reference, pumpage rates from the two existing irrigation wells and the sewage flow at the Heeia treatment plant are summarized on the enclosed table.

Sincerely,

Tom Nance

TN:ks
cc:Guy Lam
Enclosures
Keauhou Irrigation Well No. 3
Pump Test of January 29-30, 1985

Pumping Rate (Gallons Per Minute)