Ms. Lenore Nakama  
State of Hawaii, Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, Hawaii 96809

Schofield Army Barracks RI/FS Well Information  
Permit Applications and Completion Reports  
Schofield Barracks, Hawaii

Dear Ms. Nakama:

As discussed during our telephone conversation on August 27, 1996, we have enclosed a copy of a USGS topographic map showing the locations of 12 monitoring wells installed for this project. The monitoring wells are identified on the map by their Army identification numbers. When we received your letter dated April 11, 1996, there seemed to be some confusion over which state well identification numbers were assigned to which of our monitoring wells. Your letter indicated that Wells 4-2 and 4-4 were assigned state well identification numbers 3-2900-01 and 3-3004-03, respectively. The actual geographic location of Well 4-2 does not correspond to well identification number 3-2900-01. Based on our records, the state well identification numbers should be assigned as follows:

<table>
<thead>
<tr>
<th>Project Well Number</th>
<th>Hawaii State Well ID Number</th>
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</thead>
<tbody>
<tr>
<td>1-1</td>
<td>3-2901-13</td>
</tr>
<tr>
<td>2-1</td>
<td>3-2900-02</td>
</tr>
<tr>
<td>2-2</td>
<td>3-2903-01</td>
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<tr>
<td>2-3</td>
<td>3-2902-03</td>
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<td>2-4</td>
<td>3-2801-02</td>
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<tr>
<td>2-5</td>
<td>3-2959-01</td>
</tr>
<tr>
<td>2-6</td>
<td>3-2802-01</td>
</tr>
<tr>
<td>4-2</td>
<td>3-3004-02</td>
</tr>
<tr>
<td>4-2A</td>
<td>3-3004-05</td>
</tr>
<tr>
<td>4-3</td>
<td>3-3004-03</td>
</tr>
<tr>
<td>4-4</td>
<td>3-3004-04</td>
</tr>
</tbody>
</table>

We hope this table and the map will help clear up the confusion regarding the well numbers and locations.

As requested in your April 11, 1996 letter, we have enclosed the following information:

1. Well 1-1 (State Wall ID No. 3-2901-13)  
   a. After-the-fact application for a well construction/pump installation permit  
   b. Well completion report
October 14, 1996
28339.06.01.12
0225AR
Ms. Lenore Nakama
State of Hawaii, DLNR
Page 2

2. Well 4-2 (State Well ID No. 3-3004-02)
   a. Well completion report
   b. Well completion diagram

Although 12 monitoring wells were installed over the lifetime of the project, only 11 are functioning with submersible pumps. There were problems during the installation of Well 4-2. The cable used to pull the pump out of the well broke. After numerous unsuccessful attempts to retrieve the pump, the pump was abandoned and is not functional. Thereafter, Well 4-2 was used only to measure groundwater levels. Thus, a pump installation report and diagram were never included in the original permit application. Because Well 4-2 could not be used as a monitoring well, a new well was drilled within 15 feet of the old well. We gave the new well the name 4-2A, and this may have led to additional confusion.

Your April 11 letter also requested information on State Wells 3-2900-01 and 3-3004-03. From our records, State Well 3-3004-03 refers to Well 4-3 instead of 4-4, as listed in your letter. But we are uncertain which wells are referred to by State Wells 3-2900-01 and 3-2900-02. At one time, we did propose to install a monitoring well in a part of the East Range, but that idea was rejected. It is possible, perhaps, that someone such as the drilling company may have submitted a permit application in advance. If that is the case, that particular permit should be withdrawn, as that well was never drilled. Because of the confusion, we have enclosed copies of the well completion reports for both Wells 4-3 and 4-4.

In addition, we have enclosed survey data for all the wells, and the well completion report for Well 2-6 with supporting boring log and well completion diagram information.

We hope that this information will help clarify the confusion between the two well identification systems. I will be available to discuss these wells with you personally if you so desire. If you have any questions, please feel free to call.

Sincerely yours,

HARDING LAWSON ASSOCIATES

Bruce S. Wedgeworth
Associate Geologist

Enclosures

cc: Mr. Jon Fukuda / U.S. Army, Department of Public Works
Harding Lawson Associates
235 Pearlridge Center, Phase I
98-1005 Moanalua Road
Aiea, Hawaii 96701

Attn: Mr. Bruce S. Wedgeworth

Subject: FIELD LOCATION OF MW 2-6
At Wheeler Army Airfield
Oahu, Hawaii

<table>
<thead>
<tr>
<th>Northing</th>
<th>Easting</th>
<th>Elevation</th>
<th>Latitude</th>
<th>Longitude</th>
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<tr>
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<td>484685.053</td>
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<tr>
<td>BM#1</td>
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<td></td>
<td>689.50</td>
<td></td>
</tr>
<tr>
<td>BM#2</td>
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<td>689.55</td>
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<tr>
<td>BM#3</td>
<td></td>
<td></td>
<td>689.46</td>
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</tbody>
</table>

Coordinates referred to Hawaii State Plane Coordinate System - Zone 3
Elevation Datum = Mean Sea Level (MSL)
ELEVATION OF MONITORING WELLS AS SURVEYED
ON 7/15/95 (WITH BRUCE & MARK OF HARDING
AND LAWSON)

MW-4-2A = 946.87 feet — Black mark on top of tube
MW-4-2 = 947.11 feet — Black mark on top of tube
"T" cut near casing of MW-4-2A = 945.91 feet

MW-4-1 = 853.47 feet (as surveyed on 3/14/95)
"T" cut = 851.12 feet
Diff. = 2.35 feet (Bruce need diff. in elev. only)

MW-4-3 = 884.15 feet (as surveyed on 3/14/95)
"T" cut = 882.52 feet
Diff. = 1.63 feet (Bruce need diff. in elev. only)

MW-4-4 = 829.88 feet — Black mark

MW-2-2 = 864.34 feet — Black mark on top of tube
"T" cut = 862.90 feet

MK1-2-3 = 828.81 feet — Black mark on top of tube
"T" cut = 827.20 feet

MK1-2-4 = 829.70 feet — Black mark on top of tube
"T" cut = 828.00 feet

MW-2-1 = 903.75 feet — Black mark on top of tube
### COORDINATE MANAGER

**Wednesday January 10, 1996 12:54 PM**

Coordinate File Name: HARDING.CO

<table>
<thead>
<tr>
<th>Point</th>
<th>Northing</th>
<th>Easting</th>
<th>Elev</th>
<th>Descr</th>
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</thead>
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<tr>
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<td>0.9999900 SCALE FACTOR</td>
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<td>0-00-13.601</td>
<td></td>
<td></td>
<td>0.9999464 GRID FACTOR</td>
<td></td>
</tr>
</tbody>
</table>

**SP— HAWAII STATE PLANE COORDINATE SYSTEM, ZONE 3 (NAD 27)**
Mr. Jon Fukuda  
United States Army  
DPW, Attn: APVG-GWV, U.S. Army Garrison  
Schofield Barracks, HI 96850-5000

Dear Mr. Fukuda:

After-the-Fact Well Construction Permit  
MW 2-3 (Well No. 2902-03)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s). As part of the Commission's approval, the following special conditions were added and are part of your permit under Standard Permit Condition 11:

**Special Conditions**

1. Standard Conditions 1, 2, and 9 are waived.

Please sign the permit copies and return one for our files.

If you have any questions, please call Rae M. Loui, Deputy Director, at 587-0214 or 1-800-468-4644 extension 70214.

Aloha,

Michael D. Wilson  
Chairperson

Enclosures
**AFTER THE FACT WELL CONSTRUCTION PERMIT**

**MW 2-3 Well, Well No. 2902-03**

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management’s Administrative Rules, Section 13-168, entitled “Water Use, Wells, and Stream Diversion Works,” this document permits the construction and testing of MW 2-3 Well (Well No. 2902-03) at Schofield Barracks, Oahu, TMK 7-7-01, subject to the following conditions:

**STANDARD PERMIT CONDITIONS**

1. The Commission on Water Resource Management, P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work by this permit commences.

2. The well construction permit shall be for construction and testing of the well only. A minimum one-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Commission, to accurately record water levels. The permittee shall coordinate with the Commission and conduct a pumping test in accordance with the attached Aquifer Pump Testing Procedure (attached). The permittee shall submit to the Commission the test results as a basis for supporting an application to install a permanent pump and withdraw water for use. No permanent pump may be installed until a pump installation permit is approved and issued by the Commission.

3. 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.

4. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee shall stop work and contact the Department’s Historic Preservation Division (587-0045) immediately.

5. 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.

6. The following shall be submitted to the Commission within thirty (30) days from the date of approval:
   b. Elevation (referenced to mean sea level, ms) survey by a Hawaii-licensed surveyor.
   c. As-built sectional drawing of the well.
   d. Plot plan and map showing the exact location of the well.
   e. Complete pumping test records, including time, pumping rate, drawdown, chloride content, and other water quality data.

7. The permittee shall comply with all applicable laws, rules, and ordinances.

8. The well construction permit application is incorporated into the permit by reference.

9. The permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. 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 Commission upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

10. If the well is not to be used it must be properly capped. If the well is to be abandoned then the applicant must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

Date of Approval: 5/9/96
Expiration Date: 5/9/98

Michael D. Wilson, Chairperson
Commission on Water Resource Management

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed.

Applicant’s Signature: ____________________________ Date: __________

Printed Name: ____________________________ Firm or Title: ____________________________

Please sign both copies and return one copy of this permit to the Commission and retain a copy for your record.

Attachment

cc: USGS
Department of Health/ Safe Drinking Water & Wastewater Branches
Honolulu Board of Water Supply
Mr. Jon Fukuda  
United States Army  
DPW, Attn: APVG-GWV, U.S. Army Garrison  
Schofield Barracks, Hawaii  06857-5000

Dear Mr. Fukuda:

After-the-Fact Pump Installation Permit  
MW 2-3 (Well No. 2902-03)

Enclosed are two (2) copies of your approved Pump Installation Permit for the captioned well(s). As part of the Commission's approval, the following special conditions were added and are part of your permit under Standard Permit Condition 10:

Special Conditions

1. Standard Conditions 1 and 8 are waived.
2. The requirement to install a flowmeter (Standard Condition 3) is waived.

Please sign the permit copies and return one for our files.

If you have any questions, please call Rae M. Loui, Deputy Director, at 587-0214 or 1-800-468-4644 extension 70214.

Aloha,

[Signature]

MICHAEL D. WILSON  
Chairperson

Enclosures
AFTRAHE-FACT PUMP INSTALLATION PERMIT

MW 2-3 Well, Well No. 2902-03

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the pump installation for MW 2-3 Well (Well No. 2902-03) at Schofield Barracks, Oahu. TMK 7-7-01, subject to the following conditions:

STANDARD PERMIT CONDITIONS

1. The Commission on Water Resource Management, 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.

2. The pump installation permit shall be for installation of a 28 gpm capacity, or less, pump in the well.

3. The permittee shall provide and maintain an approved meter or other appropriate means for measuring and reporting withdrawals and water levels, and appropriate devices or means for measuring chlorides and temperature. These data shall be measured monthly and reported to the Commission on a monthly basis.

4. The proposed use 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 pump water from a well shall not constitute a determination of correlative water rights. The permittee is not required by this provision understands that the quantity of water taken from the well could be reduced by the Commission in the future. This permit is not a commitment that the pump capacity permitted here or even some lesser amount is guaranteed in the future.

5. The applicant shall complete and submit as-built drawings and Part II - (Permanent) Pump Installation Report of the Well Completion Report (attached) to the Commission within thirty (30) days from the date of approval.

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

7. The pump installation permit application is incorporated into the permit by reference.

8. The permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. 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 Commission upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

9. If the well is not to be used it must be properly capped. If the well is to be abandoned then the applicant must apply for a well abandonment permit in accordance with §13-168-12(f) prior to any well sealing or plugging work.

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

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Expiration Date: 5/9/98

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed.

Applicant's Signature: ___________________________ Date: __________
Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies and return one copy of this permit to the Commission and retain a copy for your record.

Attachment cc: USGS
Department of Health/ Safe Drinking Water & Wastewater Branches
Honolulu Board of Water Supply
TO:       Honorable Lawrence Miike, Director  
          Department of Health  
          Attention: Dennis Tulang, Wastewater Branch  
          William Wong, Safe Drinking Water Branch  
FROM:     Michael D. Wilson, Chairperson  
          Commission on Water Resource Management  
SUBJECT:  After-the-Fact Applications for Well Construction/Pump Installation Permits  
          MW2-1 through 2-5, MW4-2A, & MW4-4 Wells  
          Well Nos. 2900-02, 2903-01, 2902-03, 2801-02, 2959-01, 3004-05, & 3004-04  

Transmitted for your review and comment are copies of after-the-fact applications for well construction/pump installation permits.

We would appreciate your comments on the captioned applications for any conflicts or inconsistencies with the programs, plans, and objectives specific to your department. Please respond by returning this cover memo form by April 29, 1996.

Please find a map, attached, to locate the wells. If you have any questions about these permit applications, request additional information, or request additional review time, please contact Lenore Nakama at 587-0218.

RESPONSE:  () We have no comments  
           ( ) Comments attached  
Contact Person: Bill Ding  
Phone: 586-2258  
Signed: Bill Ding  
Date: 4/15/96
TO: Honorable Lawrence Miike, Director
   Department of Health
   Attention: Dennis Tulang, Wastewater Branch
           William Wong, Safe Drinking Water Branch

FROM: Michael D. Wilson, Chairperson
       Commission on Water Resources Management

SUBJECT: After-the-Fact Applications for Well Construction/Pump Installation Permits
         MW2-1 through 2-5, MW4-2A, & MW4-4 Wells
         Well Nos. 2900-02, 2903-01, 2902-03, 2901-02, 2959-01, 3004-05, & 3004-04

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We would appreciate your comments on the captioned applications for any conflicts or inconsistencies with the programs, plans, and objectives specific to your department. Please respond by returning this cover memo form by April 29, 1996.

Please find a map, attached, to locate the wells. If you have any questions about these permit applications, request additional information, or request additional review time, please contact Lenore Nakama at 587-0218.

LN:ss
Attachment(s)

RESPONSE: ☒ We have no comments
           ☐ Comments attached

Contact Person: Lori N. Kajiwara Phone: 587-0218
Signed: Lori N. Kajiwara Date: 4-12-96
Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV, U.S. Army Garrison  
Schofield Barracks, HI 96857-5000

Dear Mr. Fukuda:

Permit Applications for MW2-1 through 2-5, MW4-2A, & MW4-4  
(Well Nos. 2900-02, 2903-01, 2902-03, 2801-02, 2959-01, 3004-05, & 3004-04)

We accepted your after-the-fact well construction/pump installation permit applications on February 27, 1996, and hereby acknowledge that they are complete. You can expect your applications to be processed for action within ninety (90) days from that acceptance date.

We are returning your check for $175.00 because government agencies are not subject to the payment of any fees (§13-171-12(c) HAR).

Thank you for submitting the boring logs and well completion diagrams for Wells MW1-1, MW4-1, and MW4-3. We have reviewed the record for each of the monitor wells shown on your map. Listed below are the items that should be submitted to complete the record for the following wells:

1. MW1-1 (Well No. 2901-13)  
a. After-the-fact application for a well construction/pump installation permit.  
b. Well completion report (Parts I and II, attached)

2. MW4-2 (Well No. 3004-02)  
a. Well completion report (Parts I and II, attached)  
b. As-built sectional drawing of the well  
c. As-built sectional drawing of the pump

3. MW4-2 (Well No. 2900-01)  
a. As-built sectional drawing of the pump

4. MW4-4 (Well No. 3004-03)  
a. Well completion report (Parts I and II, attached)

In addition, documentation from a Hawaii-licensed surveyor should be submitted for all of your monitor wells.

If you have any questions, please contact Lenore Nakama at 587-0218.

Sincerely,

[Signature]

RAE M. LOUI  
Deputy Director

Enclosure
TO: Honorable Lawrence Miike, Director
    Department of Health
    Attention: Dennis Tulang, Wastewater Branch
              William Wong, Safe Drinking Water Branch

FROM: Michael D. Wilson, Chairperson
      Commission on Water Resources Management

SUBJECT: After-the-Fact Applications for Well Construction/Pump Installation Permits
          MW2-1 through 2-5, MW4-2A, & MW4-4 Wells
          Well Nos. 2900-02, 2903-01, 2902-03, 2801-02, 2959-01, 3004-05, & 3004-04

Transmitted for your review and comment are copies of after-the-fact applications for well construction/pump installation permits.

We would appreciate your comments on the captioned applications for any conflicts or inconsistencies with the programs, plans, and objectives specific to your department. Please respond by returning this cover memo form by April 29, 1996.

Please find a map, attached, to locate the wells. If you have any questions about these permit applications, request additional information, or request additional review time, please contact Lenore Nakama at 587-0218.

LN:ss
Attachment(s)

RESPONSE: ( ) We have no comments
          ( ) Comments attached

Contact Person: _________________________________ Phone: _________________________________

Signed: _________________________________ Date: _________________________________
Submitted for your review and approval are seven Applications for Permits and seven Well Completion Reports for monitoring wells MWs 2-1 through 2-5, MW4-2A, and MW4-4 that were installed for the Schofield Barracks Remedial Investigation/Feasibility Study (RI/FS) project. Also enclosed are boring logs and well completion diagrams for Wells MW1-1, MW4-1, and MW4-3, though they were previously permitted. We are conducting this project on behalf on the U.S. Army. Groundwater chemistry data for each of the wells are pending but will be published by the Army in the Final OU 2 RI Report. If requested, this data can be sent to you after release by the Army.

Also enclosed is a check for $175 (for seven well applications at $25 each).

If you have any questions, please contact me.

BSW/MWC/rmf

Enclosures:  Applications for Permit, Wells MW2-1 through MW2-5, MW4-2A, and MW4-4
Well Completion Reports, Wells MW2-1 through MW2-5, MW4-2A, and MW4-4
Monitoring Well Location Map, USGS Quadrangles
Tax Map Key
Table 1. Water-Level Data
Table 2. Location Coordinates of Wells Drilled at Schofield Barracks
Boring Logs and Well Completion Diagrams (also includes MWs 4-1, 4-3, and 1-1)
$175 Check Payment, Harding Lawson Associates
WELL COMPLETION REPORT

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

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 521, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 567-0225, or 1-800-468-9694 Ext 7-0223.

1. STATE WELL NO. 2902-03  WELL NAME MW-3 Wheeler AAF, ISLAND Oahu
2. LOCATION: Address Santos Dumont Ave. and Elleman Rd., Tax Map Key 7-7-01
3. DRILLING OR PUMP INSTALLATION CONTRACTOR Elmo Shephard
4. CONTRACTOR'S C-57 LICENSE NUMBER C-16437
5. NAME OF DRILLER WHO PERFORMED WORK Elmo Shephard
6. TYPE OF RIG/CONSTRUCTION Air Rotary/Star 150K
7. DATE OF WELL DRILLING COMPLETION 10/25/94

8. GROUND ELEVATION (msl) 827 ft.
   Top of Drilling Platform (msl) 829 ft.
   Height of Drilling Platform above Ground surface 2 ft.
   Bench Mark and Method Used to Determine Ground Elevation +866.38 ft. (differential leveling)

9. DRILLER'S LOG:

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<th>Water Level Dates (ft.)</th>
<th>Depth (ft.)</th>
<th>Rock Description, Remarks, Dates (ft.)</th>
<th>Water Level Dates (ft.)</th>
<th>Rock Description, Remarks, Dates (ft.)</th>
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<tbody>
<tr>
<td>to</td>
<td></td>
<td>See attached boring log</td>
<td>to</td>
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<td>to</td>
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<td>to</td>
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<td>(If more space is needed, continue on back.)</td>
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<td></td>
</tr>
</tbody>
</table>

10. TOTAL DEPTH OF WELL BELOW GROUND 720 ft.
11. HOLE SIZE:
   18 inch dia. from 0 ft. to 28 ft. below ground
   13 inch dia. from 28 ft. to 720 ft. below ground
12. CASING INSTALLED:
   6 in. I.D. x 0.28 in. wall solid section to 543 ft. below ground
   6 in. I.D. x 0.25 in. wall perforated section to 693 ft. below ground
   Type of Perforation Horizontal louvered openings
13. ANNULUS:
   Grouted from 0 ft. below ground to 510 ft. below ground
   Gravel packed from 520 ft. below ground to 720 ft. below ground
14. INITIAL WATER LEVEL 553 ft. below ground. Date and time of measurement 0818 hrs., 12/05/94
15. INITIAL CHLORIDE 17 ppm Date and time of sampling 1209 hrs., 05/31/95
16. INITIAL TEMPERATURE 72.5 °F Date and time of sampling 1057 hrs., 05/31/95
17. PUMPING TESTS:
   Reference Point (R.P.) used: __________, which elevation is ________ ft.
   Date __________
   Start water level ______ ft. below R.P. Start water level ______ ft. below R.P.
   End water level ______ ft. below R.P. End water level ______ ft. below R.P.
   Depth of well ______ ft. below R.P. Depth of well ______ ft. below R.P.
18. AQUIFER PUMP TEST PROCEDURES DATA & GRAPHS ATTACHED? Yes _ No

PUMP INSTALLATION REPORT

19. DATE OF PUMP INSTALLATION 5/12/95
20. PUMP INSTALLATION:
   Submersible, Meyers,
   Make: 3JFL7543-258
   Capacity 25 gpm
   Motor type, H.P., Voltage, rpm Franklin Electric, 7.5 HP, 460V, 1760 RPM
   Depth of Pump Intake Setting 636 ft. below ground, which elevation is 191 ft.
   Depth of bottom of airline N/A ft. below ground, which elevation is ______ ft.
   Pumping Head is 558 ft.

Remarks:

Contractor (print) Roscoe Moss Hawaii Inc.
Title Manager
Signature
Date 2/15/95

For Driller's Use:
Job Name __________
Job No. __________

For Official Use:
Well No. 2902-03
Well Type __________
Well Location AAF 03
Latitude 21° 29' 04"
Longitude 158° 02' 51"

12/12/95 WCR Form
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<th>Date Measured</th>
<th>Time Measured</th>
<th>Top of Sounding Tube Elevation (Ft)</th>
<th>Depth to Water (Ft)</th>
<th>Vertical Displacement (Ft)</th>
<th>Corrected Depth (Ft)</th>
<th>Groundwater Elevation (Ft)</th>
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NA = Not assigned yet by the DLNR.
TOP OF SOUNDING TUBE
EL. = 828.81 FT.

GROUND SURFACE
EL. = 827 FT

3.5" DIAMETER STEEL PICKET FILLED WITH CEMENT

18" DIAMETER AUGERED HOLE

14" DIAMETER STEEL SURFACE CASING
CEMENT BENTONITE INNER SEAL

6" DIAMETER CARBON STEEL BLANK CASING

13" DIAMETER HOLE DRILLED WITH AIR ROTARY
CEMENT BENTONITE INNER SEAL

510  317
520  307
535  292
543  284
557.55 271.26 (10/10/95)
(ELEVATION OF GROUNDWATER)
573  254
693  134
695  132
720  107

(BOTTOM 30' PERFORATED)

SAND

BENTONITE PELLETS
FINE SAND

6" PVC SOUNDER TUBE
(BOTTOM 30' PERFORATED)

799

SILICA SAND FILTER PACK
(#4 STANDARD SIEVE SIZE)

6" DIA. STAINLESS STEEL LOUVERED SCREEN (0.060" SLOT SIZE)

(NOT TO SCALE)

*DATUM: MEAN SEA LEVEL

Monitoring Well 2-3
Schofield Barracks
Island of Oahu, Hawaii
3-2902-03

Harding Lawson Associates
Engineering and Environmental Services

Drawn: jcl
Job Number: 28339.09.02.12
Approved: 2833900710
File: 19991016442
Date: 9/95

PUMP SEC. OVER
DEPTH (FT)  ELEVATION (FT)*

535    292

557.55 271.26 (10/10/95) \(\uparrow\)
(ELEVATION OF GROUNDWATER)

573    254

FINE SAND

1" DIA. SCH 80 PVC SOUNDING TUBE

1.5" DIA. STEEL DISCHARGE PIPE

JACKETED SUBMERSIBLE ELECTRICAL PUMP CABLE

STAINLESS STEEL SAFETY CABLE

CHECK VALVE

STAINLESS STEEL ELECTRICAL CABLE

WIRE GUARD

RUBBER TORQUE ARRESTOR

3.75" DIA. MYERS PUMP

PUMP INTAKE

3.75" DIA. FRANKLIN 7.5 HORSEPOWER ELECTRIC MOTOR

SILICA SAND FILTER PACK

6" DIA. STAINLESS STEEL LOUVERED SCREEN

10" DIA. HOLE DRILLED WITH AIR ROTARY

SAND

*DATUM: MEAN SEA LEVEL

(NOT TO SCALE)
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./5 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
<th>Sample Number</th>
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<td>2-12</td>
<td>-</td>
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<td>0</td>
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<td>18-25</td>
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<td>4</td>
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<td>25-40</td>
<td>11</td>
<td>0</td>
<td>5</td>
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</tr>
<tr>
<td>50-60</td>
<td>3</td>
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<td>7</td>
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**Equipment**

<table>
<thead>
<tr>
<th>Air Rotary/Star 150K</th>
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<tr>
<td><strong>(Ground) Elevation</strong></td>
</tr>
<tr>
<td>827 ft Date 10/25/94</td>
</tr>
</tbody>
</table>

**Log of Monitoring Well 2-3 (Sheet 1 of 12)**

**Figures**

- Very dark reddish brown elastic silt (MH) (2.5YR,2.5/2), dry, firm, some small cobble- to boulder-size fragments of concrete between 2 and 4 feet.
- Moist below 5 feet.
- Three-inch piece of steel encountered at 7 feet.
- Dark reddish brown (2.5YR,3/4) below 10 feet.

- Medium gray (N5) basalt boulder, low to medium hardness, weak to moderately strong, moderate to deeply weathered. Boulder.

- (Driller switched from Kelley bar and auger to air rotary at 27.5 feet. Set 14-inch surface casing to 27.5 feet.)
- Dark brown elastic silt (MH) (7.5YR,3/4), moist, firm.
- Dark brown (7.5YR,3/4) below 40 feet.
- Dark red (10R,3/6) below 50 feet.
- Mottled red (10R,4/6) and light olive brown (2.5Y,5/4) below 60 feet.
### Log of Monitoring Well 2-3
#### (Sheet 2 of 12)

<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./15 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
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<td>7</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>70-80</td>
<td>4</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>80-90</td>
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<td>0</td>
<td>10</td>
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<td>90-100</td>
<td>6</td>
<td>0</td>
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<td>100-110</td>
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<td>0</td>
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</tr>
<tr>
<td>110-120</td>
<td>2</td>
<td>0</td>
<td>13</td>
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**Equipment**
- **Equipment (Ground Elevation)**
  - **Equipment:** Air Rotary/Star 150K
  - **Ground Elevation:** 827 ft
  - **Date:** 10/25/94

**Description of Soil Layers**

- **60-70 feet:**
  - Dusky red (2.5YR,3/2) below 70 feet.

- **70-80 feet:**
  - Mottled red (10R,4/6) and strong brown (7.5YR,4/6), trace of basalt below 80 feet.

- **80-90 feet:**
  - Mottled red (10R,4/6) and brown (7.5YR,5/4) below 90 feet.

- **90-100 feet:**
  - Mottled dark yellowish brown (10YR,4/4), dark gray (2.5YR,N4) and red (2.5YR,4/6) below 100 feet.

- **100-110 feet:**
  - Dark brown (7.5YR,4/2) and red (2.5YR,4/6) (saprolite) below 110 feet.

- **110-120 feet:**
  - Decreased drilling resistance from 116 to 121 feet.
  - MODERATE REDDISH BROWN (10R,4/6), MODERATE YELLOWISH BROWN (10YR,5/4), GRAYISH BLACK (N2) AND OLIVE GRAY (5Y,4/1) BASALT, low hardness, friable to weak, deeply weathered.
  - Decreased drilling resistance from 126 to 135 feet.
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<thead>
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<th>Drilling Rate (min./15 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
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<td>4</td>
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<td>135</td>
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<td>15</td>
<td>140</td>
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**Equipment**

Air Rotary/Star 150K

**Ground Elevation**

827 ft  Date  10/25/94

**Log of Monitoring Well 2-3**

*Sheet 3 of 12*

**Schofield DA03**

Schofield Barracks
Island of Oahu, Hawaii

**Approved File**

SDA03  4/95

**Revised Date**

3-29-02-03

**Drawing Date**

28339.06.01.12

**Drawing**

kar

**Harding Lawson Associates**

Engineering and Environmental Services

**Figure**

Dark gray (N3) and olive gray (5Y.4/1), low to moderate hardness, weak, moderate to deeply weathered, iron-oxide staining, vesicular below 130 feet.

Dark greenish gray (5GY.4/1) and dark gray (N3), weak to moderately strong below 140 feet.

Dark gray (N3) and olive gray (5Y.4/1), trace calcite below 150 feet.

Low hardness, weak, no calcite at 160 feet, increased drilling resistance from 160 to 174 feet.

Dark gray (N3) and dark greenish gray (5GY.4/1), hard to moderately hard, moderately strong, moderate weathering below 170 feet.

Dark gray (N3) and olive gray (5Y.4/1), low to moderate hardness, weak to moderately strong below 180 feet.

Grayish black (N2), moderately hard to hard, moderately strong, moderate to deeply weathered, highly vesicular below 190 feet.
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<td>210</td>
<td>Dark grey (N3) and grayish black (N2), hard, moderately strong to strong, moderate to deeply weathered below 210 feet. Decreased drilling resistance at 212 feet.</td>
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<td>Moderately hard to hard with increasing olivine crystals. Increased drilling resistance from 244 to 248 feet. Olive black (5Y,2/1), moderate to low hardness, weak to moderately strong, moderately to deeply weathered, highly vesicular below 250 feet.</td>
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<td>250</td>
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<td>295</td>
<td></td>
</tr>
<tr>
<td>290-300</td>
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<td>0</td>
<td>31</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>305</td>
<td></td>
</tr>
<tr>
<td>300-310</td>
<td>22</td>
<td>0</td>
<td>32</td>
<td>310</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>315</td>
<td></td>
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<tr>
<td>310-320</td>
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<td>0</td>
<td>33</td>
<td>320</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Equipment**

Air Rotary/Star 150K

**Sample Number**

Log of Monitoring Well 2-3 (Sheet 5 of 12)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Air Rotary/Star 150K</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Ground)</td>
<td>827 ft</td>
</tr>
<tr>
<td>Elevation</td>
<td>Date 10/25/94</td>
</tr>
</tbody>
</table>

Greyish brown (5YR,3/2) and greyish black (N2), moderately hard to hard, weak, moderately weathered, trace olivine crystals, and inclusions of dark red (2.5YR,3/8) elastic silt below 260 feet.

Dark grey (N3), moderately hard, moderately strong, moderate to deeply weathered below 270 feet.

Increased drilling resistance from 274 to 318 feet.

No olivine crystals at 280 feet.

Hard, moderate to deeply weathered, trace olivine, vesicular, below 290 feet.

Highly vesicular below 300 feet.

Olive black (5GY,2/1), hard, with some olivine crystals below 310 feet.

Greyish black (N2) and dark gray (N3), moderately hard, weak to moderately strong, vesicular below 320 feet.
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./5 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
<th>Sample Number</th>
<th>Depth (ft)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>320-330</td>
<td>11</td>
<td>0</td>
<td>34</td>
<td>330</td>
<td>Increased drilling resistance at 329 feet.</td>
</tr>
<tr>
<td>330-340</td>
<td>14</td>
<td>0</td>
<td>35</td>
<td>340</td>
<td>Olive gray (5Y,4/1), moderately hard to hard, moderately strong, highly vesicular, with some olivine crystals below 340 feet.</td>
</tr>
<tr>
<td>340-350</td>
<td>13</td>
<td>0</td>
<td>36</td>
<td>350</td>
<td>Increased drilling resistance from 345 to 347 feet.</td>
</tr>
<tr>
<td>350-360</td>
<td>15</td>
<td>0</td>
<td>37</td>
<td>360</td>
<td>Grayish black (N2) and olive gray (5Y,4/1), moderately hard, vesicular, trace calcite and inclusions of dark reddish brown (5YR,3/4) elastic silt below 350 feet.</td>
</tr>
<tr>
<td>360-370</td>
<td>5</td>
<td>0</td>
<td>38</td>
<td>370</td>
<td>No calcite below 360 feet.</td>
</tr>
<tr>
<td>370-380</td>
<td>6</td>
<td>0</td>
<td>39</td>
<td>380</td>
<td>Dark gray (N3) and dark reddish brown (10R,4/6), low hardness, weak to moderately strong, highly vesicular below 370 feet. (Loss of drilling foam circulation from 370 feet to the depth of the boring.)</td>
</tr>
</tbody>
</table>

**Equipment**

- **Equipment**: Air Rotary/Star 150K
- **Ground Elevation**: 827 ft
- **Date**: 10/25/94

---

**Log of Monitoring Well 2-3**

- **Sheet**: 6 of 12
- **Company**: Harding Lawson Associates
- **Address**: Schofield Barracks, Island of Oahu, Hawaii

**Drawn by**: kar

**Job Number**: 28339.06.01.12

**Approved**: SDA03

**File Date**: 4/95
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./5 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
<th>Sample Number</th>
<th>Depth (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>380-390</td>
<td>14</td>
<td>0</td>
<td>40</td>
<td>390</td>
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<tr>
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<td>400-410</td>
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<td></td>
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<tr>
<td>410-420</td>
<td>8</td>
<td>0</td>
<td>43</td>
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<td></td>
<td>425</td>
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<td>0</td>
<td>44</td>
<td>430</td>
</tr>
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<td></td>
<td></td>
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<td>435</td>
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<td>430-440</td>
<td>18</td>
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<td></td>
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<td></td>
<td>445</td>
</tr>
<tr>
<td>440-450</td>
<td>23</td>
<td>0</td>
<td>46</td>
<td>450</td>
</tr>
</tbody>
</table>

Increased drilling resistance from 433 to 436 feet.

Increased drilling resistance from 441 to 458 feet.
### Log of Monitoring Well 2-3 (Sheet 8 of 12)

<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./5 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
<th>Sample Number</th>
<th>Depth (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>450-460</td>
<td>5</td>
<td>0</td>
<td>47</td>
<td>455</td>
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<td>15</td>
<td></td>
<td></td>
<td>460</td>
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<tr>
<td>460-470</td>
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<td>0</td>
<td>48</td>
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</tr>
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<tr>
<td>480-490</td>
<td>17</td>
<td>0</td>
<td>50</td>
<td>485</td>
</tr>
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<td></td>
<td>14</td>
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<td>490</td>
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<td>51</td>
<td>495</td>
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<td>8</td>
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<td>500-510</td>
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<td></td>
<td>26</td>
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</table>

Increased drilling resistance from 464 to 467 feet.

Increased drilling resistance from 482 to 494 feet.

Increased drilling resistance from 507 to 515 feet.
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./1.5 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
<th>Sample Number</th>
<th>Depth (ft)</th>
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<tbody>
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<td>-</td>
<td>0</td>
<td>53</td>
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<td>530-540</td>
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<td>14</td>
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<td>57</td>
<td>560</td>
</tr>
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<td>565</td>
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<td>19</td>
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<tr>
<td>570-580</td>
<td>-</td>
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<td>59</td>
<td>580</td>
</tr>
</tbody>
</table>

**Equipment**

**Air Rotary/Star 150K**

**Ground Elevation**

827 ft  

**Date**

10/25/94

- Increased drilling resistance from 529 to 539 feet.

- Increased drilling resistance from 547 to 550 feet.

- Water table measured at 553.04 feet below ground surface 12/5/94, 08:18. Decreased drilling resistance from 554 to 566 feet.

- (Driller notes that formation is loose and highly fractured at 568 feet.)

- Decreased drilling resistance from 581 to 590 feet.
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./5 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
<th>Sample Number</th>
<th>Depth (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>580-590</td>
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<td>60</td>
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<td>590-600</td>
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<td>590</td>
</tr>
<tr>
<td>600-610</td>
<td>20</td>
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<td>62</td>
<td>595</td>
</tr>
<tr>
<td>610-620</td>
<td>9</td>
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<td>600</td>
</tr>
<tr>
<td>620-630</td>
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<td>64</td>
<td>605</td>
</tr>
<tr>
<td>630-640</td>
<td>2</td>
<td>0</td>
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<td>13</td>
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<td></td>
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</tbody>
</table>

Decreased drilling resistance from 595 to 625 feet.

Decreased drilling resistance from 630 to 644.5 feet.
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./3 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
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<td>670-680</td>
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<td>695-700</td>
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<tr>
<td></td>
<td>7</td>
<td></td>
<td></td>
<td>710-715</td>
</tr>
</tbody>
</table>

**Equipment**

Air Rotary/Star 150K

**Ground Elevation**

827 ft

**Date**

10/25/94

---

Decreased drilling resistance from 649 to 649.5 feet.

Decreased drilling resistance at 673 feet.

Decreased drilling resistance from 697 to 711 feet.
<table>
<thead>
<tr>
<th>Sample Interval (feet)</th>
<th>Drilling Rate (min./5 feet)</th>
<th>Breathing Space Measurement (ppm)</th>
<th>Sample Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>710-720</td>
<td>9</td>
<td>0</td>
<td>73</td>
</tr>
</tbody>
</table>

**Equipment**

- **Air Rotary/Star 150K**

**Ground Elevation**

- **827 ft**

**Date**

- **10/25/94**

---

Total depth = 720 feet.

Water table was measured at 553.04 feet below ground surface, 12/5/94, 08:18.
APPLICATION FOR PERMIT

1. APPLICANT: (circle primary contact (a), (b), or (c))
   (a) WELL OWNER
   Firm/Name: U.S. Army
   Contact Person: Jon Fukuda
   Address: DPW, Attn: APVO-GWV, U.S. Army
   Schofield Barracks, Garrison
   Hawaii 96857-5000
   (b) LANDOWNER
   Firm/Name: SAME AS WELL OWNER
   Contact Person: Ph
   Address: ____________
   (c) CONTRACTOR
   Firm/Name: Roscoe Moss Hawaii, Inc.
   Contact Person: Tracy Runnels
   Address: 92-159A Olai St., Kapolei, Hawaii 96707

2. WELL LOCATION/NAME: Wheeler Army Air Field/NW2-3
   Island: Oahu
   Address: Santos Dumont Avenue and Elleman Road,
   Wheeler AAF, Hawaii 96786
   (Attach a USGS map, scale 1:20000, and a property tax map showing well location referenced to established property boundaries.)

3. (a) PROPOSED WORK: DIll New Well
   - [ ] Deepen
   - [ ] Install New Pump
   - [ ] Modify Existing Well
   - [ ] Redrill
   - [ ] Modify Pump
   - [ ] Abandon/Seal *
   - [ ] Replace Pump

   * Be sure to complete and submit well abandonment report upon completion of work.

   (b) WELL TYPE:
   - [ ] Dug
   - [ ] Bored
   - [ ] Driven
   - [ ] Drilled
   - [ ] Radial

   Is this well a part of a battery of wells?  [ ] Yes, [ ] No
   (Briefly describe and fill in the diagram on the back of this form.)

4. PROPOSED PUMP INFORMATION: Rated Pump Capacity: _______ 25 gallons per minute
   Pump Type:
   - [ ] Deep Well Turbine
   - [ ] Rotary
   - [ ] Propeller
   - [ ] Diesel
   - [ ] Submersible
   - [ ] Rotary-Displacement
   - [ ] Reciprocating
   - [ ] Gas
   - [ ] Centrifugal
   - [ ] Rotary-Gear
   - [ ] Impulse
   Motor:
   - [ ] Electric, rated horsepower: _______ 7.5

   If Pump Replacement, Existing Pump Capacity: _______ gallons per minute

5. PROPOSED USE:
   - [ ] Municipal (including hotels, stores, etc.)
   - [ ] Military
   - [ ] Domestic (individual, noncommercial water use)
   - [ ] Industrial
   - [ ] Irrigation (crop)
   - [ ] Other (explain)

6. (a) PROPOSED AMOUNT OF WITHDRAWAL:
   _______ gallons per day
   (b) METHOD OF FLOW MEASUREMENT:
   - [ ] Flow-meter
   - [ ] Open-pipe
   - [ ] Orifice Plate
   - [ ] Weir

7. PENDING ACTIONS:
   - [ ] CDUA
   - [ ] SMA
   - [ ] EIS
   - [ ] EA
   - [ ] NONE
   - [ ] Other (explain)
   Completion Date:

8. REMARKS, EXPLANATIONS:
   Well shall be used for monitoring of groundwater quality and for collecting groundwater elevation data.
   If more space is needed, continue on back

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two (2) years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 30 days after the completion date of the permitted work; 3) monthly water use data shall be submitted to the Commission; 4) such approval shall not constitute a determination of correlating water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: ___________________ Landowner: ___________________ Contractor: ___________________
Signature: ___________________ Signature: ___________________ Signature: ___________________
Date: 21 act 5 76 Date: Date: ___________________

For Official Use Only:
Date Received: ___________________
Date Accepted: ___________________
Field Checked By: ___________________
Signature: ___________________
Date: ___________________
Longitude: ___________________
Latitude: ___________________
Aquifer System Name: ___________________
State Well No: ___________________

11/09/95 WCPI Form
9. PROPOSED WELL SECTION

Elevation at top of casing
829 ft, msl.

Cement Grout: 510 ft.

Bentonite Seal: 10 ft.

Rock Packing: 200 ft.

Hole Diameter: 13 in.

Total Depth: 720 ft.

Ground Elevation: 827 ft, msl

Solid Casing:
- Material: carbon steel
- Length: 565 ft
- Diameter: 6 in
- Wall thickness: 0.28 in

Casing: Perforated Screen (louvered)
- Material: stainless steel
- Length: 150 ft
- Diameter: 6 in
- Wall thickness: 0.25 in
- Openings: 2.4 sq. in. A/F

Open Hole:
- Length: 0 ft
- Diameter: in

*Approximate elevation at time of filing application. Ground elevation above mean sea level (msl) by a surveyor licensed by the State must be submitted at start of construction. Final elevations of well components shall be submitted in the well completion/well abandonment reports.