**SECTION 1: WELL LOCATION INFORMATION**

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
<th>Proposed Use</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIANAE</td>
<td>Proposed Withdrawal</td>
<td>0</td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>######</td>
<td>System Sustainable Yield</td>
<td>4</td>
</tr>
</tbody>
</table>

**SECTION 2: WELL SECTION DATA**  
(enter data in grey cells only)

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>Solid Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>Material</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>Designation</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>Length</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>Diameter</td>
</tr>
<tr>
<td>Total Depth</td>
<td>Wall Thickness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Head</th>
<th>Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>Material</td>
</tr>
<tr>
<td>County Water Supply (Y/N ?)</td>
<td>Designation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hole Diameter</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Depth</td>
<td>Diameter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hole Diameter</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Depth</td>
<td>Square Foot</td>
</tr>
</tbody>
</table>

**SECTION 3: CHECKLIST**  
(values to check are shaded)

**Well Depth**
- Theoretical Thickness of Aquifer 1025 ft.
- 1/4 Aquifer Thickness 256.3 ft.
- Depth of Well below Sea Level 25 ft.  
  - okay  (refer to HWCPIS Section 2.2)  
  - (disregard if the well is not basal)

**Well Casing**
- Minimum Wall Thickness
  - Material PVC
  - County or Non-County non-county
  - Minimum Thickness per standards 0.237 in.
  - Wall Thickness Provided 0.406 in.  
  - okay  (refer to HWCPIS Section 2.4 c)  
  - (disregard this if this is a non-county well)
- Minimum Length of Solid Casing 157.5 ft.
- 90% of ground to top of aquifer
- Length of solid casing Provided 170 ft.  
  - okay  (refer to HWCPIS Section 2.4 d)  
  - (disregard this if this is a non-county well)
- Casing Material Sch 40

**Annular Space**
- Depth of Grouting 122.5 ft.
- Calculated Depth of Grouting
- Depth of Grouting provided 165 ft.  
  - okay  (refer to HWCPIS Section 2.6 c)  
  - (refer to HWCPIS Section 2.6 d)
- Thickness of Annular Space 3 in.  
  - okay  (refer to HWCPIS Section 2.6 d)
December 8, 2004

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Completion Reports for Well Nos. 3113-02 to 06, 3213-08 to 11

We received your Well Completion Reports Part I for the ERDC Monitor Wells (Well Nos. 3113-02 to 06, 3213-08 to 11) on December 2, 2004 and acknowledge that they are complete.

If you have any questions, please contact Lenore Y. Nakama of the Commission staff at 587-0218.

Sincerely,

YVONNE Y. IZU
Deputy Director

LYN:ss

c: Floyd A. Quintana, Colonel, US Army, Director of Public Works, US Army Garrison
Steve Turnbull, US Army Garrison
Ms. Lenore Nakama  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

Dear Ms. Nakama:

Please find enclosed signed well construction permits and well completion reports for monitoring wells installed at the Makua Military Reservation as part of the Environmental Impact Statement (EIS) Process. We are planning to submit the EIS document for public review in the near future.

Please note that by submitting these well permits and well construction logs the Army is not waiving sovereign immunity; rather, that we are providing the completed application for informational purposes to the State of Hawaii Department of Land and Natural Resources.

If you have any questions, please contact Mr. Stephen Turnbull at 808-656-2878 ext. 1042.

Sincerely,

Floyd A. Quintana  
Colonel, US Army  
Director of Public Works
### WELL COMPLETION REPORT - PART I

**Well Construction**

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at [http://www.hawaii.gov/dlnr/cwm/](http://www.hawaii.gov/dlnr/cwm/).

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Well No.</td>
<td>3113-02</td>
</tr>
<tr>
<td>Well Name</td>
<td>ERDC-MW-1</td>
</tr>
<tr>
<td>Island</td>
<td>Oahu</td>
</tr>
<tr>
<td>Address</td>
<td>Makua Military Reservation</td>
</tr>
<tr>
<td>Tax Map Key</td>
<td>8-2-01:24</td>
</tr>
<tr>
<td>Drilling Company</td>
<td>Valley Well Drilling</td>
</tr>
<tr>
<td>Drilling method used during construction</td>
<td>Rotary</td>
</tr>
<tr>
<td>Date Well Construction (drilled,cased,grouted) completed</td>
<td>9/24/2002</td>
</tr>
<tr>
<td>Island</td>
<td>Oahu</td>
</tr>
<tr>
<td>Date and time of measurement</td>
<td>9/14/02 10:15</td>
</tr>
<tr>
<td>Initial water-level encountered</td>
<td>7.5 ft. below ground</td>
</tr>
<tr>
<td>Date and time of measurement</td>
<td>9/14/02 10:15</td>
</tr>
<tr>
<td>Step-Drawdown Test completed?</td>
<td>No</td>
</tr>
<tr>
<td>Date and time of measurement</td>
<td>9/14/02 10:15</td>
</tr>
<tr>
<td>Constant Rate Aquifer Test completed?</td>
<td>No</td>
</tr>
<tr>
<td>Date and time of measurement</td>
<td>9/14/02 10:15</td>
</tr>
<tr>
<td>Water-level</td>
<td>43.5 ft. above msl</td>
</tr>
<tr>
<td>Date and time of measurement</td>
<td>4/2/2003 8:50</td>
</tr>
<tr>
<td>Chloride</td>
<td>188 ppm</td>
</tr>
<tr>
<td>Date and time of sampling</td>
<td>12/18/02 11:55</td>
</tr>
<tr>
<td>Temperature</td>
<td>79 °F</td>
</tr>
<tr>
<td>Date and time of measurement</td>
<td>12/18/02 11:55</td>
</tr>
<tr>
<td>Remarks</td>
<td>No pump installed. Well for sampling</td>
</tr>
</tbody>
</table>

**Licensed Driller** (print) Mike Sober  
Signature [Signature]  
Date 11/16/04  
C-57 Lic. No. 21358

**Surveyor** (print)  
Signature  
L.P.L.S. Lic. No.  
Date

**Permittee** (print) COL Floyd A. Quintana, DPW, USAG-HI  
Signature  
Date 10/7/04  
WCR1 Form 9/29/00
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

**Solid Casing Material:**
- Carbon Steel: compliant (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one)
  - □ Filament Wound Resin Pipe conforming to ASTM D2996
  - □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ FEP Fluorocarbon Tubing conforming to ASTM D3296

**Open Casing Material:**
- Carbon Steel: compliant (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one)
  - □ Filament Wound Resin Pipe conforming to ASTM D2996
  - □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ FEP Fluorocarbon Tubing conforming to ASTM D3296

---

**HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS**

Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.

- Solid Casing: (≥ 90% x (Ground Elev.-Water Level Elev.))
  - Length: __ ft.
  - Nominal Diameter: __ ft.
  - Well Thickness: __ in.
  - Bottom Elevation: __ ft., msl

- Open Casing: (check one)
  - □ Perforated □ Screen
  - Length: __ ft.
  - Nominal Diameter: __ ft.
  - Well Thickness: __ in.
  - Bottom Elevation: __ ft., msl

- Open Hole: (filled with gravel)
  - Length: __ ft.
  - Diameter: __ in.
  - Bottom Elevation: __ ft., msl

**Ground Elevation:** __ ft., msl at __ in., ft.

**Minimum of 2' Radius:** __ ft.

**Total Depth:** __ ft.

**Rock or Gravel Packing:** __ ft.

**Water Level Elevation:** __ ft., msl

**Annular space between hole and casing (min.3.):** __ ft.

**Elevation at top of casing:** __ ft., msl

**Cement Grout:** __ ft. (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

**Bench mark elevation:** __ ft., msl (Survey to nearest 0.01 ft.)

*msl = mean sea level
<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>Sand with basalt cobbles,</td>
<td>9/19/02</td>
</tr>
<tr>
<td>5 to 20</td>
<td>Silty sand with basalt cobbles,</td>
<td>9/19/02</td>
</tr>
<tr>
<td></td>
<td>water level approx 7.5 ft</td>
<td></td>
</tr>
<tr>
<td>20 to 36</td>
<td>Sand with trace basalt fragments</td>
<td>9/19/02</td>
</tr>
</tbody>
</table>

Remarks:
HNu readings all background.
Monitoring Well Coordinates

Well MW-1 (3113-02)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 37” Longitude (W) 158° 13’ 38”

Ground Elevation: 9.95 feet

Top of Casing Elevation: 12.90 feet

Coordinates are referred to the North American Datum of 1983 (NAD83).
Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
Geologic Log
Well No. 3113-02

Drilling Log
Drilling agency: Valley Drilling
Name of Driller: John Suri
Manufacturer's designation of drill: Mobile B-90
Total No. of overburden samples taken: Disturbed 3
GPS Coord. N 21 deg. 31.814' W 118 deg. 13.13.628'

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SAND (SP) Black w/ basalt cobbles. Very hard drilling - bit chattered on rocks. Small amt of limestone cobbles present @ 2-3.0 ft</td>
<td>HNU - 0.0 SC:LL - 0 counts</td>
<td>SC:LL - 0 counts (backs round)</td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td></td>
<td>First clearance. No detect - drilling ahead.</td>
<td></td>
<td>Note: Run 3 in PVC Pipe to 3.0 ft to clear. Run device inside PVC pipe to clear.</td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Rock drilled through - very slow drilling</td>
<td>Blow Counts #1</td>
<td>FEREX 4.021</td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>Silty sands (SP-SM), dark black w/ cobbles &amp; frags of basalt &amp; limestone (damp)</td>
<td>20</td>
<td>Sampled w/ 2&quot; sampler MW-1</td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>Second clearance. No detect - drilling ahead.</td>
<td>HNU - 0.0 SC:LL - 0 counts</td>
<td>5.0' - 6.0' Good recovery.</td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td>As above</td>
<td>20</td>
<td>7.5 ft Approx. water table</td>
</tr>
<tr>
<td>-12</td>
<td></td>
<td>Third clearance. No detect - drilling ahead. HNU - 0.0 ppm SC:LL - 0 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td></td>
<td>AA - wet</td>
<td>MW-2</td>
<td>Sample 10.0' - 11.5' Bottom part of sample is wet. Water table is approx. 15.0'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fourth clearance. No detect - drilling ahead. Drilling smooth, below water table.</td>
<td>8</td>
<td>15.0' end of UXO clearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fifth clearance. No detect - drilling ahead. HNU - 0.0 ppm SC:LL - 0 counts</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Vertical Hole No. ERDC MW-1

Makua Military Reservation
Size and Type of Bit: 7" 3 way
Datum for elevation shown: MSL
Date Started: 9/19/02
Completed: 9/19/02
Total Depth of Hole: 35 ft
Elevation ground water: 7.5 ft
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-16</td>
<td>Smooth drilling. No chattering. Sand (SP) w/ trace of basalt frags from cuttings rec. from auger</td>
</tr>
<tr>
<td>-18</td>
<td>Sand (SP) black w/ trace of basalt frags. (from auger), wet. Some clay (CL) present. Drilling smooth.</td>
</tr>
<tr>
<td>-20</td>
<td>Drilling smooth</td>
</tr>
<tr>
<td>-22</td>
<td>Sand (SP) from auger, wet w/ CL</td>
</tr>
<tr>
<td>-24</td>
<td>Drilling smooth</td>
</tr>
<tr>
<td>-26</td>
<td>Sand (SP) from auger, wet w/ CL</td>
</tr>
<tr>
<td>-28</td>
<td>AA drilling smooth</td>
</tr>
<tr>
<td>-30</td>
<td>Drilling smooth</td>
</tr>
<tr>
<td>-32</td>
<td>Note: Smooth drilling from 15' - 35' indicates sand with some CL present.</td>
</tr>
</tbody>
</table>
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Elevation = 10.0 ft.

Bentonite Pellet Seal (Minimum 2' Thick)

Bentonite Concrete Grout Backfill

Borehole Diameter (10" Minimum)

#3 Sand

4" Diameter PVC Schedule 40 Riser Pipe

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)

Title: Well Construction Log ERDC-MW-1

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

DR BY: RSS 01-30-04
CHK BY: SJT 01-30-04
WELL CONSTRUCTION PERMIT
ERDC-MW-1, Well No. 3113-02

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-1 (Well No. 3113-02) at Makua Military Reservation, Oahu, TMK 3-2-01-24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1 inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation Program immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: [Signature]
Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI
Driller's Signature: [Signature]
Printed Name: Mike Sibor Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
# WELL COMPLETION REPORT - PART I

**Well Construction**

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

### 1. State Well No.: 3113-03  
Well Name: ERDC-MW-4A  
Island: Oahu

### 2. Address: Makua Military Reservation  
Tax Map Key: 8-2-01:24

### 3. Drilling Company: Valley Well Drilling

### 4. Drilling method used during construction:  
- ✔ Rotary  
- □ Percussion  
- □ Other (describe)

### 5. Date Well Construction (drilled, cased, grouted) completed:  
- 9/30/02  
- Fill out attached Driller's Log

*In addition to the driller’s log, if a geologic log was prepared, please submit with this form.*

### 6. Was the subject well cored?  
- □ Yes  
- ☑ No

### 7. Initial water-level encountered:  
- ft. below ground  
- Date and time of measurement:  
- month/day/year time

### 8. Step-Drawdown Test completed?  
- □ No  
- ☑ Yes  
- Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

### 9. Constant Rate Aquifer Test completed?  
- □ No  
- ☑ Yes  
- Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

### Parameters prior to pump test:

#### 10. Water-level:  
- 4.02 ft. above msl  
- Date and time of measurement:  
- 4/3/2003 9:30  
- month/day/year time

#### 11. Chloride:  
- 186 ppm  
- Date and time of sampling:  
- 4/3/2003 12:00  
- month/day/year time

#### 12. Temperature:  
- 79 °F  
- Date and time of measurement:  
- 4/3/2003 12:15  
- month/day/year time

### 13. Fill in the as-built section on the other side of this sheet.

### 14. Fill in attached surveyor's report.

### 15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

### 16. The proposed manufacturer's rated pump capacity is __________ gpm at a head of __________ ft.

### 17. Remarks:  
- No pump installed. Well for sampling

---

**Licensed Driller** (print) Mike Sobel  
C-57 Lic. No. 21358

**Signature**

**Date** 11/11/04

**Permittee** (print) COL Floyd A. Quintana, DPW, USAG-HI

**Signature**

**Date** 07/17/04

---

WCR1 Form 9/12/01 Page 1 of 4
13. AS-BUILT WELL SECTION  (Please attach as-built if different from diagram provided below)

Elevation at top of casing: 16 ft., msl*

Bench mark elevation: __ ft., msl* (Survey to nearest 0.01 ft.)

Total Depth: 46 ft.

Ground Elevation: __ ft., msl

Solid Casing: \( \geq 90\% \times (\text{Ground Elev.} - \text{Water Level Elev}) \)
- Length: 16 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.237 in.
- Bottom Elevation: 3.25 ft., msl

Open Casing: □ Perforated \( \times \) Screen
- Length: 30 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.337 in.
- Bottom Elevation: -26.75 ft., msl

Open Hole: Length: __________ ft.
- Diameter: __________ in.
- Bottom Elevation: __________ ft., msl

**msl = mean sea level

Solid Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
  □ And compliant with (check one or more): □ ASTM A242 \( \square \) Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one):
  □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 12
- Thermoset Plastic: (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
  □ And compliant with (check one or more): □ ASTM A242 \( \square \) Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one):
  □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 12
- Thermoset Plastic: (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.
### Drilling Log

**Geologic Log**

**Well No. 3113-03**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Fine sand (SM) Brown fill?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.2</td>
<td></td>
<td>First clearance, no detect OA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.4</td>
<td>Sand (SP) White, brown calcareous, well rounded, paleo-beach sand. Well sorted, coarse grained.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.6</td>
<td></td>
<td>Second clearance</td>
<td>Blow counts: 10</td>
<td>Sampled w/ 2&quot; sampler from 5.0' to 6.5'. Sand (SP)</td>
</tr>
<tr>
<td>-0.8</td>
<td></td>
<td>Third clearance/NT/OA</td>
<td>Blow counts: 12</td>
<td></td>
</tr>
<tr>
<td>-1.0</td>
<td></td>
<td>Fourth clearance/NT/OA</td>
<td>Blow counts: 7</td>
<td>Sampled w/ 2&quot; sampler from 10.0' to 11.5'. Sand (SP) w/ sorted, white, coarse grained</td>
</tr>
<tr>
<td>-1.2</td>
<td></td>
<td>Fifth clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1.4</td>
<td>Sand (SP) A/A, white to brown (cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Makua Military Reservation**

**Drilling agency:** Valley Drilling

**Name of Driller:** John Surtiad

**Manufacturer's designation of drill:** Mobile B-90

**Total No. of overburden samples taken:** Disturbed 2

**GPS Coord.** N 21 deg. 31.734' W 158 deg. 13.570'

**Total Depth of Hole:** 45 ft

**Elevation ground water:** 16.3'

**Datum for elevation shown:** MSL

**Vertical Hole No.:** ERDC MW-4A

**Date Started:** 9/20/02

**Completed:** 9/20/02

**Size and Type of Bit:** 7" 3 way

**Sampled w/ 2" sampler from 5.0' to 6.5'. Sand (SP) w/ sorted, white, coarse grained.**
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-16</td>
<td>SC: LL - 18-20 counts (only background)</td>
</tr>
<tr>
<td>-16</td>
<td>16.9' Water Table</td>
</tr>
<tr>
<td>-18</td>
<td>Sand (SP) A/A</td>
</tr>
<tr>
<td>-20</td>
<td>Sand (SP) White to brown, well-sorted, coarse grained, wet (auger cutting)</td>
</tr>
<tr>
<td>-22</td>
<td>Sand (SP) AA (cuttings)</td>
</tr>
<tr>
<td>-24</td>
<td>Sand (SP) AA (cuttings)</td>
</tr>
<tr>
<td>-26</td>
<td>Sand (SP) AA (cuttings)</td>
</tr>
<tr>
<td>-30</td>
<td>Sand (SP) AA (cuttings)</td>
</tr>
<tr>
<td>-32</td>
<td>Sand (SP) AA (cuttings)</td>
</tr>
<tr>
<td>-34</td>
<td>Sand (SP) AA (cuttings)</td>
</tr>
<tr>
<td>-36</td>
<td>Sand (SP) AA (cuttings)</td>
</tr>
</tbody>
</table>

Note: Drilling ahead to 20.0' - let hole set for 20 minutes to see if water comes back into hole. Measured 16.9' w electrical tape.

HNU - 0.9 ppm
SC: LL 18-20 counts (only background)
<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3.5</td>
<td>Fine brown sand</td>
<td>9/20/02</td>
</tr>
<tr>
<td>3.5 to 20</td>
<td>Sand, white with brown calcareous fragments, paleo beach sand.</td>
<td>9/20/02</td>
</tr>
<tr>
<td>20 to 45</td>
<td>Sand, white to brown, well-sorted</td>
<td>9/20/02</td>
</tr>
</tbody>
</table>

**Remarks:**

**For Official Use Only:**

04 DEC 2 P4:30
Monitoring Well Coordinates

Well MW-4A (3113-03)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 44”  Longitude (W) 158° 13’ 34”

Ground Elevation: 19.25 feet

Top of Casing Elevation: 22.23 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
Title: Monitoring Well Locations

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

DR BY: RSS 3-17-03
CHK BY: BJT 3-17-03

FIGURE NO:
2.16
WELL CONSTRUCTION PERMIT
ERDC-MW-4A, Well No. 3113-03

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-4A (Well No. 3113-03) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 11/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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 compliance with water rights.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature:_________________________ Date:_________________________

Printed Name: S/OLO Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature:_________________________ C-57 License #:_________________________ Date:_________________________

Printed Name:_________________________ Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment:

USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
State of Hawai'i
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
WELL COMPLETION REPORT - PART I
Well Construction

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

<table>
<thead>
<tr>
<th>1. State Well No.:</th>
<th>3113-04</th>
<th>2. Well Name:</th>
<th>ERDC-MW-4B</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Address:</td>
<td>Makua Military Reservation</td>
<td>4. Island:</td>
<td>Oahu</td>
</tr>
<tr>
<td>5. Drilling Company:</td>
<td>Valley Well Drilling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Drilling method used during construction:</td>
<td>Rotary ○ Percussion ○ Other (describe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Date Well Construction (drilled, cased, grouted) completed:</td>
<td>9/21/02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fill out attached Driller's Log
In addition to the driller's log, if a geologic log was prepared, please submit with this form.

8. Was the subject well cored? ○ Yes ○ No
9. Initial water-level encountered | 16.5 ft. below ground | Date and time of measurement: | 9/21/02 9:50 |
|                                  |                      | Details: |

10. Step-Drawdown Test completed? ○ No ○ Yes
11. Constant Rate Aquifer Test completed? ○ No ○ Yes

Parameters prior to pump test:
| 12. Water-level: | 4.02 ft. above msl | Date and time of measurement: | 4/15/03 9:30 |
| Chloride: | 168 ppm | Date and time of sampling: | 4/15/03 16:00 |
| Temperature: | 70 °F | Date and time of measurement: | 4/15/03 16:10 |

13. Fill in the as-built section on the other side of this sheet.
14. Fill in attached surveyor's report.
15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is _____ gpm at a head of _____ ft.
17. Remarks: No pump installed. Well for sampling

Licensed Driller (print) | Mike Saber | C-57 Lic. No. | 21358 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td></td>
<td>Date</td>
<td>11/16/04</td>
</tr>
</tbody>
</table>

Permittee (print) | COL Floyd A. Quintana, DPW, USAG-HI |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>10/30/04</td>
</tr>
</tbody>
</table>
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

- Elevation at top of casing: ______ ft., msl* (to nearest 0.01 ft.)
- Bench mark elevation: ______ ft., msl* (Survey to nearest 0.01 ft.)
- Minimum of 2' Radius & 4" Thick Concrete Pad
- Hole Diameter: _____ in.
- Ground Elevation: _____ ft., msl

**Solid Casing Material:**
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): X Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

**Open Casing Material:**
- Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139.
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one): □ Schedule 40 □ Schedule 80
- PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
- Thermoset Plastic: (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

*msl = mean sea level

---

Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.
**Well Number:** 3113-04  

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>Fine sand, brown</td>
<td>9/21/02</td>
</tr>
<tr>
<td>5 to 70</td>
<td>Sand, brown to white, well sorted</td>
<td>9/21/02</td>
</tr>
</tbody>
</table>

**Remarks:**

**For Official Use Only:**

RECEIVED
04 DEC 2  P4:30
### Geologic Log
**Well No. 3113-04**

#### Drilling Log

- **Makua Military Reservation**
- **Drilling agency**: Valley Drilling
- **Name of Driller**: John Surjadi
- **Manufacturer's designation of drill**: Mobile E-90
- **Total No. of overburden samples taken**: Disturbed 2
- **GPS Coord.**: N 21 deg 31.742' W 156 deg 57.3' (Acc. 19')

#### Vertical Hole No.
**ERDC MN-4B**
- **Size and Type of Bit**: 7" 3 way
- **Datum for elevation shown**: MSL
- **Date Started**: 9/20/02
- **Completed**: 9/20/02
- **Total Depth of Hole**: 70 ft
- **Elevation ground water**: 16.8'

#### Depth | Lithology | Description | Blow Counts | Comments
--- | --- | --- | --- | ---
0 | | First clearance. ND/DA. | | |
-2 | | End of fill. Sand (SP) brown to white. Very well sorted. Second clearance. ND/DA. | | |
-4 | | Sand (SP) cuttings. Third clearance. HNU - 0 ppm SC:LL - 18 - 20 counts | 15 | |
-6 | | Fourth clearance. ND/DA. Sand (SP) Brown to white (cuttings). | 30 | |
-8 | | Fifth clearance. HNU - 0 ppm SC:LL - 18 - 20 counts | 20 | |
-10 | | Sand (SP) A/A. Water table at 16.8' | 20 | |
-12 | | Note: Drilled hole to 20', let set 20 min to check water level. | | |
-14 | | | | |
-16 | | | | |
-18 | | | | |
-20 | | | | |
-22 | | | | |
-24 | | | | |
-26 | | | | |
-28 | | | | |
-30 | | | | |
Rock at 59 to 62', then back into sand

Note: Removed hard black material from sample.
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Depth Below Land Surface (ft.)

Elevation = 19.3 ft.

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Borehole Diameter (10" Minimum)

Bentonite Concrete Grout Backfill

Bentonite Pellet Seal (Minimum 2' Thick)

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)
Monitoring Well Coordinates
Well MW-4B (3113-04)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133

Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): $21^\circ\ 31'\ 44''$   Longitude (W) $158^\circ\ 13'\ 34''$

Ground Elevation: 19.27 feet
Top of Casing Elevation: 22.16 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT
ERDC-MW-4B, Well No. 3113-04

Note: This permit shall be prominently displayed at the site until the work is completed.

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 ERDC-MW-4B (Well No. 3113-04) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (123/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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 water rights.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: [Signature]
Printed Name: COL Floyd A. Quintana
Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: [Signature]
C-57 License #: A1358 Date: 11/16/84
Printed Name: Mike Sober
Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment:
USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
### WELL COMPLETION REPORT - PART I

**Well Construction**

**State of Hawaii**

**COMMISSION ON WATER RESOURCE MANAGEMENT**

**Department of Land and Natural Resources**

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 687-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

---

1. **State Well No.:** 3113-05  
   **Well Name:** ERDC-MW-4C  
   **Island:** Oahu

2. **Address:** Makua Military Reservation  
   **Tax Map Key:** 8-2-01:24

3. **Drilling Company:** Valley Well Drilling

4. **Drilling method used during construction:**  
   [ ] Rotary  
   [ ] Percussion  
   [ ] Other (describe)

5. **Date Well Construction (drilled, cased, grouted) completed:** 12/01/02

   Fill out attached Driller's Log

   In addition to the driller's log, if a geologic log was prepared, please submit with this form.

6. **Was the subject well cored?**  
   [ ] Yes  
   [x] No

7. **Initial water-level encountered:** 15 ft. below ground  
   **Date and time of measurement:** 12/03/02 16:30

8. **Step-Drawdown Test completed?**  
   [ ] No  
   [x] Yes

   Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

9. **Constant Rate Aquifer Test completed?**  
   [ ] No  
   [x] Yes

   Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

   **Parameters prior to pump test:**

10. **Water-level:** 4.05 ft. above msl  
    **Date and time of measurement:** 4/3/03 10:00

11. **Chloride:** 180 ppm  
    **Date and time of sampling:** 4/3/03 15:00

12. **Temperature:** 75°F  
    **Date and time of measurement:** 4/3/03 18:30

13. **Fill in the as-built section on the other side of this sheet.**

14. **Fill in attached surveyor's report.**

15. **If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)**

16. **The proposed manufacturer's rated pump capacity is ________ gpm at a head of ________ ft.**

17. **Remarks:** No pump installed, well for sampling

---

**Licensed Driller** (print)  
**Signature**

**Permittee** (print)  
**Signature**

---

C-57 Lic. No. 21358

Date 1/4/04

Date 1/4/04
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

Elevation at top of casing: ______ ft., msl*

Hole Diameter: ______ in.

Minimum of 2' Radius & 4' Thick Concrete Pad

Ground Elevation: ______ ft., msl

Bench mark elevation:

(Check nearest 0.01 ft.)

Cement Grout: 68 ft.
(min. 70% of distance from
ground elevation to top of
water surface or 500 ft.,
whichever is less.)

Annular space between
hole and casing (min.3):

____ in.

Rock or Gravel Packing:

32 ft.
Material:
X Crushed Basalt
□ Rounded Gravel

Water Level Elevation:

4.05 ft., msl*

Solid Casing: (≥ 90% x (Ground Elev.-Water Elev.))
Length: ______ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl

Open Casing: □ Perforated □ Screen
Length: ______ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl

Total Depth: 100 ft.

Open Hole:
Length: ______ ft.
Diameter: ______ in.
Bottom Elevation: ______ ft., msl

*msl = mean sea level

Solid Casing Material:
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one):
□ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
Thermoset Plastic: (check one)
□ Filament Wound Resin Pipe conforming to ASTM D2996
□ Centrifugally Cast Resin Pipe conforming to ASTM D2997
□ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ PTFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one):
□ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
Thermoset Plastic: (check one)
□ Filament Wound Resin Pipe conforming to ASTM D2996
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□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ PTFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

WCR1 Form 9/12/01 Page 1 of 4
<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 55</td>
<td>Sand, brown clayey, silty, sand, loose from cutting. Smooth drilling</td>
<td>12/03/02</td>
</tr>
<tr>
<td>55 to 66</td>
<td>Dark brown sandy, silty clay and basaltic rock</td>
<td>12/03/02</td>
</tr>
<tr>
<td>66 to 92</td>
<td>Dark brown sandy few, silty clay, few basaltic fine to coarse gravel</td>
<td>12/04/02</td>
</tr>
<tr>
<td>92 to 105</td>
<td>Dark brown sandy, silty, clay, few basaltic fine to coarse gravel</td>
<td>12/04/02</td>
</tr>
</tbody>
</table>

Remarks:

For Official Use Only:

04 DEC 2004
**Drilling Log**

**Makua Military Reservation**

**Drilling agency:** Valley Drilling

**Name of Driller:** John Surigad

**Manufacturer's designation of drill:** Mobile B-90

**Total No. of overburden samples taken:** Disturbed 0, Undisturbed 0

**Vertical Hole No.:** ERDC MW-4C

**Size and Type of Bit:** 10" Tri-cone, Mud rotary

**Datum for elevation shown:** MSL - 235.36'

**Date Started:** 12/04/02

**Completed:**

**Total Depth of Hole:** 105 ft

**Elevation ground water:** 15' bgs

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td></td>
<td>Approximate water table.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
<td>End UXO clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td></td>
<td>(SC) Brown, clayey, silty, sand w/ trace line to coarse basaltic gravel from drill cuttings.</td>
<td></td>
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<tr>
<td>-10</td>
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<tr>
<td>-46</td>
<td></td>
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</tr>
</tbody>
</table>

**Comments:**
- Drilling performed initially using 6" diameter hollow stem auger to facilitate UXO clearance. UXO clearance conducted every 3' down to 21' bgs.
- HNU and scintillator readings taken on drill cuttings at the same time as UXO clearances (every 3 feet).
- HUO - 5.0
- 36' bgs encountered cavities or void, slow drilling due to borehole instability and drilling mud loss.
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-50</td>
<td>Dark brown sandy, silty, clay, few basaltic fine to coarse gravel.</td>
</tr>
<tr>
<td>52-66</td>
<td>Basaltic rock layer, hard @ appx. 66' to 92' bgs.</td>
</tr>
<tr>
<td>105</td>
<td>Consolidated in 105' bgs. Bottom of well casing is at 105' bgs.</td>
</tr>
<tr>
<td>100</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>92-98</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>66-72</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>72-78</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>78-84</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>84-90</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>90-96</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>96-100</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>100-105</td>
<td>Basaltic rock.</td>
</tr>
<tr>
<td>105-110</td>
<td>Basaltic rock.</td>
</tr>
</tbody>
</table>
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Elevation = 19.7 ft.

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Borehole Diameter (10" Minimum)

Concrete

Bentonite

Grout Backfill

Bentonite Pellet Seal (Minimum 2' Thick)

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)

#3 Sand

Depth Below Land Surface (ft.)

5

10

15

20

25

30

35

40

45

50

55

60

65

70

75

80

85

90

95

100

Title: Well Construction Log ERDC-MW-4C

US Army Corps of Engineers

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

DR BY: RSS 01-30-04

CHK BY: SJT 01-30-04
Monitoring Well Coordinates

Well MW-4C (3113AQ 05)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 44”  Longitude (W) 158° 13’ 34”

Ground Elevation: 19.71 feet

Top of Casing Elevation: 22.67 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
Title: Monitoring Well Locations

US Army Corps of Engineers,
For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

FIGURE NO: 2.16
WELL CONSTRUCTION PERMIT
ERDC-MW-4C, Well No. 3113-05

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-4C (Well No. 3113-05) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/87) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1.4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: __/__/2004
Printed Name: Jim Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI
Driller's Signature: ___________________________ C-57 License #: 21356 Date: __/__/2004
Printed Name: Mike Sohn Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
C:

USGS
Department of Health & Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. State Well No.:</td>
<td><strong>3113-06</strong></td>
<td>Well Name:</td>
<td><strong>ERDC-MW-5</strong></td>
</tr>
<tr>
<td>2. Address:</td>
<td><strong>Makua Military Reservation</strong></td>
<td>Tax Map Key:</td>
<td><strong>8-2-01:20</strong></td>
</tr>
<tr>
<td>3. Drilling Company:</td>
<td><strong>Valley Well Drilling</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Drilling method used during construction:</td>
<td></td>
<td><strong>Rotary</strong></td>
<td></td>
</tr>
<tr>
<td>5. Date Well Construction (drilled, cased, grouted) completed:</td>
<td><strong>12/11/02</strong></td>
<td>Fill out attached Driller’s Log</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Was the subject well cored?</td>
<td></td>
<td><strong>Yes</strong></td>
<td></td>
</tr>
<tr>
<td>7. Initial water-level encountered</td>
<td><strong>235 ft.</strong></td>
<td>Date and time of measurement:</td>
<td><strong>12/09/2002 8:30</strong></td>
</tr>
<tr>
<td>8. Step-Drawdown Test completed?</td>
<td></td>
<td><strong>Yes</strong></td>
<td></td>
</tr>
<tr>
<td>9. Constant Rate Aquifer Test completed?</td>
<td></td>
<td><strong>Yes</strong></td>
<td></td>
</tr>
<tr>
<td>Parameters prior to pump test:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Water-level:</td>
<td><strong>15.35 ft.</strong></td>
<td>Date and time of measurement:</td>
<td><strong>4/3/2003 10:30</strong></td>
</tr>
<tr>
<td>11. Chloride:</td>
<td><strong>152 ppm</strong></td>
<td>Date and time of sampling:</td>
<td><strong>4/7/2003 13:30</strong></td>
</tr>
<tr>
<td>12. Temperature:</td>
<td><strong>75 °F</strong></td>
<td>Date and time of measurement:</td>
<td><strong>4/7/2003 14:00</strong></td>
</tr>
<tr>
<td>13. Fill in the as-built section on the other side of this sheet.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Fill in attached surveyor’s report.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. The proposed manufacturer’s rated pump capacity is <strong>1666 gpm</strong> at a head of <strong>170 ft.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remarks:</td>
<td><strong>No pump installed. Well for sampling</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Licensed Driller (print)**: Mike Soler

C-57 Lic. No.: 21253

**Signature**:

Date: 11/16/04

**Permittee (print)**: COL Floyd A. Quintana, DPW, USAG-HI

**Signature**:

Date: 12/07/04
**State of Hawaii**
**COMMISSION ON WATER RESOURCE MANAGEMENT**
**Department of Land and Natural Resources**

**DRILLER’S LOG**

Well Number: 3113-06

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0          to 25</td>
<td>Dark brown clayey silt to silty clay. Few basaltic rocks.</td>
<td>12/04/02</td>
</tr>
<tr>
<td>25         to 55</td>
<td>Basaltic rock layers mixed with dark brown clayey silt.</td>
<td>12/04/02</td>
</tr>
<tr>
<td>55         to 110</td>
<td>Dark brown clayey silt.</td>
<td>12/04/02</td>
</tr>
<tr>
<td>110        to 210</td>
<td>Brown clayey silt, void of boulders of basaltic rock pieces.</td>
<td>12/05/02</td>
</tr>
<tr>
<td>140        to 210</td>
<td>Light brown clayey silt</td>
<td>12/05/02</td>
</tr>
<tr>
<td>220        to 260</td>
<td>Fine grained silty sand. Very fine grained, poorly sorted.</td>
<td>12/05/02</td>
</tr>
<tr>
<td>260        to 303</td>
<td>Fine grained silty sand. Some clay lenses, very thin. Light brown</td>
<td>12/06/02</td>
</tr>
<tr>
<td>303        to 360</td>
<td>Clayey gravel. Loose gravel 2-5 cm in size. Well-rounded, poorly sorted</td>
<td>12/06/02</td>
</tr>
</tbody>
</table>

**Remarks:**

**For Official Use Only:**

RECEIVED

04 DEC 2 04:31

DL Form 06/24/2004
<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>-100</td>
<td>(ML) dk brown clayey silt, dry.</td>
<td></td>
<td></td>
<td>Air rotary drilling.</td>
</tr>
<tr>
<td>-90</td>
<td>(ML) dk brown clayey silt, dry.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-80</td>
<td>(ML) dk brown clayey silt, dry.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-70</td>
<td>Drilling smooth.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-60</td>
<td>Basaltic rock layers mixed with dk brown clayey silt (ML).</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-50</td>
<td>Basaltic rock layers mixed with dk brown clayey silt (ML).</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-40</td>
<td>Drilled through rock layers mixed with dk brown clayey silt (ML), dry.</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-30</td>
<td>Basaltic rock layers mixed with dk brown clayey silt (ML).</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td>(ML) dk brown clayey silt to silty clay, moist. Few basaltic rocks.</td>
<td></td>
<td>From drill cuttings HNU - 0 SC:LL - BG</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(ML) Brown clayey silt. Drilling smooth.


Same as above.

(SM) Fine grained silty sand. Very fine grained, poorly sorted.

(SM) Same as above.

(GM) Silty gravels. Gravel size 1-2 cm. Some silt matrix, approx. 25%. Poorly sorted.

(GM) Same as above.

(GC) Clayey gravel. Loose gravel 2-5 cm in size. Well-rounded, poorly sorted. Some clay matrix, 10-15%.

(GC) Same as above.
Monitoring Well Coordinates

Well MW-5 (3113-06)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on December 12, 2002

Latitude (N): 21° 31’ 42” Longitude (W) 158° 12’ 43”

Ground Elevation: 235.40 feet

Top of Casing Elevation: 235.22 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT
ERDC-MW-5, Well No. 3113-06

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-5 (Well No. 3113-06) at Makua Military Reservation, Oahu, TMK 8-2-01:20, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: October 28, 2002 Expiration Date: October 28, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ____________

Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAG-HI

Driller's Signature: ___________________________ Date: ____________

Printed Name: Mike Saber Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment:

C. USGS Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
   Honolulu Board of Water Supply
   State of Hawaii, Department of Land and Natural Resources
**State of Hawaii**

**COMMISSION ON WATER RESOURCE MANAGEMENT**

Department of Land and Natural Resources

**WELL COMPLETION REPORT - PART I**

**Well Construction**

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

<table>
<thead>
<tr>
<th>1. State Well No.</th>
<th>3213-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>ERDC-MW-2</td>
</tr>
<tr>
<td>Island</td>
<td>Oahu</td>
</tr>
<tr>
<td>Address</td>
<td>Makua Military Reservation</td>
</tr>
<tr>
<td>Tax Map Key</td>
<td>8-1-01:2</td>
</tr>
<tr>
<td>Drilling Company</td>
<td>Valley Well Drilling</td>
</tr>
<tr>
<td>Drilling method used during construction</td>
<td>Rotary</td>
</tr>
<tr>
<td>Date Well Construction completed</td>
<td>10/10/02</td>
</tr>
</tbody>
</table>

2. Was the subject well cored?  
   - Yes  
   - No

3. Initial water-level encountered | 11.7 ft. below ground |

4. Step-Drawdown Test completed?  
   - Yes  
   - No

5. Constant Rate Aquifer Test completed?  
   - Yes  
   - No

6. Water-level:  
   - 4.99 ft. above msl |

7. Chloride:  
   - 231 ppm |

8. Temperature:  
   - 80 °F |

9. Date and time of measurement:
   - 10/10/02 9:45

10. Date and time of measurement:
    - 10/11/02 10:15

11. Date and time of measurement:
    - 4/11/03 11:19

12. Date and time of measurement:
    - 9/11/03 11:19

13. Fill in the as-built section on the other side of this sheet.

14. Fill in attached surveyor's report.

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is ______ gpm at a head of ______ ft.

17. Remarks:  
   - No pump installed, well is for sampling only.

---

**Licensed Driller (print)**  
Mike Sober  
C-57 Lic. No. 21358

---

**Permittee (print)**  
COL Floyd A. Quintana, DPW, USAG-HI

---

License Date  
11/16/04

License Date  
9/20/04
13. AS-BUILT WELL SECTION

(Please attach as-built if different from diagram provided below)

Bench mark elevation:

____ ft., msl*
(Survey to nearest 0.01 ft.)

Elevation at top of casing (to nearest 0.01 ft.)

Hole Diameter: __ in.

Minimum of 2' Radius & 4" Thick Concrete Pad

Ground Elevation: __ ft., msl

Total Depth __ ft.

Solid Casing: (≥ 90% x (Ground Elev.-Water Level Elev))

Length: __ ft.
Nominal Diameter: __ in.
Wall Thickness: __ in.
Bottom Elevation: __ ft., msl

Open Casing: ☑ Perforated ☐ Screen

Length: __ ft.
Nominal Diameter: __ in.
Wall Thickness: __ in.
Bottom Elevation: __ ft., msl

Open Hole: ☐ Filled with gravel

Length: __ ft.
Diameter: __ in.
Bottom Elevation: __ ft., msl

*msl = mean sea level

Solid Casing Material:

Carbon Steel: compliant with (check one or more): ☐ ANSI/AWWA C200 ☐ API Spec. 5L ☐ ASTM A53 ☐ ASTM A139

And compliant with (check one or more): ☐ ASTM A242 ☐ Type E ☐ Type S ☐ Grade B ☐ Other

Stainless Steel: (check one):

☐ ASTM A409 (production wells) ☐ ASTM A312 (monitor wells)

ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) ☐ Schedule 40 ☐ Schedule 80

PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) ☐ Schedule 40 ☐ Schedule 80 ☐ Schedule 12

Thermoset Plastic: (check one)

☐ Filament Wound Resin Pipe conforming to ASTM D2996
☐ Centrifugally Cast Resin Pipe conforming to ASTM D2997
☐ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
☐ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
☐ PTFE Fluorocarbon Tubing conforming to ASTM D3296
☐ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

Carbon Steel: compliant with (check one or more): ☐ ANSI/AWWA C200 ☐ API Spec. 5L ☐ ASTM A53 ☐ ASTM A139

And compliant with (check one or more): ☐ ASTM A242 ☐ Type E ☐ Type S ☐ Grade B ☐ Other

Stainless Steel: (check one):

☐ ASTM A409 (production wells) ☐ ASTM A312 (monitor wells)

ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) ☐ Schedule 40 ☐ Schedule 80

PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) ☐ Schedule 40 ☐ Schedule 80 ☐ Schedule 12

Thermoset Plastic: (check one)

☐ Filament Wound Resin Pipe conforming to ASTM D2996
☐ Centrifugally Cast Resin Pipe conforming to ASTM D2997
☐ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
☐ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
☐ PTFE Fluorocarbon Tubing conforming to ASTM D3296
☐ FEP Fluorocarbon Tubing conforming to ASTM D3296

Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.

Hole Diameter: __ in.

Minimum of 2' Radius & 4" Thick Concrete Pad

Ground Elevation: __ ft., msl

Total Depth __ ft.

Solid Casing: (≥ 90% x (Ground Elev.-Water Level Elev))

Length: __ ft.
Nominal Diameter: __ in.
Wall Thickness: __ in.
Bottom Elevation: __ ft., msl

Open Casing: ☑ Perforated ☐ Screen

Length: __ ft.
Nominal Diameter: __ in.
Wall Thickness: __ in.
Bottom Elevation: __ ft., msl
State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources  
DRILLER'S LOG

Well Number: 3213-08

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1.5</td>
<td>Silty sand, with basalt fragments</td>
<td>10/09/02</td>
</tr>
<tr>
<td>1.5 to 25</td>
<td>Clay, black, slight sand, basalt frags</td>
<td>10/09/02</td>
</tr>
<tr>
<td>25 to 30.5</td>
<td>Clay, slightly sandy, basalt frags</td>
<td>10/09/02</td>
</tr>
<tr>
<td>30.5 to 35</td>
<td>Lean clay, some sand.</td>
<td>10/09/02</td>
</tr>
</tbody>
</table>

Remarks:

DL Form 06/24/2004
Drilling Log
Well No. 3213-08

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Silty sand (SM), black, slightly sandy</td>
<td>0 ppm</td>
<td>Background counts 18-20 ppm</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>Clay (CL) Black, sl. sandy, basalt frags.</td>
<td>18-20 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td>First clearance. No detect - drilling ahead.</td>
<td>18-20 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-3</td>
<td>Lean clay (CL) dark gray w/ silt</td>
<td>HNU - 0 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>Lean clay (CL) dark gray w/sand/silts. Inclusions and lenses.</td>
<td>SC:LL - 18-20 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td>Fourth clearance. No detect - drilling ahead.</td>
<td>HNU - 0 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-9</td>
<td>Third clearance. No detect - drilling ahead.</td>
<td>SC:LL - 18-20 counts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>11.7' (Approx. water table)</td>
<td>HNU - 0 ppm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GPS Coord., N 21 deg. 32.893' W 158 deg. 13.13.694' MSL

Datum for elevation shown: MSL

Vertical Hole No. ERDC MW-2

Elevation ground water: 11.7 ft

Total Depth of Hole: 35 ft

- Disturbed 3
- Undisturbed

Makua Military Reservation

Drilling agency: Valley Drilling

Name of Driller: John Surfaced

Manufacturer's designation of drill: Mobile B-90

Total No. of overburden samples taken: Disturbed

Date Started: 10/09/02

Completed: 10/09/02

Vertical Hole No. ERDC MW-2

Name of Driller: John Surfaced

Manufacturer's designation of drill: Mobile B-90

Total No. of overburden samples taken: Disturbed

Date Started: 10/09/02

Completed: 10/09/02
| -16 | Sixth clearance. No detect - drilling ahead. |
| -17 |  |
| -18 | Seventh clearance (final). No detect - drilling ahead. |
| -19 |  |
| -20 |  |
| -21 | Lean clay, slightly sandy. Dark gray, trace basalt frags. (auger cuttings). |
| -22 |  |
| -23 |  |
| -24 |  |
| -25 | Rock and rock frags (recovered basalt frags). |
| -26 |  |
| -27 |  |
| -28 |  |
| -29 |  |
| -30 | Lean clay (CL A)A more sandy (auger cuttings) |
| -31 |  |
| -32 |  |
| -33 |  |
| -34 |  |
| -35 |  |

|  | HNU - 0 ppm SC LL - 18-20 counts |
|  | HNU - 0 ppm SC LL - 18-20 counts |
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Bentonite Pellet Seal (Minimum 2' Thick)

Bentonite Concrete Grout Backfill

Borehole Diameter (10" Minimum)

#3 Sand

4" Diameter PVC Schedule 40 Riser Pipe

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)
Monitoring Well Coordinates

Well MW-2 (3213-08)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): $21^{\circ}32'04''$  Longitude (W) $158^{\circ}13'42''$

Ground Elevation: 10.81 feet

Top of Casing Elevation: 13.59 feet

Coordinates are referred to the North American Datum of 1983 (NAD83) / Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT
ERDC-MW-2, Well No. 3213-08

Note: This permit shall be prominently displayed at the site until the work is completed

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 Surface Diversion Works", this document permits the construction and testing of ERDC-MW-2 (Well No. 3213-08) at Makua Military Reservation, Cahu, TMK 8-1-01-2, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1 1/2-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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 consumptive water rights.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: 10/07/04

Printed Name: COL Floyd A. Quintana Firm or Title: Director of Public Works, USAC-HI

Driller's Signature: ___________________________ C-57 License #: 21358 Date: 11/16/04

Printed Name: Mike Sober Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
C: USGS
   Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
   Honolulu Board of Water Supply
State of Hawaii  
COMMISSION ON WATER RESOURCE MANAGEMENT  
Department of Land and Natural Resources  
WELL COMPLETION REPORT - PART I  
Well Construction

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

1. **State Well No.:** 3213-09  
**Well Name:** ERDC-MW-3A  
**Island:** Oahu

2. **Address:** Makua Military Reservation  
**Tax Map Key:** 8-1-01-3

3. **Drilling Company:** Valley Well Drilling

4. **Drilling method used during construction:**  
   - [ ] Rotary  
   - [ ] Percussion  
   - [ ] Other (describe)

5. **Date Well Construction (drilled, cased, grouted) completed:** 10/15/2002  
   - Fill out attached Driller's Log

   In addition to the driller's log, if a geologic log was prepared, please submit with this form.

6. **Was the subject well cored?**  
   - [ ] Yes  
   - [ ] No

7. **Initial water-level encountered:** 17 ft. below ground  
**Date and time of measurement:** 10/14/2002 10:00

8. **Step-Drawdown Test completed?**  
   - [ ] Yes  
   - [ ] No  
   - Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

9. **Constant Rate Aquifer Test completed?**  
   - [ ] Yes  
   - [ ] No  
   - Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:

10. **Water-level:** 3.81 ft. above msl  
    **Date and time of measurement:** 4/1/2003 11:00

11. **Chloride:** 55 ppm  
    **Date and time of sampling:** 4/1/2003 11:30

12. **Temperature:** 59 °F  
    **Date and time of measurement:** 4/1/2003 11:30

13. Fill in the as-built section on the other side of this sheet.

14. Fill in attached surveyor's report.

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is _______ gpm at a head of _______ ft.

17. **Remarks:** No pump installed. Well is for sampling

---

**Licensed Driller (print):** Mike Sobor  
**C-57 Lic. No.:** 21358

**Signature:**  
**Date:** 11/16/04

**Permittee (print):** COL Floyd A. Quintana, DPW, USAG-HI

**Signature:**  
**Date:** 12/1/04
13. AS-BUILT WELL SECTION

(please attach as-built if different from diagram provided below)

**Solid Casing Material:**

- **Carbon Steel:** compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
  And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- **Stainless Steel:** (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- **ABS Plastic** conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- **PVC Plastic** conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) □ Schedule 40 □ Schedule 80 □ Schedule 80 □ Schedule 12
- **Thermoset Plastic:** (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296

**Open Casing Material:**

- **Carbon Steel:** compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
  And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- **Stainless Steel:** (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- **ABS Plastic** conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
- **PVC Plastic** conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) □ Schedule 40 □ Schedule 80 □ Schedule 80 □ Schedule 12
- **Thermoset Plastic:** (check one)
  □ Filament Wound Resin Pipe conforming to ASTM D2996
  □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  □ FEP Fluorocarbon Tubing conforming to ASTM D3296
Well Number: 3213-09

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20</td>
<td>Dark brown sandy clayey silt few basaltic fragments</td>
<td>10/14/2002</td>
</tr>
<tr>
<td>20 to 45</td>
<td>Brown clayey silty sand, trace basaltic fine pebbles</td>
<td>10/14/2002</td>
</tr>
</tbody>
</table>

Remarks:
## Geologic Log
### Well No. 3213-09

<table>
<thead>
<tr>
<th>Drilling Log</th>
<th>DRAFT</th>
<th>Vertical Hole No.</th>
<th>ERDC MW-3A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makua Military Reservation</td>
<td>Size and Type of Bit: 10'-dia Hollow Stem Auger</td>
<td>Datum for elevation shown: MSL (approx. 20')</td>
<td></td>
</tr>
<tr>
<td>Drilling agency: Valley Drilling</td>
<td>Date Started: 10/14/02</td>
<td>Completed: 10/14/02</td>
<td></td>
</tr>
<tr>
<td>Name of Driller: John Suriaad</td>
<td>Total No. of overburden samples taken: Disturbed 3</td>
<td>Total Depth of Hole: 45 ft</td>
<td></td>
</tr>
<tr>
<td>Manufacturer's designation of drill: Mobile B-90</td>
<td>Undisturbed Elevation ground water: 17' bgs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ML Dark brown sandy clayey silt with few basaltic gravel fragments (dry) (loose) (tilt)</td>
<td>HNU - 0 ppm SC: LL - 17-26 background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2</td>
<td>ML Dark brown sandy clayey silt, few basaltic gravel fragments (dry) (loose)</td>
<td>UXO clearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>#1 Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-6.0'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4.25</td>
<td>21 27 25% recovery HNU - 0 ppm SC: LL - 20-30, background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>#2 Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Sample ID: MMRSSMW-3A-10.0' Sampler refusal&lt;1' 3rd UXO clearance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td>30 60 33% recovery 2nd UXO clearance at 6' bgs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>#3 Sample w/ 2&quot; dia split spoon sampler, 140 lb. hammer. Rock in sample shoe. low recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td>20 20 4th UXO clearance. HNU - 0 ppm SC: LL 20-35, background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td>ML Dark brown clayey sandy silt, trace basaltic gravel, fine gravel (moist) (medium dense to dense)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*SC:LL - 20 ppm background UXO clearance*
Approx. depth to water table: 17 ft bgs

SC-SM Brown clayey silty sand, trace basaltic fine pebbles (wet) (soft)

HNU - 0 ppm
SC-LL - 17-30, background.

5th UXO clearance 18 ' bgs
End UXO clearance

From drill cutting
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Borehole Diameter (10" Minimum)

Water Level

Bentonite Concrete Grout Backfill

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)
Monitoring Well Coordinates

Well MW-3A (3213-09)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki (Surveyor's Lic. #10059)

Surveyed on June 30, 2003

Latitude (N): 21° 31' 52"
Longitude (W): 158° 13' 36"

Ground Elevation: 19.11 feet
Top of Casing Elevation: 22.02 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State Survey Monument 8-10 having an elevation of 17.83 feet.
WELL CONSTRUCTION PERMIT

ERDC-MW-3A, Well No. 3213-09

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-3A (Well No. 3213-09) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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 cumulative water rights.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msL) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

GILBERT S. COLOMA-AGARAN, Chairperson
Commission on Water Resource Management

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ______________________ Date: ______________________
Printed Name: SOL Floyd A. Quintana Firm or Title: Director of Public Works, USAC-HI

Driller's Signature: ______________________ Date: ______________________
Printed Name: Mike Sabur Firm or Title: Valley Well Drilling

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
c: USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT - PART I
Well Construction

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0225. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

1. State Well No.: 3213-10 Well Name: ERDC-MW-38 Island: Oahu
2. Address: Makua Military Reservation Tax Map Key: 8-1-01:1
3. Drilling Company: Valley Well Drilling
4. Drilling method used during construction: ☑ Rotary ☐ Percussion ☐ Other (describe)
5. Date Well Construction (drilled,cased,grouted) completed: 10/14/02 Fill out attached Driller's Log
6. Was the subject well cored? ☑ Yes ☐ No
7. Initial water-level encountered 15 ft. below ground Date and time of measurement: 4/3/2003 9:20
8. Step-Drawdown Test completed? ☑ Yes ☐ No Attach Step-Drawdown Test form (12/17/97 SDPTD Form)
9. Constant Rate Aquifer Test completed? ☑ Yes ☐ No Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)
12. Temperature: 75 °F Date and time of measurement: 4/3/2003 14:20
13. Fill in the as-built section on the other side of this sheet.
14. Fill in attached surveyor's report.
15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)
16. The proposed manufacturer's rated pump capacity is _____ gpm at a head of _____ ft.
17. Remarks: No pump installed, well for sampling

Licensed Driller (print) Mike Soren C-57 Lic. No. 21358
Signature Date 11/6/04

Permittee (print) COL Floyd A. Quintana, DPW, USAG-HT
Signature Date 11/6/04
13. AS-BUILT WELL SECTION (Please attach as-built if different from diagram provided below)

Bench mark elevation: ______________ ft., msl* (Survey to nearest 0.01 ft.)

Elevation at top of casing ______________ ft., msl*

Minimum of 2' Radius & 4" Thick Concrete Pad

Hole Diameter: 10 in.

Ground Elevation: ______________ ft., msl

Cement Grout: 42 ft. (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

Annular space between hole and casing (min. 3"):

Rock or Gravel Packing:

Material:

- Crushed Basalt
- Rounded Gravel

Water Level Elevation: 3.78 ft., msl*

Total Depth 70 ft.

Solid Casing Material:

Carbon Steel: compliant with (check one or more):
- ANSI/AWWA C200
- API Spec. 5L
- ASTM A53
- ASTM A139
  And compliant with (check one or more):
- ASTM A242
- Type E
- Type S
- Grade B
- Other

Stainless Steel: (check one):
- ASTM A409 (production wells)
- ASTM A312 (monitor wells)

ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one)
- Schedule 40
- Schedule 80

PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one)
- Schedule 40
- Schedule 80
- Schedule 12

Thermoset Plastic: (check one)
- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrifugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

Carbon Steel: compliant with (check one or more):
- ANSI/AWWA C200
- API Spec. 5L
- ASTM A53
- ASTM A139
  And compliant with (check one or more):
- ASTM A242
- Type E
- Type S
- Grade B
- Other

Stainless Steel: (check one):
- ASTM A409 (production wells)
- ASTM A312 (monitor wells)

ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one)
- Schedule 40
- Schedule 80

PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one)
- Schedule 40
- Schedule 80
- Schedule 12

Thermoset Plastic: (check one)
- Filament Wound Resin Pipe conforming to ASTM D2996
- Centrifugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Hole: Filled with gravel pack

Length: a ______________ ft.
Diameter: 10 ______________ in.
Bottom Elevation: -57.66 ______________ ft., msl

Solid Casing: (≥ 90% x (Ground Elev.-Water Level Elev.)

Length: 42 ______________ ft.
Nominal Diameter: 4 ______________ in.
Wall Thickness: 0.237 ______________ in.
Bottom Elevation: -23.66 ______________ ft., msl

Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.

Please attach as-built if different from diagram provided below.
Well Number: 3213-10

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 16</td>
<td>Dark brown sandy clayey silt</td>
<td>10/16/02</td>
</tr>
<tr>
<td>16 to 60</td>
<td>Brown clayey silty sand</td>
<td>10/16/02</td>
</tr>
<tr>
<td>60 to 62</td>
<td>Black silty sandy clay with trace basaltic pebbles</td>
<td>10/16/02</td>
</tr>
<tr>
<td>62 to 70</td>
<td>Basaltic boulders. Slow drilling</td>
<td>10/18/02</td>
</tr>
</tbody>
</table>

Remarks:

DL Form 06/24/2004
**Drilling Log**  
**Well 3213-10**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Lithology</th>
<th>Description</th>
<th>Blow Counts</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>ML</td>
<td>Dark brown sandy clayey silt, few basaltic fine gravel (dry) (loose) (fill)</td>
<td>26</td>
<td>UXO clearance</td>
</tr>
<tr>
<td>-4</td>
<td>ML</td>
<td>Drilling smooth</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>ML</td>
<td>Dark brown sandy clayey silt, few basaltic fine gravel (dry) (medium) (dense)</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td>ML</td>
<td>Drilling smooth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>ML</td>
<td>Dark brown sandy clayey silt, few basaltic fine gravel fragments (dry) (medium dense to dense)</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td>ML</td>
<td>Drilling smooth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td>ML-SC</td>
<td>Dark brown sandy clayey silt, clayey sand at about 16' bgs, few basaltic gravel and cobble (wet) (medium dense)</td>
<td>75%</td>
<td>End UXO clearance</td>
</tr>
<tr>
<td>-16</td>
<td></td>
<td>Approx. water table at 16' bgs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-18</td>
<td></td>
<td>Drilling smooth</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drilling Log**  
**Makua Military Reservation**  
**DRAFT**

**Drilling agency:** Valley Drilling  
**Name of Driller:** John Suriaad  
**Manufacturer's designation of drill:** Mobile B-90

**Total No. of overburden samples taken:** Disturbed 3  
**Undisturbed**

**Depth** | **Lithology** | **Description** | **Blow Counts** | **Comments**
---|---|---|---|---
0 | ML | Dark brown sandy clayey silt, few basaltic fine gravel (dry) (loose) (fill) | | |
-2 | ML | Drilling smooth | | UXO clearance |
-4 | ML | | 26 | |
-6 | ML | | 30 | |
-8 | ML | | 20% | |
-10 | ML | | | |
-12 | ML | | | |
-14 | ML-SC | | | |
-16 | | Approx. water table at 16' bgs | | |
-18 | | Drilling smooth | | |
-20 | | | | |
-22 | | | | |

**Vertical Hole No.:** ERDC MW-3B

**Size and Type of Bit:**

**Datum for elevation shown:** MSL (appx. 20')

**Date Started:** 10/16/02  
**Completed:**

**Total Depth of Hole:** 70 ft

**Elevation ground water:** 4' (16' bgs)

**Blow Counts**

- 26
- 30
- 20%
- 80%
- 75%

**Comments**

- UXO clearance
- Sample w/ 2 in diameter split spoon sampler, 140 lb hammer
- Sample ID: MMRSSMW-3B-5.0
- HNU - 0
- SC:LL - 20 to 30, BG
- UXO clearance
- Sample w/ 2 in diameter split spoon sampler, 140 lb hammer
- Sample ID: MMRSSMW-3B-10.0`
- HNU - 0
- SC:LL - 15 to 35, BG
- UXO clearance
- Sample w/ 2 in diameter split spoon sampler, 140 lb hammer
- Sample ID: MMRSSMW-3B-15.0`
- HNU - 0, SC:LL - 15 to 33 BG, UXO clearance
- End UXO clearance
- HNU - 0 End HNU monitoring
<table>
<thead>
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<th>Depth</th>
<th>Description</th>
<th>From</th>
</tr>
</thead>
<tbody>
<tr>
<td>-24</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-26</td>
<td>Drilling smooth</td>
<td></td>
</tr>
<tr>
<td>-28</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-32</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-34</td>
<td></td>
<td></td>
</tr>
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<td>-36</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-40</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
</tr>
<tr>
<td>-42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-44</td>
<td>Drilling smooth</td>
<td></td>
</tr>
<tr>
<td>-46</td>
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<tr>
<td>-48</td>
<td></td>
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</tr>
<tr>
<td>-50</td>
<td>SC Brown clayey silty sand</td>
<td>From drill cuttings</td>
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<tr>
<td>-52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Drilling smooth

-56

SC Brown clayey silty sand

-58

CL Black silty sandy clay with trace basaltic pebbles (wet) (soft)

-60


-62

Drilling hard, lots of drill bit chatter. Basaltic rock stratum.

-64

Drilling hard to TD of borehole.

-66

Approx. depth from drill cuttings

-68

TD 63' bgs with 10" auger

-70

Charcoal odor, black silty clay with basalt rock fragments
Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

Elevation = 18.3 ft.

Depth Below Land Surface (ft.)

Steel, cement filled pickets (1 of 3)

Concrete Surface Seal

4" Diameter PVC Schedule 40 Riser Pipe

Water Level

Bentonite Concrete Grout Backfill

Borehole Diameter (10" Minimum)

Bentonite Pellet Seal (Minimum 2' Thick)

#3 Sand

4" Diameter PVC Schedule 40 Slotted Screen (0.020" Slot Size)
Monitoring Well Coordinates

Well MW-3B (3213-10)

Survey by R.M. Towill, Inc.
420 Waiakamilo Rd
Honolulu, HI 96817
Tel: 842-1133
Mr. Ryan Suzuki

Surveyed on June 30, 2003

Latitude (N): 21° 31’ 52”   Longitude (W) 158° 13’ 36”

Ground Elevation: 18.34 feet

Top of Casing Elevation: 21.25 feet

Coordinates are referred to the North American Datum of 1983 (NAD83)
Elevations are referred to Mean Sea Level (M.S.L.) being established from State
Survey Monument 8-10 having an elevation of 17.83 feet.
Title: Monitoring Well Locations

US Army Corps of Engineers.

For: U.S. Army Garrison Hawaii
Proj: Makua Military Reservation

DR BY: RBS 3-17-03
CHK BY: SJT 3-17-03

FIGURE NO: 2.16

Ref: USGS Kona T. Quadrangle
WELL CONSTRUCTION PERMIT
ERDC-MW-3B, Well No. 3213-10

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-3B (Well No. 3213-10) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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 §13-168-16, Hawaii Administrative Rules.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department’s Historic Preservation immediately.

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

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

GILBERT S. COLOMA-AGARAN, 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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee’s Signature: ____________________________ Date: ______________________
Printed Name: ____________________________ Firm or Title: ____________________________
Driller’s Signature: ____________________________ Date: ______________________
Printed Name: ____________________________ Firm or Title: ____________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health’s Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
WELL COMPLETION REPORT - PART I
Well Construction

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at 587-0226. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

1. State Well No.: 3213-11  
   Well Name: ERDC-MW-3C  
   Island: Oahu

2. Address: Makua Military Reservation  
   Tax Map Key: 8-1-01:1

3. Drilling Company: Valley Well Drilling

4. Drilling method used during construction:  X Rotary  □ Percussion  □ Other (describe)

5. Date Well Construction (drilled,cased,grouted) completed: 4/23/02  
   Fill out attached Driller's Log

   In addition to the driller's log, if a geologic log was prepared, please submit with this form.

6. Was the subject well cored?  □ Yes  X No

7. Initial water-level encountered  16 ft. below ground  
   Date and time of measurement: 4/26/02 13:00

8. Step-Drawdown Test completed?  □ No  X Yes  
   Attach Step-Drawdown Test form (12/17/97 SDPTD Form)

9. Constant Rate Aquifer Test completed?  □ No  X Yes  
   Attach Constant Rate Aquifer Test form (12/17/97 CRPTD Form)

Parameters prior to pump test:

10. Water-level: 3.82 ft. above msl  
    Date and time of measurement: 4/2/2002 15:00

11. Chloride: 57 ppm  
    Date and time of measurement: 4/1/2002 15:30

12. Temperature:  75°F  
    Date and time of measurement: 4/1/2002 15:45

13. Fill in the as-built section on the other side of this sheet.

14. Fill in attached surveyor's report.

15. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)

16. The proposed manufacturer's rated pump capacity is ______ gpm at a head of ______ ft.

17. Remarks: No pump installed. Well for sampling

Licensed Driller (print)  Mike Sibora  
C-57 Lic. No. 21358

Signature  [Signature]  Date  11/16/02

Permittee (print)  COL Floyd A. Quintana, DPW, USAG-HI

Signature  [Signature]  Date  12/8/02
### DRILLER'S LOG

**Well Number:** 3213-11

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock description, Water level, etc.</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 26</td>
<td>Dark brown clayed silt, Some fragments of basalt</td>
<td>11/20/2002</td>
</tr>
<tr>
<td>26 to 45</td>
<td>Basaltic rock boulder layer</td>
<td>11/21/2002</td>
</tr>
<tr>
<td>45 to 60</td>
<td>Black silty clay with trace of basalt fragments</td>
<td></td>
</tr>
<tr>
<td>60 to 85</td>
<td>Basaltic rock layer, boulders</td>
<td></td>
</tr>
<tr>
<td>85 to 106</td>
<td>Black silty clay, soft, trace basaltic fragments</td>
<td></td>
</tr>
</tbody>
</table>

### Remarks:

**For Official Use Only:**

04 DEC 2  P4:29

**DL Form 06/24/2004**
**Drilling Log**  
**Makua Military Reservation**

**Drilling agency:** Valley Drilling  
**Name of Driller:** John Surigaad  
**Manufacturer's designation of drill:** Mobile B-90

<table>
<thead>
<tr>
<th>Total No. of overburden samples taken</th>
<th>Disturbed 2</th>
<th>Undisturbed</th>
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<tr>
<td><strong>Elevation ground water:</strong></td>
<td>15.5' bgs</td>
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<tr>
<td><strong>Datum for elevation shown:</strong></td>
<td>MSL</td>
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<table>
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<td>SPT 4/1/16</td>
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<td>-24</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-26</td>
<td>Basaltic rock layer at appx. 26' bgs to appx. 45' bgs</td>
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<td>-44</td>
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<td></td>
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<tr>
<td>-46</td>
<td>(CL) Black silty clay with trace of basaltic rock fragments</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Depth of Hole:** 106 ft

**Date Started:** 11/20/02

**Completed:** 11/27/02

**Vertical Hole No.:** ERDC MW-3C

**Size and Type of Bit:** 10" tri-cone

Drilling performed using 6" diameter hollow stem auger to facilitate UXO clearance. UXO clearance conducted every 3' down to 21' bgs. HNU scintillator readings taken on drill cuttings at the same time as UXO clearance. HNU - B SC-LL - 15 to 15 (background) levels.

End of UXO clearance.

Appx. water table.
MEMORANDUM FOR THE RECORD

FROM: Lenore Nakama
SUBJECT: Well Completion Reports for 3113-02 to 06 & 3213-08 to 11

8/11/04 called Traci Sober of Valley Well Drilling to check on the status of the well construction permits for the subject Army wells. She said they needed an extension. I asked Traci who she was communicating with at the Army, because to extend the permits, I need a brief explanation of why the wells couldn't be completed in the 1st two years. She gave me a name of the person in the field, Steve Turnbull (cell phone 295-4998).

8/12/04 called Steve Turnbull. He said the wells were actually completed, but they weren't sure if they were permanent because they might be sealed instead. He said he was waiting to file the Completion Reports until it was determined if the wells would be kept or not. I informed Steve that he should file the WCR 1 because the wells were completed under the permit. If the wells are to be sealed later, well abandonment permits should be obtained first. He said he had misunderstood and that he will work on getting the WCR 1s in for all 9 wells. He said it will take about a month before he will be able to get the military commander's signature. I told him that he could send in partially executed WCR 1s and let us know that fully executed WCR 1s would be forthcoming. He said that he would prefer to wait until he can get the signatures. I told him that would be fine.

10-8-04 Left msg for Steve to call me re: status of WCR 1
10-8-04 Steve called back, will submit for signature ASAP. Told him we could wait another 3 weeks or so before notice of violation send.
November 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-5 (Well No. 3113-06)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for your permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures

c: State of Hawaii, Department of Land and Natural Resources
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 ERDC-MW-5 (Well No. 3113-06) at Makua Military Reservation, Oahu, TMK 8-2-01:20, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 by issued by the Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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 cumulative water rights.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence the water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit to the chairperson, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: October 28, 2002
Expiration Date: October 28, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ______________
Printed Name: ___________________________ Firm or Title: ___________________________

Driller's Signature: ___________________________ C-57 License #: ___________________________ Date: ______________
Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health, Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Supply
State of Hawaii, Department of Land and Natural Resources
Well No. 3113-06
Well Name erdc-mw-5
Applicant u.s. army

SECTION 1: WELL LOCATION INFORMATION

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIAAANAE</td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>######</td>
</tr>
</tbody>
</table>

SECTION 2: WELL SECTION DATA (enter data in grey cells only)

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>1025 ft.</th>
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</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>ft., m.s.l.</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>ft.</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>ft.</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>in.</td>
</tr>
<tr>
<td>Total Depth</td>
<td>ft.</td>
</tr>
<tr>
<td>Estimated Head</td>
<td>ft., m.s.l.</td>
</tr>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>256.3 ft.</td>
</tr>
<tr>
<td>County Water Supply (Y/N ?)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solid Casing</th>
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SECTION 3: CHECKLIST (values to check are shaded)

Well Depth
Theoretical Thickness of Aquifer | 1025 ft. |
1/4 Aquifer Thickness | 256.3 ft. |
Depth of Well below Sea Level | 25 ft. | okay | (refer to HWCPIS Section 2.2)

Well Casing
Minimum Wall Thickness
Material | PVC |
County or Non-County | non-county |
Minimum Thickness per standards | 0.237 in. |
Well Thickness Provided | 0.406 in. | okay | (refer to HWCPIS Section 2.4 c)
Minimum Length of Solid Casing
90% of ground to top of aquifer | 157.5 ft. |
Length of solid casing Provided | 170 ft. | okay | (refer to HWCPIS Section 2.4 d)
Casing Material | Sch 40 |
Annular Space
If the cell above reads #N/A, reference HWCPIS)

Depth of Grouting
Calculated Depth of Grouting | 122.5 ft. |
Depth of Grouting provided | 165 ft. | okay | (refer to HWCPIS Section 2.6 c)
Thickness of Annular Space | 3 in. | okay | (refer to HWCPIS Section 2.6 d)
MEMORANDUM

TO: Linnel T. Nishioka, Deputy Director  
Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator  

SUBJECT: Application for Permit – Well Construction; State Well No. 3113-06, Well Name ERDC-MW-5, Makua, Waianae, Oahu, Tax Map Key: 8-2-001:Por 20

October 25, 2002

This is a follow-up to your memorandum dated July 26, 2002, requesting for confirmation of State ownership; obtain the Chairperson's signature on the attached Application for Permit and confirmation if Chapter 343 have been met.

Please find enclosed the permit with the Chairperson's signature.

In regards to the confirmation on whether Chapter 343 have been met, please refer to the Department of Army's letter dated October 21, 2002, stating that they are not required to obtain a CDUA permit under the doctrine of sovereign immunity.

Should you have any questions, please feel free to call Patti Miyashiro of my staff at 587-0410.

Enclosure

c: Central Files
District Files
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

For Official Use Only:

APPLICANT INFORMATION:

1. (x) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPW, Attn: APVG-GGW, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

2. LAND OWNER: (same as well owner)
   Contact Person: Phone:
   Mailing Address:
   Fax:
   E-mail:

3. CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: 91-235A Ohana St., Kapolei, HI 96707
   Fax: 682-1768
   E-mail: wwdhi@lava.net
   Lic #: 21358

WELL & PUMP INFORMATION:

WELL NAME: ERDC-MW-5 Island: Oahu
Address Makua Military Reservation
Tax Map Key: 8 2 01 20
Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK: (check all that apply)
   (x) Construct New Well
   □ Modify Existing Well
   □ Abandon/Seal
   □ Install New Pump
   □ Modify Pump
   "State Well No.
   (If unknown, please call Commission at 587-0225)

4. CONSTRUCTION: □ Drilled □ Dug □ Shaft □ Tunnel
   Is this well part of a battery of wells? □ Yes □ No (Please describe)

5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: (not applicable) gallons per minute
   Pump Type (Check one):
   □ Deep Well Turbine □ Rotary □ Propeller
   □ Submersible □ Rotary-Displacement □ Reciprocating
   □ Centrifugal □ Rotary-Gear □ Impulse

6. PROPOSED USE: (check all that apply)
   □ Domestic (including hotels, stores, etc.) □ Industrial
   □ Municipal (including parks, schools, hospitals)
   □ Irrigation (crop)
   □ Military
   □ No of Acres:

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not applicable gallons per day
   (b) METHOD OF FLOW MEASUREMENT:
   □ Flowmeter □ Open-pipe □ Weir □ Orifice □ Other (explain): Monitoring Well

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS: □ CDUP □ SMAP □ EIS □ EA □ None □ Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
   (If more space is needed, please attach additional sheet)

I declare that the information provided is true and complete to the best of my knowledge and belief.

Well Owner: LTC. Floyd D. Quinton
Landowner: Eric T. Hirano
Contractor: Valley Well Drilling
Date: 5/30/07
Signature

For official use only:

Latitude: Acquifer System No.
Longitude: State Well No.

WCPIPA Form 10/25/00
Honolulu Internet Permit System - Tax Map Key Info

Details

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LAND CONTROL CODES

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Close
October 21, 2002

Ms. Dierdre Mamiya, Administrator
Department of Land and Natural Resources
Land Division, State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Ms. Mamiya & Planners

Subject: Conservation District Use Application for Drilling and Installation of Monitoring Well ERDC-MW-5 at Makua Military Reservation, Oahu.

I am replying to a 3 October 2002 request by Ms. Patty Miyashiro of the Department of Land and Natural Resources (DLNR) for the Army to submit a Conservation District Use Application (CDUA) as part of drilling and installation of the above reference monitoring well at Makua Military Reservation (MMR). The Army submitted a monitoring well permit application on 24 September 2002. The matter was referred to my office for legal review after DLNR requested that the Army also file a CDUA. The Army respectfully declines DLNR's request because we are not required to obtain a CDUA permit under the doctrine of sovereign immunity. In fact, the Army is not required to submit a monitoring well permit but has done so for informational purposes as a courtesy to the State.

Federal activities and installations are subject to state regulation only if Congress relinquishes federal supremacy by clearly and specifically waiving the federal government's immunity from that state regulation. Three Supreme Court cases, Hancock v. Train, 426 U.S. 167 (1976); Department of Energy v. Ohio, 503 US 607 (1992) and United States v. Idaho, 508 U.S. 1 (1993), confirm that such waivers must be unequivocally and strictly construed. There has not been any Congressional waiver of sovereign immunity with regards to the CDUA permits at issue. The Army’s position on this issue is supported by a decision from the United States District Court for the District of Hawaii and is consistent with the approach taken by other military services in Hawaii.

The Army appreciates DLNR’s timely processing for permit ERDC-MW-5 in addition to the processing of eight other well permits for MMR last month (to include well numbers – 3113-2, 3213-08,3213-09,3213-10,3113-03,3113-04,3213-11,3113-05). We look forward to continued spirit of cooperation between our agencies. The Army’s technical point of contact on this matter is Steve Turnbull at 696-2878 x 1050. If you wish to discuss the legal issues further, please feel free to call me at 438-6724.

Very Respectfully,

Jeanne Prussman Ockerman
Attorney Advisor
25th Infantry Division (L) & U.S. Army, Hawaii
Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-1 (Well No. 3113-02)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. To prevent surface contamination, the annular space of all cased non-artesian wells (except monitor wells designed for immediate and short-term monitoring purposes and subsequent abandonment) must be sealed with grout from the ground surface to a minimum depth of 500 feet or 70% of the vertical distance between the ground surface and the top of the aquifer selected for exploration, long-term monitoring, or development, whichever depth is less.

3. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN  
Chairperson

Enclosures
ERROR CONSTRUCTION PERMIT
ERDC-MW-1, Well No. 3113-02

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-1 (Well No. 3113-02) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002  GILBERT S. COLOMA-AGARAN, Chairperson
Expiration Date: September 23, 2004  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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ________________________ Date: __________
Printed Name: ________________________ Firm or Title: ______________
Driller's Signature: ________________________ C-57 License #: __________ Date: __________
Printed Name: ________________________ Firm or Title: ______________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment: USGS Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
            Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-4A (Well No. 3113-03)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson’s approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-4A, Well No. 3113-03

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-4A (Well No. 3113-03) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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 inspection activities in accordance with §13-168-15, Hawaii Administrative Rules.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1½-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

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

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ____________

Printed Name: _________________________________ Firm or Title: _________________________________

Driller's Signature: _____________________________ C-57 License #: _____________________________ Date: ____________

Printed Name: _________________________________ Firm or Title: _________________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

C: USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-4B (Well No. 3113-04)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

[Signature]

GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
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 ERDC-MW-4B (Well No. 3113-04) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. In basalt ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basalt ground water unless otherwise authorized by the Chairperson.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: _______________
Printed Name: ___________________________ Firm or Title: ___________________________
Driller's Signature: ___________________________ C-57 License #: __________ Date: _______________
Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment
c: USGS
Department of Health/ Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-4C (Well No. 3113-05)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

GILBERT S. COLOMA-AGARAN  
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT

ERDC-MW-4C, Well No. 3113-05

Note: This permit shall be prominently displayed at the site until the work is completed

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 ERDC-MW-4C (Well No. 3113-05) at Makua Military Reservation, Oahu, TMK 8-2-01:24, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1.5-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msf) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: ______________
Printed Name: ___________________________ Firm or Title: ___________________________

Driller's Signature: ___________________________ C-57 License #: _____________ Date: ______________
Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.
September 26, 2002

TO: Ms. Dede Mamiya, Administrator
    Land Division

FROM: Linnel T. Nishioka, Deputy Director
      Commission on Water Resource Management

SUBJECT: Request for Chairperson's Signature as Landowner

The attached permit application entails the use of State-owned land and, accordingly, requires the signature of the Chairperson as the landowner. Here, we are requesting your help in affirming the State's ownership of the property and, thereafter, routing the application to the Chairperson for his signature. (We have enclosed the appropriate transmittal memo that contains the affirmation statement.)

Please note that the Chairperson's signature on the permit application completes the application and allows it to be accepted for processing by the Commission. The signature neither represents an endorsement of the applicant's proposal nor an approval for the use of State land; both approvals would be sought by the applicant under separate actions later.

Please inform us if the proposed project is in the Conservation District and, if so, whether the requirements of Chapter 343 have been met.

Lastly, please inform us of the contact person at Land Division who is responsible for transmitting the attached original applications to the Chairperson's office.

LN:ss
Attach.
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
 Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-2 (Well No. 3213-08)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. To prevent surface contamination, the annular space of all cased non-artesian wells (except monitor wells designed for immediate and short-term monitoring purposes and subsequent abandonment) must be sealed with grout from the ground surface to a minimum depth of 500 feet or 70% of the vertical distance between the ground surface and the top of the aquifer selected for exploration, long-term monitoring, or development, whichever depth is less.

3. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

Gilbert S. Coloma-Agaran
Chairperson

Enclosures
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 ERDC-MW-2 (Well No. 3213-08) at Makua Military Reservation, Oahu, TMK 8-1-01:2, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pumping test worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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 approved by the Chairperson.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee’s Signature: ___________________________ Date: ________________
Printed Name: ___________________________ Firm or Title: ___________________________
Driller’s Signature: ___________________________ C-57 License # : ________________ Date: ________________
Printed Name: ___________________________ Firm or Title: ___________________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment c:
USGS
Department of Health’s Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda
U.S. Army
DPW, Attn: APVG-GWV
U.S. Army Garrison
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit
ERDC-MW-3A (Well No. 3213-09)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. All wells (excepting salt-water wells, artesian wells, and temporary monitor wells designed for immediate or short-term monitoring purposes and subsequent abandonment/sealing) shall be constructed with a casing string having a minimum length of solid casing equal to 90 percent of the depth measured from the ground surface to the top of the selected aquifer.

2. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

[Signature]
GILBERT S. COLOMA-AGARAN
Chairperson

Enclosures
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 ERDC-MW-3A (Well No. 3213-09) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1-inch-diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, msl) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCFIS). If the HWCFIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ____________________________ Date: ________________
Printed Name: ____________________________ Firm or Title: ________________

Driller's Signature: ____________________________ C-57 License #: ________________ Date: ________________
Printed Name: ____________________________ Firm or Title: ________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857  

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-3B (Well No. 3213-10)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

**Special Conditions**

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit **does not** authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

[Signature]

GILBERT S. COLOMA-AGARAN  
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-3B, Well No. 3213-10

Note: This permit shall be prominently displayed at the site until the work is completed.

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 ERDC-MW-3B (Well No. 3213-10) at Makua Military Reservation, Kahului, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1x4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

5. In the event that subsurface cultural remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee, well operator, and/or well owner shall stop work and contact the Department's Historic Preservation immediately.

6. 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.

7. The following shall be submitted to the Chairperson within sixty (60) days after completion of work:
   b. Elevation (referenced to mean sea level, MSL) 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 data.

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

9. The well construction permit application is incorporated into this permit by reference and is subject to the Hawaii Well Construction & Pump Installation Standards (January 23, 1997; HWCPIS). If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

10. The permit may be revoked by the Commission 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 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 three (3) months prior to the date the permit expires. If the commencement date is not met, the Commission may revoke the permit after giving the permittee, well operator, and/or well owner notice of the proposed action and an opportunity to be heard.

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

12. 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.

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

Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

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 and understand that I shall not commence work until I and the driller have signed, dated, and returned the permit to the Commission. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $1000 per day starting from the permit date of approval.

Permittee's Signature: ___________________________ Date: _____________

Printed Name: ______________________ Firm or Title: ______________________

Driller's Signature: ___________________________ C-57 License #: ___________ Date: _____________

Printed Name: ______________________ Firm or Title: ______________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health's Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
September 26, 2002

Mr. Jon Fukuda  
U.S. Army  
DPW, Attn: APVG-GWV  
U.S. Army Garrison  
Schofield Barracks, HI 96857

Dear Mr. Fukuda:

Well Construction Permit  
ERDC-MW-3C (Well No. 3213-11)

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned well(s) that authorize well construction activities but excludes installation work for your permanent pump. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 13:

Special Conditions

1. Standard Condition 2 is modified and Standard Condition 7.e. is waived to exempt the permittee from the requirements for conducting pumping tests in accordance with the protocol established in the Hawaii Well Construction and Pump Installation Standards.

This permit does not authorize work for a permanent pump installation.

Please sign and have the contractor sign both permit originals and return one for our files.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. Please provide all the information in this packet to your well drilling contractor. The permittee, well operator, and/or well owner are responsible for all conditions of the permit. This includes ensuring that the well construction contractor, or other party who constructs the well(s), submits a completed Part I of the Well Completion Report form (enclosed) within sixty (60) days after the well construction work is completed. Be advised that you may be subject to fines of up to $1000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Lenore Nakama of the Commission staff at 587-0218.

Aloha,

[Signature]
GILBERT S. COLOMA-AGARAN  
Chairperson

Enclosures
WELL CONSTRUCTION PERMIT
ERDC-MW-3C, Well No. 3213-11

Note: This permit shall be prominently displayed at the site until the work is completed.

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 ERDC-MW-3C (Well No. 3213-11) at Makua Military Reservation, Oahu, TMK 8-1-01:1, subject to the Hawaii Well Construction & Pump Installation Standards (1/23/97) which include but are not limited to the following 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.

2. The well construction permit shall be for construction and testing of the well only. A minimum 1/4-inch diameter monitor tube shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels. The permittee, well operator, and/or well owner shall coordinate with the Chairperson and conduct a pumping test in accordance with the Standards (a pump testing worksheet is attached). The permittee, well operator, and/or well owner shall submit to the Chairperson 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 Chairperson.

3. 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.

4. The permittee, well operator, and/or well owner 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.

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Date of Approval: September 23, 2002
Expiration Date: September 23, 2004

GILBERT S.-COLOMA-AGARAN, Chairperson
Commission on Water Resource Management

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Permittee’s Signature: ___________________________ Date: _______________
Printed Name: ___________________________________________ Firm or Title: ___________________
Driller’s Signature: ___________________________ C-57 License #: _______________ Date: _______________
Printed Name: ___________________________________________ Firm or Title: ___________________

Please sign both copies of this permit, return one to the Chairperson, and retain the other for your records.

Attachment

USGS
Department of Health’s Safe Drinking Water, Wastewater, and Clean Water Branches
Honolulu Board of Water Supply
**SECTION 1: WELL LOCATION INFORMATION**

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquifer System</td>
<td>WAIANAEC</td>
</tr>
<tr>
<td>Aquifer Sector</td>
<td>#4#</td>
</tr>
</tbody>
</table>

**Proposed Use**
- Proposed Withdrawal
- System Sustainable Yield: 54000

**SECTION 2: WELL SECTION DATA** *(enter data in grey cells only)*

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>ft., m.s.l.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>ft., m.s.l.</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>ft.</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>ft.</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>in.</td>
</tr>
<tr>
<td>Total Depth</td>
<td>ft.</td>
</tr>
<tr>
<td>Estimated Head</td>
<td>ft., m.s.l.</td>
</tr>
<tr>
<td>Calculated Aquifer Thickness</td>
<td>90.2 ft.</td>
</tr>
<tr>
<td>County Water Supply (Y/N ?)</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

**Solid Casing**
- Material
- Designation
- Length
- Diameter
- Wall Thickness

**Casing**
- Material
- Designation
- Length
- Diameter
- Wall Thickness
- Openings
- Open Hole Length
- Diameter

**SECTION 3: CHECKLIST** *(values to check are shaded)*

<table>
<thead>
<tr>
<th>Well Depth</th>
<th>Theoretical Thickness of Aquifer</th>
<th>90.2 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
<td></td>
</tr>
<tr>
<td><strong>Depth of Well below Sea Level</strong></td>
<td>20 ft.</td>
<td></td>
</tr>
<tr>
<td><strong>Well Casing</strong></td>
<td><strong>Minimum Wall Thickness</strong></td>
<td><strong>PVC</strong></td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td><strong>County or Non-County</strong></td>
<td><strong>Non-county</strong></td>
</tr>
<tr>
<td><strong>Minimum Thickness per standards</strong></td>
<td>0.237 in.</td>
<td></td>
</tr>
<tr>
<td><strong>Wall Thickness Provided</strong></td>
<td>0.406 in.</td>
<td></td>
</tr>
<tr>
<td><strong>Minimum Length of Solid Casing</strong></td>
<td><strong>90% of ground to top of aquifer</strong></td>
<td>11.52 ft.</td>
</tr>
<tr>
<td><strong>Length of solid casing Provided</strong></td>
<td>10 ft.</td>
<td></td>
</tr>
<tr>
<td><strong>Casing Material</strong></td>
<td><strong>Sch 40</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Annular Space</strong></td>
<td><strong>If the cell above reads #N/A, reference HWCPIS</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Depth of Grouting</strong></td>
<td><strong>Calculated Depth of Grouting</strong></td>
<td>8.96 ft.</td>
</tr>
<tr>
<td><strong>Depth of Grouting provided</strong></td>
<td>8 ft.</td>
<td></td>
</tr>
<tr>
<td><strong>Thickness of Annular Space</strong></td>
<td>3 in.</td>
<td></td>
</tr>
</tbody>
</table>

*(refer to HWCPIS Section 2.2)*

*(disregard if the well is not basal)*

*(refer to HWCPIS Section 2.4 c)*

*(disregard this if this is a non-county well)*

*(refer to HWCPIS Section 2.4 d)*

*(refer to HWCPIS Section 2.4 e)*

*(refer to HWCPIS Section 2.6 c)*

*(refer to HWCPIS Section 2.6 d)*
**SECTION 1: WELL LOCATION INFORMATION**

<table>
<thead>
<tr>
<th>Island</th>
<th>OAHU</th>
<th>Aquifer System</th>
<th>WAIAANAE</th>
<th>Aquifer Sector</th>
<th>#4444</th>
</tr>
</thead>
</table>

**SECTION 2: WELL SECTION DATA**

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>Solid Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material</td>
</tr>
<tr>
<td></td>
<td>Length</td>
</tr>
<tr>
<td></td>
<td>Wall Thickness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cement Grout</th>
<th>Rock Packing</th>
<th>Hole Diameter</th>
<th>Total Depth</th>
<th>Estimated Head</th>
<th>Calculated Aquifer Thickness</th>
<th>County Water Supply (Y/N ?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ft., m. s.l.</td>
<td>ft.</td>
<td>ft. in.</td>
<td>ft.</td>
<td>ft., m.s.l.</td>
<td>90.2 ft.</td>
<td>NO</td>
</tr>
</tbody>
</table>

| Ground Elevation | 22.55 ft. |
| Rock Packing | ft. |
| Hole Diameter | ft. |
| Total Depth | ft. |

| Calulated Aquifer Thickness | 90.2 ft. |
| County Water Supply | NO |

**SECTION 3: CHECKLIST**

<table>
<thead>
<tr>
<th>Well Depth</th>
<th>Theoretical Thickness of Aquifer</th>
<th>90.2 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 Aquifer Thickness</td>
<td>22.55 ft.</td>
<td></td>
</tr>
</tbody>
</table>

| Depth of Well below Sea Level | 25 ft. |

<table>
<thead>
<tr>
<th>Well Casing</th>
<th>Minimum Wall Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material PVC</td>
<td>non-county</td>
</tr>
<tr>
<td>minimum Thickness per standards</td>
<td>0.237 in.</td>
</tr>
<tr>
<td>Wall Thickness Provided</td>
<td>0.406 in.</td>
</tr>
</tbody>
</table>

| Minimum Length of Solid Casing | 16.02 ft. |
| 90% of ground to top of aquifer | 15 ft. |

| Casing Material | Sch 40 |
| Open Hole Length | ft. |
| Open Hole Diameter | in. |

<table>
<thead>
<tr>
<th>Annular Space</th>
<th>Depth of Grouting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Depth of Grouting</td>
<td>12.46 ft.</td>
</tr>
<tr>
<td>Depth of Grouting provided</td>
<td>13 ft.</td>
</tr>
<tr>
<td>Thickness of Annular Space</td>
<td>3 in.</td>
</tr>
</tbody>
</table>

*Too deep* (refer to HWCPIS Section 2.2) *(monitor well)*

*(disregard if the well is not basal)*

*Okay* *(refer to HWCPIS Section 2.4 c)*

*(disregard this if this is a non-county well)*

*Okay* *(refer to HWCPIS Section 2.4 d)*

*Okay* *(refer to HWCPIS Section 2.4 e)*

*Okay* *(refer to HWCPIS Section 2.6 c)*

*(refer to HWCPIS Section 2.6 d)*

*Okay* *(refer to HWCPIS Section 2.6 d)*
**SECTION 1: WELL LOCATION INFORMATION**

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<tr>
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<th>WAIAEA</th>
<th>Aquifer Sector</th>
<th>#4444</th>
</tr>
</thead>
</table>

**Proposed Use**
- System

**Proposed Withdrawal**
- System Sustainable Yield
  - 54000

**Other**
- 4

---

**SECTION 2: WELL SECTION DATA** *(enter data in grey cells only)*

<table>
<thead>
<tr>
<th>Elevation at top of casing</th>
<th>Solid Casing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Elevation</td>
<td>Material</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>Designation</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>Length</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>Diameter</td>
</tr>
<tr>
<td>Total Depth</td>
<td>Wall Thickness</td>
</tr>
</tbody>
</table>

**Estimated Head**
- 62 ft., m.s.l.

**Calculated Aquifer Thickness**
- 90.2 ft.

**County Water Supply (Y/N ?)**
- NO

---

**SECTION 3: CHECKLIST** *(values to check are shaded)*

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**Well Casing**

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<tr>
<td>Wall Thickness Provided</td>
</tr>
<tr>
<td>Minimum Length of Solid Casing</td>
</tr>
<tr>
<td>90% of ground to top of aquifer</td>
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<tr>
<td>Length of solid casing Provided</td>
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**Annular Space**

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<tbody>
<tr>
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<tr>
<td>Depth of Grouting provided</td>
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<td>Thickness of Annular Space</td>
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*Refer to HWCPIS Section 2.2 for depth of grouting.*

*Refer to HWCPIS Section 2.4 c for well casing.*

*Refer to HWCPIS Section 2.4 d for casing material.*

*Refer to HWCPIS Section 2.4 e for annular space.*

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<tr>
<td>County Water Supply (Y/N ?)</td>
</tr>
<tr>
<td>Solid Casing Material</td>
</tr>
<tr>
<td>Designation</td>
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<tr>
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<td>Diameter</td>
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<tr>
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</tr>
<tr>
<td>90% of ground to top of aquifer</td>
</tr>
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<tr>
<td>Casing Material</td>
</tr>
<tr>
<td>Annular Space</td>
</tr>
<tr>
<td>Depth of Grouting</td>
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<tr>
<td>Calculated Depth of Grouting</td>
</tr>
<tr>
<td>Depth of Grouting provided</td>
</tr>
<tr>
<td>Thickness of Annular Space</td>
</tr>
</tbody>
</table>

<p>| Page 1 |</p>
<table>
<thead>
<tr>
<th>Taxkey</th>
<th>Subdiv/Condo</th>
<th>Tnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8-2-1-20</td>
<td></td>
<td>G</td>
<td>FARRINGTON HWY</td>
<td>STATE OF HAWAII</td>
<td></td>
<td></td>
<td>930.58 ac</td>
<td></td>
</tr>
</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
<table>
<thead>
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</thead>
<tbody>
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This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
### PUBLIC RECORD DATA

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<tr>
<th>Taxkey</th>
<th>Subdiv/Condo Tnr</th>
<th>Property Address</th>
<th>Owner/Lessee</th>
<th>Beds</th>
<th>Baths</th>
<th>Land area</th>
<th>Living area</th>
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<th>Taxkey</th>
<th>Subdiv/Condo Tnr</th>
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<th>Beds</th>
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</tbody>
</table>

This information has been supplied by third parties and has not been independently verified by Hawaii Information Service and is, therefore, not guaranteed.
LICENSE SCREEN

[ Look up License Type Codes-> ]
Please click a link listed below to display the other screen.

***** GENERAL LICENSEE *****

LIC ID: CT-21358   Active/Inactive: ACTIVE
NAME: VALLEY WELL DRILLING
TRADE NAME:
STATUS: VALID THRU EXPIRATION DATE, RENEWAL NOTICE SENT
ENTITY: PARTNERSHIP   BUSINESS CODE:
ORIG LIC DATE: 3/16/98   EXPIRE DATE: 9/30/02
CLASS PREFIX: C   SPECIAL PRIVILEGE:
RESTRICTION:   EDUCATION CODE:
BUSINESS ADDR: 91-235 OIHANA ST #A   KAPOLEI HI 96707
MAILING ADDR:

Click here to enter search criteria for prior complaints history ->
For prior complaints and disciplinary history, contact licensing and business information center at (808)587-3295.

<-Back   New Search->
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

For Official Use Only:

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 821, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) WELL OWNER: U.S. Army Contact Person: Jon Fukuda Phone: 656-2878
   Mailing Address: DPW, Attn: APWG-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039 E-mail: fukudaj@schofield.army.mil

(b) LAND OWNER: (same as well owner)
   Mailing Address:
   Fax:

(c) CONTRACTOR: Valley Well Drilling Contact Person: Mike Sober Phone: 682-1767
   Mailing Address: 91-235A Oihana St. Kapolei, HI 96707
   Fax: 682-1768 E-mail: vwdhi@lava.net Lic #: 21358

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)

2. WELL NAME: ERDC-MW-1 Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: Zone: 8 Sec: 2 Pal: 01 Parcel: 24
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK: (check all that apply)
   □ Construct New Well
   □ Install New Pump*
   □ Modify Existing Well*
   □ Modify Pump*
   □ Abandon/Seal*

   *State Well No: ____________________________
   (if unknown, please call Commission at 587-0225)

4. CONSTRUCTION:
   □ Drilled
   □ Dug
   □ Shaft
   □ Tunnel
   Is this well part of a battery of wells? □ Yes □ No (Please describe)

5. PROPOSED PUMP INFORMATION:
   Rated Pump Capacity: Not applicable gallons per minute
   Pump Type (Check one):
   □ Deep Well Turbine
   □ Rotary
   □ Propeller
   □ Submersible
   □ Rotary-Displacement
   □ Reciprocating
   □ Centrifugal
   □ Rotary-Gear
   □ Impulse

6. PROPOSED USE:
   (check all that apply)
   □ Municipal (including hotels, stores, etc.)
   □ Industrial
   □ Domestic (individual, noncommercial water system)
   □ Irrigation (crop)
   □ Other (explain): Monitoring well
   □ No. of Acres:
   □ 0
   □ Yes

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not Applicable gallons per day
   (b) METHOD OF FLOW MEASUREMENT:
       □ Flowmeter
       □ Open-pipe
       □ Well
       □ Orifice
       □ Other(explain)

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS: □ CDUP □ SMAP □ EIS □ EA □ None □ Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS. (If more space is needed, please attach additional sheet)

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within 2 years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 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 correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: Lt. Floyd A. Quintana
Landowner
Signature: ____________________________
Date: ____________________________

Contractor: Valley Well Drilling
Signature: ____________________________
Date: ____________________________
Solid Casing Material:  
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec 5L □ ASTM A53 □ ASTM A139  
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other  
Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)  
ABS Plastic conforming to ASTM F490 and ASTM D1527: (check one): □ Schedule 40 □ Schedule 80  
PVC Plastic conforming to ASTM F490 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120  
Thermoset Plastic: (check one): □ Filament Wound Resin Pipe conforming to ASTM D2996 □ Centrifugally Cast Resin Pipe conforming to ASTM D2997 □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517 □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950 □ PTFE Fluorocarbon Tubing conforming to ASTM D3296 □ FEP Fluorocarbon Tubing conforming to ASTM D3296  

Open Casing Material:  
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec 5L □ ASTM A53 □ ASTM A139  
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other  
Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)  
ABS Plastic conforming to ASTM F490 and ASTM D1527: (check one): □ Schedule 40 □ Schedule 80  
PVC Plastic conforming to ASTM F490 and (ASTM D1785 or ASTM D2241): (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120  
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APPLICATION FOR PERMIT

WELL & PUMP INFORMATION:

1. (a) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Mailing Address: DPW, Attn: APVG-CMW, U.S. Army Garrison-Hawaii, Schofield Barracks, HI
   Phone: 656-2878
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

2. LAND OWNER: (same as well owner)
   Mailing Address:
   Phone:
   Fax:
   E-mail:

3. CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Scher
   Mailing Address: 91-235A Oihana St. Kapolei, HI 96707
   Phone: 682-1767
   Fax: 682-1768
   E-mail: wwdh@lava.net

4. WELL NAME: ERDC-WW-2 3213-08
   Island: Oahu
   Address Makua Military Reservation
   Tax Map Key:
   Zone: 8 Sec: 1 Plat: 01 Parcel 2

5. CONSTRUCTION:
   Drilled
   Dug
   Shaft
   Tunnel
   Is this well part of a battery of wells? DYes XNo (Please describe)

6. PROPOSED WORK:
   XConstruct New Well
   Install New Pump*
   Modify Existing Well*
   Modify Pump*
   Abandon/Seal*
   (State Well No.: [If unknown, please call Commission at 587-0225])

7. PROPOSED PUMP INFORMATION:
   Pump Type (Check one):
   D Deep Well Turbine
   D Rotary
   D Propeller
   D Submersible
   D Rotary-Displacement
   D Reciprocating
   D Centrifugal
   D Rotary-Gear
   D Impulse

   Rated Pump Capacity: Not applicable gallons per minute

8. PROPOSED USE:
   D Municipal (including hotels, stores, etc.)
   D Domestic (individual, noncommercial water system)
   D Industrial
   D Irrigation (crop)
   D Military
   D Other (explain): Monitoring well
   D No of Acres:
   D No.

9. PROPOSED AMOUNT OF WITHDRAWAL:
   Not applicable gallons per day

   METHOD OF FLOW MEASUREMENT:
   D Flowmeter
   D Open-pipe
   D Weir
   D Office
   D Other (explain)

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS:
   D CDUP
   D SMAP
   D EIS
   D EA
   D None
   D Other (explain)

9. REMARKS, EXPLANATIONS:
   This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
   (If more space is needed, please attach additional sheet)

   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 60 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 correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: LTC Floyd A. Quinn
(print legibly)
Signature: 23 Nov 00
Date: 23 Nov 00

Landowner: (print legibly)
Signature: 
Date: 

Contractor: Valley Well Drilling
(print legibly)
Signature: 9/18/02
Date: 

For official use only:
Latitude: 
Longitude: 
Aquifer System No.:
State Well No.:

WCPIPA Form 10/25/00
10. PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

**Hole Diameter:** 10 in.

Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

**Ground Elevation:** 15 ft., msl*

**Solid Casing:** (≥ 90% x (Ground Elev. - Water Level Elev.))

- Total Length: 10 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.406 in.
- Bottom Elevation: -20 ft., msl*

**Open Casing:**

- Perforated
- Screen

- Total Length: 25 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.406 in.
- Bottom Elevation: -20 ft., msl*

**Note:** Neither bentonite nor mud should be used in saturated zone during drilling.

**Open Hole:**

- Length: ________ ft.
- Diameter: ________ in.
- Bottom Elevation: ________ ft., msl*

---

*The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = \( \left( \frac{\text{Water Elevation} - \text{Aquifer Thickness}}{4} \right) \)

Example: Estimated 2 ft. Water Level Elev. ➞ Bottom Elevation of Well Limit = \( \left( \frac{\text{Water Elevation} - \text{Aquifer Thickness}}{4} \right) \) = -18.5 ft.

**Solid Casing Material:**

- **Carbon Steel:** compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
- **Stainless Steel:** (check one):
  - □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
- **ABS Plastic conforming to ASTM F480 and ASTM D1527:** (check one): □ Schedule 40 □ Schedule 80
- **PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241):** (check one): □ Schedule 40 □ Schedule 80 □ Schedule 120
- **Thermoset Plastic:**
  - □ Filament Wound Resin Pipe conforming to ASTM D2996
  - □ Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - □ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - □ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ PEP Fluorocarbon Tubing conforming to ASTM D3296

**Open Casing Material:**

- **Carbon Steel:** compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
- And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
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  - □ PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - □ PEP Fluorocarbon Tubing conforming to ASTM D3296
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/wrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) WELL OWNER: U.S. Army  
   Contact Person: Jon Fukuda  
   Phone: 656-2878  
   Mailing Address: DPW, Attn: APWG-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857  
   Fax: 656-1039  
   E-mail: fukudaj@schofield.army.mil
(b) LAND OWNER: (same as well owner)  
   Contact Person:  
   Phone:  
   Mailing Address:  
   Fax:  
   E-mail:  
(c) CONTRACTOR: Valley Well Drilling  
   Contact Person: Mike Sober  
   Phone: 682-1767  
   Mailing Address: 91-235A Ohiana St. Kapolei, HI 96707  
   Fax: 682-1768  
   E-mail: vwhi@lava.net  
   Lic #: 21358

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)

2. WELL NAME: ERDC-MW-3A  
   Island: Oahu  
   Address: Makua Military Reservation  
   Tax Map Key: 8 2 1 01 1  
   Attach the relevant portion of a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK: (check all that apply)  
   - Construct New Well  
   - Modify Existing Well  
   - Abandon/Seal  
   "State Well No: ________________________ (if unknown, please call Commission at 587-0225)

4. CONSTRUCTION:  
   - Drilled  
   - Dug  
   - Shaft  
   - Tunnel
   "Is this well part of a battery of wells?  
   - Yes  
   - No (Describe)  

5. PROPOSED PUMP INFORMATION:  
   Rated Pump Capacity: Not Applicable  
   gallons per minute
   Pump Type (Check one):  
   - Deep Well Turbine  
   - Rotary  
   - Propeller  
   - Submersible  
   - Rotary-Displacement  
   - Reciprocating  
   - Centrifugal  
   - Rotary-Gear  
   - Impulse  

6. PROPOSED USE: (check all that apply)  
   - Municipal (including hotels, stores, etc.)  
   - Industrial  
   - Domestic (individual, noncommercial water system)  
   "Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections?  
   - Yes  
   - No  
   - Irrigation (crop)  
   - No. of Acres:  
   - Military  
   - No Other (explain): Monitoring Well

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:  
   - Not Applicable  
   gallons per day
   (If more space is needed, please attach additional sheet)
   (b) METHOD OF FLOW MEASUREMENT:  
   - Flowmeter  
   - Open-pipe  
   - Weir  
   - Orifice  
   - Other (explain):  

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS:  
   - CDUP  
   - SMAP  
   - EIS  
   - EA  
   - None  
   - Other (explain)  

9. REMARKS, EXPLANATIONS:  
   "This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS."

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 60 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 correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner  
LTC Floyd A. Quintana  
Signature  
Date  
2/3/02

Landowner  
Signature  
Date

Contractor  
Valley Well Drilling  
Signature  
Date  
4/19/02

For official use only  
Latitude  
Aquifer System No.  
3213-09

Longitude  
State Well No.  

WCPIPA Form 10/25/00
10. PROPOSED WELL SECTION

(Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

Elevation at top of casing 22 ft., msl*

Cement Grout: 13 ft. (min. 70% of distance from ground elevation to top of water surface or 600 ft., whichever is less.)

Annular space between hole and casing (min.3):

3 in.

Total Depth 45 ft.

Rock or Gravel Packing:

32 ft.

Material:

- Crushed Basalt
- Rounded Gravel

Estimated Water Level Elevation: 2.2 ft., msl*

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or, Bottom Elevation of Well Limit = (Water Elevation - 41 x Water Level Elev.)

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = (2. 41 x 2) = 10.5 ft.

Solid Casing Material:

Carbon Steel: compliant with (check one or more):  ❏ ANSI/AWWA C200  ❏ API Spec. 5L  ❏ ASTM A53  ❏ ASTM A139

And compliant with (check one or more):  ❏ ASTM A242  ❏ Type E  ❏ Type S  ❏ Grade B  ❏ Other

ABS Plastic: (check one):  ❏ ASTM A409 (production wells)  ❏ ASTM A512 (monitor wells)

PVC Plastic: (check one or more):  ❏ Schedule 40  ❏ Schedule 80  ❏ Schedule 120

Thermoset Plastic: (check one):

- Filament Wound Resin Pipe conforming to ASTM D3296
- Centrifugally Cast Resin Pipe conforming to ASTM D3296
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

Carbon Steel: compliant with (check one or more):  ❏ ANSI/AWWA C200  ❏ API Spec. 5L  ❏ ASTM A53  ❏ ASTM A139

And compliant with (check one or more):  ❏ ASTM A242  ❏ Type E  ❏ Type S  ❏ Grade B  ❏ Other

Stainless Steel: (check one):  ❏ ASTM A409 (production wells)  ❏ ASTM A512 (monitor wells)

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Thermoset Plastic: (check one):

- Filament Wound Resin Pipe conforming to ASTM D3296
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- FEP Fluorocarbon Tubing conforming to ASTM D3296

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.

Solid Casing:

Total Length: 15 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: 5 ft., msl*

Open Casing:

Perforated Screen
Total Length: 30 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -25 ft., msl*

note: Neither bentonite nor mud should be used in saturated zone during drilling.

Open Hole:

Length: _____________ ft.
Diameter: _____________ in.
Bottom Elevation: _____________ ft., msl*
APPLICATION FOR PERMIT

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

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $250 payable to the Department of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)
1. (a) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Mailing Address: DPW, Attn: APVG-CWV, U.S. Army Garrison HI, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@ Schofield.army.mil
2. (b) LAND OWNER: (same as well owner)
   Contact Person: Phone:
   Mailing Address:
   Fax:
   E-mail:
3. (c) CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Mailing Address: 91-235A Ohiana St. Kapolei, HI 96707
   Fax: 682-1768
   E-mail: wvdhi@lava.net

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)
2. WELL NAME: ERDC-MW-3B 51° 31' 10" Island: Oahu
   Address Makua Military Reservation
   Tax Map Key: 8: Sec 129 Plt 12
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.
3. PROPOSED WORK: (check all that apply)
   X Construct New Well
   Install New Pump
   Modify Existing Well
   Abandon/Seal
   *State Well No.: ________________________________
   (if unknown, please call Commission at 587-0225)
4. CONSTRUCTION: 
   X Drilled
   X Dig
   X Shaft
   X Tunnel
   Is this well part of a battery of wells? 
   Yes
   No (Please describe)______________________________
5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: (Not Applicable) gallons per minute
   Pump Type (Check one):
   Deep Well Turbine
   Rotary
   Submersible
   Rotary-Displacement
   Centrifugal
   Rotary-Gear
   Propeller
   Reciprocating
   Impulse
6. PROPOSED USE: (check all that apply)
   Municipal (including hotels, stores, etc.)
   X Industrial
   Domestic (individual, noncommercial water system)
   Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? Yes
   No
   Irrigation (crop)
   No. of Acres:______________________________
   Military
   X Other (explain): Monitoring Well
7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not Applicable gallons per day
   (b) METHOD OF FLOW MEASUREMENT: Flowmeter
   Open-pipe
   Weir
   Orifice
   Other (explain)

OTHER IMPORTANT INFORMATION:
8. LEGAL REQUIREMENTS: 
   COUP
   SMAP
   EIS
   EA
   None
   Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

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 60 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 correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner
Landowner
Contractor
Signature
Date
Signature
Date

For official use only
Latitude

Aquifer System No.

Longitude

State Well No. 3 213-10

WCPIPA Form 10/25/00
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

Elevation at top of casing: 22 ft., msl*

Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: 20 ft., msl*

Solid Casing Material: (≥ 90% x (Ground Elev.-Water Level Elev.))
- Total Length: 45 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.406 in.
- Bottom Elevation: -25 ft., msl*

Open Casing: (check one)
- Perforated
- Screen
- Total Length: 25 ft.
- Nominal Diameter: 4 in.
- Wall Thickness: 0.406 in.
- Bottom Elevation: -50 ft., msl*

Note: Neither bentonite nor mud should be used in saturated zone during drilling.

Cement Grout: 43 ft.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

Bottom Elevation of Well Limit = \( \frac{\text{Water Elevation}}{4} - \frac{\text{Ground Elevation}}{4} \)

Example: Estimated + 2 ft. Water Level Elev. \( \rightarrow \) Bottom Elevation of Well Limit = \( \frac{2 \times (41 - 10.5)}{4} = -18.5 \) ft.

Solid Casing Material:
- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- ABS Plastic: compliant to ASTM F480 and ASTM D1527: (check one):
  - Schedule 40
  - Schedule 80
  - Schedule 120
- PVC Plastic: compliant to ASTM F480 and (ASTM D1765 or ASTM D2241): (check one):
  - Schedule 40
  - Schedule 80
  - Schedule 120
- Thermoset Plastic: (check one):
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- ABS Plastic: compliant to ASTM F480 and ASTM D1527: (check one):
  - Schedule 40
  - Schedule 80
  - Schedule 120
- PVC Plastic: compliant to ASTM F480 and (ASTM D1765 or ASTM D2241): (check one):
  - Schedule 40
  - Schedule 80
  - Schedule 120
- Thermoset Plastic: (check one): Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 521, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)
1. (a) □ WELL OWNER: U.S. Army
   Mailing Address: DPW, Attn: APWG-GW, U.S. Army Garrison, Schofield Barracks HI 96857
   Fax: 656-1039
   Contact Person: Jon Fukuda
   Phone: 656-2878
   E-mail: fukudaj@schofield.army.mil
(b) □ LAND OWNER: (same as well owner)
   Mailing Address:
   Fax:
   Contact Person:
   Phone:
(c) □ CONTRACTOR: Valley Well Drilling
   Mailing Address: 91-235A Ohiana St. Kapolei, HI 96707
   Fax: 682-1768
   Contact Person: Mike Sober
   Phone: 682-1767
   E-mail: vwdhi@lava.net
   Lic #: 21358

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form)
2. WELL NAME: ERDC-MW-3C
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: Zone 1 Sec 01 Parcel 18
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.
3. PROPOSED WORK:
   (check all that apply)
   □ Construct New Well
   □ Install New Pump*
   □ Modify Existing Well
   □ Modify Pump*
   □ Abandon/Seal*
   □ Abandon/Seal (if unknown, please call Commission at 587-0225)
   *State Well No: (please fill out)
4. CONSTRUCTION:
   □ Drilled
   □ Dug
   □ Shaft
   □ Tunnel
   Is this well part of a battery of wells? □ Yes □ No (Please describe)
5. PROPOSED PUMP INFORMATION:
   (check all that apply)
   □ Municipal (including hotels, stores, etc.)
   □ Domestic (individual, noncommercial water system)
   □ Industrial
   □ Not Applicable
   □ No. of Acres:
   □ No. of Acres: Other (explain):
   □ Irrigation (crop)
   □ Other (explain): Monitoring Well
   □ Military
   □ No
   □ Yes
   □ More service connections?
   □ Days per year or have
   □ Other
   □ Less
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10. PROPOSED WELL SECTION

(Hole Diameter: __________ in.)

Elevation at top of casing: 22 ft., msl*

Cement Grout: 68 ft. (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

Annular space between hole and casing (min. 3): __________ in.

Rock or Gravel Packing: __________ ft.

Material: [ ] Crushed Basalt [ ] Rounded Gravel

Total Depth: 100 ft.

Estimated Water Level Elevation: __________ ft., msl*

Solid Casing: 90% x (Ground Elev. - Water Level Elev.)

Total Length: ______ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl*

Open Casing: [ ] Perforated [ ] Screen

Total Length: ______ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl*

Notes: Neither bentonite nor mud should be used in saturated zone during drilling.

...continued...

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion-Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or, Bottom Elevation of Well Limit = Water Elevation + (1/4 Aquifer Thickness)

Example: Estimated + 2 ft. Water Level Elev. = 2.2 ft. msl*

Solid Casing Material:
Carbon Steel: compliant with (check one or more): [ ] ANSI/AWWA C200  [ ] API Spec. 5L  [ ] ASTM A53  [ ] ASTM A139
And compliant with (check one or more): [ ] ASTM A242  [ ] Type E  [ ] Type S  [ ] Grade B  [ ] Other
Stainless Steel: (check one): [ ] ASTM A409 (production wells)  [ ] ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527 (check one): [ ] Schedule 40  [ ] Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241) (check one): [ ] Schedule 40  [ ] Schedule 80  [ ] Schedule 120
Thermoset Plastic: (check one): [ ] Filament Wound Resin Pipe conforming to ASTM D2996  
[ ] Centrifugally Cast Resin Pipe conforming to ASTM D2997  
[ ] Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517  
[ ] Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950  
[ ] PTFE Fluorocarbon Tubing conforming to ASTM D3296  
[ ] FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:
Carbon Steel: compliant with (check one or more): [ ] ANSI/AWWA C200  [ ] API Spec. 5L  [ ] ASTM A53  [ ] ASTM A139
And compliant with (check one or more): [ ] ASTM A242  [ ] Type E  [ ] Type S  [ ] Grade B  [ ] Other
Stainless Steel: (check one): [ ] ASTM A409 (production wells)  [ ] ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527 (check one): [ ] Schedule 40  [ ] Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241) (check one): [ ] Schedule 40  [ ] Schedule 80  [ ] Schedule 120
Thermoset Plastic: (check one): [ ] Filament Wound Resin Pipe conforming to ASTM D2996  
[ ] Centrifugally Cast Resin Pipe conforming to ASTM D2997  
[ ] Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517  
[ ] Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950  
[ ] PTFE Fluorocarbon Tubing conforming to ASTM D3296  
[ ] FEP Fluorocarbon Tubing conforming to ASTM D3296

...continued...
Application for Permit

State of Hawaii
Commission on Water Resource Management
Department of Land and Natural Resources

Application for Permit

Instructions: Please fill in the diagram on the back of this form. (For further information and updates to this form, visit http://www.state.hilo/dlnr/cwrm.)

Applicant Information:
(Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) Well Owner: U.S. Army
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DPB, Attn: APVG-CGW, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@shoefield.army.mil

2. Well Name: ERDG-MW-4A
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 82-2-01-24

3. Proposed Work:
   (check all that apply)
   x Construct New Well
   x Modify Existing Well
   x Abandon/Seal

4. Construction:
   x Drilled
   x Dug
   x Shaft
   x Tunnel
   Is this well part of a battery of wells? x Yes
   (Please describe)
   Is this one of three in a battery of different depths? x Yes

5. Proposed Pump Information:
   Rated Pump Capacity: Not applicable gallons per minute
   (Check one):
   x Deep Well Turbine
   x Rotary
   x Propeller
   x Submersible
   x Rotary-Displacement
   x Reciprocating
   x Centrifugal
   x Rotary-Gear
   x Impulse

6. Proposed Use:
   (Check all that apply)
   x Municipal (including hotels, stores, etc.)
   x Industrial
   x Domestic (individual, noncommercial water system)
   x Irrigation (crop)
   x No. of Acres:
   x No. of Service Connections:
   x Military
   x Other (explain): Monitoring Well

7. (a) Proposed Amount of Withdrawal:
   Not applicable gallons per day
   (Check one):
   x Flowmeter
   x Open Pipe
   x Weir
   x Orifice
   x Other (explain)

8. Legal Requirements:
   x CDUP
   x SMAP
   x EIS
   x EA
   x None
   x Other (explain)

9. Remarks, Explanations:
   This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

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 abandonment report within 60 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 correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: LTC Floyd A. Quintana
Signature: 2352x 4L
Date: 10/25/00

Contractor: Valley Well Drilling
Signature: 9/19/02
Date: 10/25/00

For official use only:
Latitude: ____________________________
Longitude: ____________________________
Aquifer System No.: 3113-03
State Well No.: ________________________
10. PROPOSED WELL SECTION (Please attach schematic if different from diagram provided below)

Hole Diameter: _______ in.

Elevation at top of casing ______ ft., msl

Minimum of 2' Radius & 4" Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)

Ground Elevation: ______ ft., msl

Cement Grout: 13 ft.
(min. 70% of distance from ground elevation to top of water surface or 200 ft., whichever is less.)

Annular space between hole and casing (min.3) :
3 in.

Total Depth: 45 ft.

Rock or Gravel Packing:
32 ft.
Material: □ Crushed Basalt □ Rounded Gravel

Estimated Water Level Elevation: 2.2 ft., msl

Solid Casing: (± 90% x (Ground Elev.-Water Level Elev))
Total Length: ______ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl*

Open Casing: □ Perforated □ Screen
Total Length: ______ ft.
Nominal Diameter: ______ in.
Wall Thickness: ______ in.
Bottom Elevation: ______ ft., msl*

Open Hole:
Length: ______ ft.
Diameter: ______ in.
Bottom Elevation: ______ ft., msl*

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,
Bottom Elevation of Well Limit = (Water Elevation, 41x[Water Level Elev])

Example: Estimated + 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = (2 x 41 x 2) = 16.4 ft.

Solid Casings Material:
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1657: (check one) □ Schedule 40 □ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) □ Schedule 40 □ Schedule 80 □ Schedule 120
Thermoset Plastic: (check one)
□ Filament Wound Resin Pipe conforming to ASTM D2996
□ Centrifugally Cast Resin Pipe conforming to ASTM D2997
□ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ PTFE Fluorocarbon Tubing conforming to ASTM D3296
□ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casings Material:
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1657: (check one) □ Schedule 40 □ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) □ Schedule 40 □ Schedule 80 □ Schedule 120
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□ Filament Wound Resin Pipe conforming to ASTM D2996
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□ FEP Fluorocarbon Tubing conforming to ASTM D3296
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

[Form details and instructions]

APPLICANT INFORMATION:
(Fill out all three, if applicable, and place a check next to the primary contact)

1. (a) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Mailing Address: DPW, Attn: APYO-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@shofield.army.mil

(b) LAND OWNER: (same as well owner)
   Contact Person: 
   Mailing Address: 
   Fax: 
   E-mail: 

(c) CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Mailing Address: 91-235A Oihana St. Kapolei, HI 96707
   Fax: 682-1768
   E-mail: vwdhi@lava.net
   Lic #: 21358

WELL & PUMP INFORMATION:
(Prepare in the diagram on the back of this form)

2. WELL NAME: ERDC-MW-4B
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8 2 01 24
   Zone: Sec: Plat: Parcel:

3. PROPOSED WORK:
   3) Construct New Well
   4) Abandon/Seal

   *State Well No.: (if unknown, please call Commission at 808-07225)

4. CONSTRUCTION:
   X Drilled
   Dug
   Shaft
   Tunnel

   Is this well part of a battery of wells? X Yes□ No (Describe)

   (This well is one of three in nested pair at different depths MW-4A, 4B, 4C)

5. PROPOSED PUMP INFORMATION:
   Rated Pump Capacity: Not Applicable
   Pump Type (Check one):
   □ Deep Well Turbine
   □ Submersible
   □ Centrifugal
   □ Rotary Turbine
   □ Rotary-Displacement
   □ Rotary-Gear
   □ Propeller
   □ Reciprocating
   □ Impulse

6. PROPOSED USE:
   □ Municipal (including hotels, stores, etc.)
   □ Industrial
   □ Domestic (individual, non-commercial water system)
   □ Military
   □ Irrigation (crop)
   □ No.
   □ Other (explain):

   Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? □ Yes □ No
   □ No. of Acres:

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:
   □ Not Applicable
   □ Other (explain):

   □ Monitoring Well
   □ Gallons per day

(b) METHOD OF FLOW MEASUREMENT:
   □ Flowmeter
   □ Open-pipe
   □ Weir
   □ Orifice
   □ No
   □ Other (explain):

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS:
   □ CDUP
   □ SNAP
   □ EIS
   □ EA
   □ None
   □ Other (explain)

9. REMARKS, EXPLANATIONS:
   This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.

I understand that approval of this application attaches the following 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 60 days after the completion date of the approved work;
3) Monthly water use data shall be submitted to the Commission;
4) Such approval shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Well Owner: Floyd A. Quinata
Signature: 
Date: 2-3-01

Landowner: 
Signature: 
Date: 

Contractor: Valley Well Drilling
Signature: 
Date: 9/15/01

For official use only
Latitude: 
Longitude: 
Aquifer System No.: 
State Well No.: 3112-04

WCPIPA Form 10/25/00
10. PROPOSED WELL SECTION
(Please attach schematic if different from diagram provided below)

Hole Diameter: 10 in.

Elevation at top of casing: 22 ft, msl*

Minimum of 2' Radius & 4' Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft).

Ground Elevation: 20 ft, msl*

Solid Casing: (≥ 90% x (Ground Elev.-Water Elev.)
Total Length: 45 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: 25 ft, msl*

Open Casing:
Perforated X Screen
Total Length: 25 ft.
Nominal Diameter: 4 in.
Wall Thickness: 0.406 in.
Bottom Elevation: -50 ft, msl*

Open Hole:
Length: ____________________________ in.
Diameter: ____________________________ in.
Bottom Elevation: ____________________________ ft, msl*

* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment reports and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,
Bottom Elevation of Well Limit = (Water Elevation - Water Level Elev.)/4
Example: Estimated 2 ft. Water Level Elev. → Bottom Elevation of Well Limit = (2 - 0.04) = -1.96 ft.

Solid Casing Material:
Carbon Steel: compliant with (check one or more): □ ANSI/AWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) □ Schedule 40 □ Schedule 80 □ Schedule 120
Thermoset Plastic: (check one) □ Reinforced Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3226
□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ PTFE Fluorocarbon Tubing conforming to ASTM D3226
□ FEP Fluorocarbon Tubing conforming to ASTM D3226

Open Casing Material:
Carbon Steel: compliant with (check one or more): □ ANSI/WWWA C200 □ API Spec. 5L □ ASTM A53 □ ASTM A139
And compliant with (check one or more): □ ASTM A242 □ Type E □ Type S □ Grade B □ Other
Stainless Steel: (check one): □ ASTM A409 (production wells) □ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (check one) □ Schedule 40 □ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (check one) □ Schedule 40 □ Schedule 80 □ Schedule 120
Thermoset Plastic: (check one) □ Reinforced Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3226
□ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
□ PTFE Fluorocarbon Tubing conforming to ASTM D3226
□ FEP Fluorocarbon Tubing conforming to ASTM D3226
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

APPLICANT INFORMATION:

For further information and updates to this application form, visit http://www.state.hi.us/dlnr/cwrm.

1. (a) \(\square\) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Mailing Address: DPW, Attn: APWG-GW, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukudaj@schofield.army.mil

(b) \(\square\) LAND OWNER: (same as well owner)
   Mailing Address: Valley Well Drilling
   Fax: 682-1768
   E-mail: vwdhi@lava.net

(c) \(\square\) CONTRACTOR: Valley Well Drilling
   Mailing Address: 91-235A Oihana St. Kapolei, HI 96707
   Fax: 682-1768

WELL & PUMP INFORMATION:

2. WELL NAME: ERDC-MW-4C 31\(\frac{3}{4}\) OS
   Island: Oahu
   Address Makua Military Reservation
   Tax Map Key: 8 2 01 24
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK:
   \(\square\) Construct New Well
   \(\square\) Modify Existing Well*
   \(\square\) Abandon/Seal*
   *State Well No:

4. CONSTRUCTION:
   \(\square\) Drilled
   \(\square\) Dug
   \(\square\) Shaft
   \(\square\) Tunnel

5. PROPOSED PUMP INFORMATION:
   Rated Pump Capacity: (Not applicable) gallons per minute
   Pump Type (Check one):
   \(\square\) Deep Well Turbine
   \(\square\) Submersible
   \(\square\) Centrifugal
   \(\square\) Rotary
   \(\square\) Rotary-Displacement
   \(\square\) Propeller
   \(\square\) Reciprocating
   \(\square\) Impulse

6. PROPOSED USE:
   \(\square\) Municipal (including hotels, stores, etc.)
   \(\square\) Domestic (including hotels, stores, etc.)
   \(\square\) Industrial
   \(\square\) Domestic (individual, noncommercial water system)
   \(\square\) Irrigation (crop)
   \(\square\) Military
   \(\square\) Other (explain):

7. (a) PROPOSED AMOUNT OF WITHDRAWAL:
   Not Applicable
gallons per day

(b) METHOD OF FLOW MEASUREMENT:
   \(\square\) Flowmeter
   \(\square\) Open-pipe
   \(\square\) Well
   \(\square\) Office
   \(\square\) Other (explain)

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS:
   \(\square\) CDUP
   \(\square\) SMAP
   \(\square\) EIS
   \(\square\) EA
   \(\square\) None
   \(\square\) Other (explain)

9. REMARKS, EXPLANATIONS:
   This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
   (if more space is needed, please attach additional sheet)

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 60 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 correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

For official use only:

Latitude
Longitude

For Official Use Only:
10. **PROPOSED WELL SECTION** (Please attach schematic if different from diagram provided below)

- **Hole Diameter:** 10 in.
- **Elevation at top of casing:** 22 ft., msl
- **Minimum of 2” Radius & 4” Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)**
- **Ground Elevation:** 20 ft., msl

**Solid Casing Material:**
- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- PVC Plastic conforming to ASTM F490 and ASTM D1597, Schedule 40, Schedule 80
- Thermoset Plastic: (check one): Filament Wound Resin Pipe conforming to ASTM D2996

**Open Casing Material:**
- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- PVC Plastic conforming to ASTM F490 and ASTM D1597, Schedule 40, Schedule 80
- Thermoset Plastic: (check one): Filament Wound Resin Pipe conforming to ASTM D2996

**Cement Grout:**
- 68 ft. (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less)

**Annular space between hole and casing (min.3):**
- 3 in.

**Rock or Gravel Packing:**
- 32 ft.
- Material: Crushed Basalt, Rounded Gravel

**Estimated Water Level Elevation:**
- 2.2 ft., msl*  

Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.

**Open Hole:**
- **Length:**
- **Diameter:**
- **Bottom Elevation:**

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* The approximate elevation must be referenced to mean sea level (msl) at the time of application filing. Final elevations of well components shall be submitted in the Well Completion/Well Abandonment report and referenced to a benchmark which has been established by a surveyor licensed by the State.

For non-salt water Basal Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

**Bottom Elevation of Well Limit = (Water Elevation - 4 x Water Level Elevation) / 4**

Example: Estimated 2 ft. Water Level Elev., Bottom Elevation of Well Limit = (2 - 4 x 0.5) / 4 = -1.5 ft.

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*Solid Casing Material:
Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- PVC Plastic conforming to ASTM F490 and ASTM D1597, Schedule 40, Schedule 80
- Thermoset Plastic: (check one): Filament Wound Resin Pipe conforming to ASTM D2996
- Centrifugally Cast Resin Pipe conforming to ASTM D2997
- Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
- Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296

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**Open Casing Material:**
- Carbon Steel: compliant with (check one or more): ANSI/AWWA C200, API Spec. 5L, ASTM A53, ASTM A139
- Stainless Steel: (check one): ASTM A409 (production wells), ASTM A312 (monitor wells)
- PVC Plastic conforming to ASTM F490 and ASTM D1597, Schedule 40, Schedule 80
- Thermoset Plastic: (check one): Filament Wound Resin Pipe conforming to ASTM D2996
- Centrifugally Cast Resin Pipe conforming to ASTM D2997
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- PTFE Fluorocarbon Tubing conforming to ASTM D3296
- FEP Fluorocarbon Tubing conforming to ASTM D3296
State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
APPLICATION FOR PERMIT

Instructions: Please print in ink or type and send complete application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. Application must be accompanied by 3 copies and a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225. For further information and updates to this application form, visit http://www.state.hi.us/dlnr/wrm.

APPLICANT INFORMATION: (Fill out all three, if applicable, and place a check next to the primary contact)

1. (x) WELL OWNER: U.S. Army
   Contact Person: Jon Fukuda
   Phone: 656-2878
   Mailing Address: DFV, Attn: APVG-GWV, U.S. Army Garrison, Schofield Barracks, HI 96857
   Fax: 656-1039
   E-mail: fukuda@schofield.army.mil

2. ( ) LAND OWNER: State of Hawaii
   Contact Person: Phone:
   Mailing Address:
   Fax:
   E-mail:

3. (x) CONTRACTOR: Valley Well Drilling
   Contact Person: Mike Sober
   Phone: 682-1767
   Mailing Address: 91-235A Ohana St. Kapolei, HI 96707
   Fax: 682-1768
   E-mail: Vwdhi@lava.net
   Lic #: 21358
   (circle one 2-C-57A, or A)

WELL & PUMP INFORMATION: (Please fill in the diagram on the back of this form.)

2. WELL NAME: ERDC-MW-5 3117-06
   Island: Oahu
   Address: Makua Military Reservation
   Tax Map Key: 8 2 01 20
   Zone: Sec: Plat: Parcel:
   Attach the relevant portion of (a) a 7.5-Minute Series USGS topographic map (scale 1:24,000) and include the name of the quad map, and (b) a property tax map, showing well location referenced to established property boundaries.

3. PROPOSED WORK: (check all that apply)
   (x) Construct New Well
   ( ) Modify Existing Well
   ( ) Abandon/Seal
   *State Well No. ____________________________ (If unknown, please call Commission at 587-0225)

4. CONSTRUCTION: (x) Drilled ( ) Aug ( ) Shaft ( ) Tunnel
   Is this well part of a battery of wells? (x) Yes ( ) No (Please describe)

5. PROPOSED PUMP INFORMATION: Rated Pump Capacity: (not applicable) gallons per minute
   Pump Type (Check one):
   ( ) Deep Well Turbine
   ( ) Submersible
   ( ) Centrifugal
   (x) Rotary
   ( ) Rotary-Displacement
   ( ) Rotary-Gear
   ( ) Propeller
   ( ) Reciprocating
   ( ) Impulse
   (x) Other (explain): Monitoring Well

6. PROPOSED USE: (check all that apply)
   ( ) Municipal (including hotels, stores etc.)
   (x) Domestic (individual, noncommercial water system)
   ( ) Other (explain): Monitoring Well
   Does this well serve 25 or more people at least 60 days per year or have 15 or more service connections? (x) Yes ( ) No
   ( ) Irrigation (crop):
   ( ) No. of Acres:
   ( ) Military
   ( ) other (explain): Monitoring Well

7. (a) PROPOSED AMOUNT OF WITHDRAWAL: Not applicable gallons per day
   (b) METHOD OF FLOW MEASUREMENT: (Check one)
   (x) Flowmeter
   ( ) Open-pipe
   ( ) Weir
   ( ) Office
   ( ) Other (explain)

OTHER IMPORTANT INFORMATION:

8. LEGAL REQUIREMENTS: (Check one)
   (x) CDUP
   ( ) SMAP
   ( ) EIS
   ( ) EA
   ( ) None
   ( ) Other (explain)

9. REMARKS, EXPLANATIONS: This monitoring well will be installed for monitoring of groundwater quality and collection of groundwater elevations as part of an EIS.
   (If more space is needed please attach additional sheet)

I understand that approval of this application attaches the following standard conditions: 1) the proposed work is to be completed within two years of the approval date; 2) the contractor shall submit to the Commission a well completion/abandonment report within 60 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 correlative water rights and shall not guarantee the pump capacity of future use of the permitted pump capacity.

Well Owner
Signature
Date

Landowner
Signature
Date

Contractor
Signature
Date

For official use only
Latitude
Aquifer System No.
Longitude
State Well No.

WCPIPA Form 10/25/00
# Proposed Well Section

## Hole Diameter: 10 in.

- **Elevation at top of casing:** 23 ft, msl
- **Minimum of 2' Radius & 4' Thick Concrete Pad (to contain benchmark surveyed to nearest 0.01 ft.)**
- **Ground Elevation:** 200 ft, msl

### Cement Grout:
- **165 ft.** (min. 70% of distance from ground elevation to top of water surface or 500 ft., whichever is less.)

### Annular space between hole and casing (min. 3'):
- 3 in.

### Rock or Gravel Packing:
- 60 ft.

### Material:
- Crushed Basalt
- Rounded Gravel

### Estimated Water Level:
- **Elevation:** 25 ft, msl

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## Solid Casing: (2'90% x (Ground Elev.-Water Level Elev))

- **Total Length:** 170 ft.
- **Nominal Diameter:** 4 in.
- **Wall Thickness:** 0.406 in.
- **Bottom Elevation:** -50 ft, msl

### Open Casing:
- **Total Length:** 55 ft.
- **Nominal Diameter:** 4 in.
- **Wall Thickness:** 0.406 in.
- **Bottom Elevation:** -50 ft, msl

*Note: Neither bentonite nor mud should be used in saturated zone during drilling*

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## Solid Casing Material:
- **Carbon Steel:** compliant with:
  - ANSI/AWWA C200
  - API Spec: 5L
  - ASTM A53
  - ASTM A139
  - ASTM A242
  - Type E
  - Type S
  - Grade B
  - Other

- **ABS Plastic conforming to ASTM F480 and ASTM D1527:**
  - Schedule 40
  - Schedule 80
  - Schedule 120

- **Thermoset Plastic:** (check one):
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

## Open Casing Material:
- **Carbon Steel:** compliant with:
  - ANSI/AWWA C200
  - API Spec: 5L
  - ASTM A53
  - ASTM A139
  - ASTM A242
  - Type E
  - Type S
  - Grade B
  - Other

- **Stainless Steel:** (check one):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)

- **ABS Plastic conforming to ASTM F480 and ASTM D1527:** (check one)
  - Schedule 40
  - Schedule 80

- **PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241):**
  - Schedule 40
  - Schedule 80
  - Schedule 120

- **Thermoset Plastic:** (check one):
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
  - Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
  - PTFE Fluorocarbon Tubing conforming to ASTM D3296
  - FEP Fluorocarbon Tubing conforming to ASTM D3296

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*The approximate elevation must be referenced to mean sea level (msl) at the time of installation filing. Final elevations of well components shall be adjusted based on Well Completion/Well Abandonment reports and elevation of benchmark which has been established by a surveyor.

For non-cellular Basalt Wells - bottom elevation of well should not be deeper than 1/4 of aquifer thickness or,

\[
\text{Bottom Elevation of Well Limit} = (\text{Water Elevation} + 4 \times \text{Water Level Elev})
\]

Example: Estimated + 2 ft. Water Level Elev. \[ \frac{1}{4} \times \text{Water Level Elev} = (2 - \frac{1}{4}) = 1.5 ft. \]

**Solid Casing Material:**
- **Carbon Steel:** compliant with:
  - ANSI/AWWA C200
  - API Spec: 5L
  - ASTM A53
  - ASTM A139

- **ABS Plastic conforming to ASTM F480 and ASTM D1527:**
  - Schedule 40
  - Schedule 80

- **Thermoset Plastic:** (check one):
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517

**Open Casing Material:**
- **Carbon Steel:** compliant with:
  - ANSI/AWWA C200
  - API Spec: 5L
  - ASTM A53
  - ASTM A139

- **Stainless Steel:** (check one):
  - ASTM A409 (production wells)
  - ASTM A312 (monitor wells)

- **ABS Plastic conforming to ASTM F480 and ASTM D1527:**
  - Schedule 40

- **PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241):**
  - Schedule 40

- **Thermoset Plastic:** (check one):
  - Filament Wound Resin Pipe conforming to ASTM D2996
  - Centrifugally Cast Resin Pipe conforming to ASTM D2997
  - Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517

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*Please refer to the HAWAII WELL CONSTRUCTION AND PUMP INSTALLATION STANDARDS to ensure that your as-built is in compliance with applicable standards.*

---

### Casing Material:
- **Cement Grout:**
  - 165 ft.

---

### Annular space between hole and casing (min. 3'):
- 3 in.