**DESCRIPTION**

Date of report: 3/11/87
Person filing report: DENNIS O'SHEA

A. OWNER W. H. Shipman  
NAME No.: 3704-01  
ISLAND: Hawaii

B. GENERAL LOCATION: Keaau

C. DRILLING COMPANY: Richardson Well Drilling

D. TYPE OF RIG: Cable Tool  
DRILLING COMPLETED: 1/26/87  
DRILLER: Miles Frandsen

**E. ELEVATION, msl:** Top of drilling platform: 653.62 ft.  
Bench mark and method used to determine

**Height of drilling platform above ground surface:** 2 ft. elevation: 651.62

**F. HOLE SIZE:**  
18 inch dia. to 653 ft. below drilling platform.  
12 inch dia. to 702 ft. below drilling platform.  

**G. CASING INSTALLED:**  
12 in. I.D. x 5/16 in. wall solid section to 653 ft. below drilling platform.  
in I.D. x in. wall perforated section to ft. below drilling platform.

**Type of perforation**

**H. ANNULUS:** Grouted 0 ft. to 95 ft. below drilling platform.  
Gravel packed 95 ft. to 450 ft. below drilling platform.

**I. PERMANENT PUMP INSTALLATION:**
- Pump type, make, serial no.: Red Jacket 2006 RB-16 MB6  
Capacity: 100 g.p.m.
- Motor type, H.P., voltage, r.p.m.: 25 hp Franklin 460V
- Depth of pump intake setting: 684 ft. below Platform
- Depth of bottom of airliner: 640 ft. below Platform

**HYDROLOGY**

J. INITIAL WATER LEVEL: 518.67 ft. below drilling platform, Date of measurement: 1/26/87
K. INITIAL CHLORIDE: 2 ppm, total depth of well: 300 ft. below drilling platform, Date: 1/28/87

**L. PUMPING TESTS:**
Reference point (R.P.) used: Tension, which elevation is 551.62 ft.

<table>
<thead>
<tr>
<th>Date</th>
<th>Start water level</th>
<th>Start water level</th>
<th>End water level</th>
<th>End water level</th>
<th>Depth of well</th>
<th>Depth of well</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/28/87</td>
<td>518.6 ft. below R.P.</td>
<td>ft. below R.P.</td>
<td>518.6 ft. below R.P.</td>
<td>ft. below R.P.</td>
<td>ft. below R.P.</td>
<td>ft. below R.P.</td>
</tr>
</tbody>
</table>

**Elapsed Time (hours) | Rate (gpm) | Draw-down (ft.) | Cl (ppm) | Temp. (°F)**
0 to 10 | 100 | 0 | 2 | 69 |

**SUBSURFACE FORMATION**

**M. DRILLER’S LOG:**

<table>
<thead>
<tr>
<th>Depth, ft.</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level, ft.</th>
<th>Depth, ft.</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level, ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 45</td>
<td>Broken Grey Basalt</td>
<td>538 to 540</td>
<td>Red Clinkers</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>45 to 80</td>
<td>Red Black Broken Basalt</td>
<td>540 to 615</td>
<td>Green Grey Basalt</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>80 to 140</td>
<td>Brown Decomposed Rock</td>
<td>615 to 620</td>
<td>Red Lava</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>140 to 150</td>
<td>Red Clay Clinkers</td>
<td>620 to 675</td>
<td>Grey Broken Basalt</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>150 to 300</td>
<td>Grey Broken Basalt</td>
<td>675 to 680</td>
<td>Red Lava</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>300 to 430</td>
<td>Brown Grey Broken</td>
<td>680 to 700</td>
<td>Grey Black Basalt</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>430 to 450</td>
<td>Dense Grey Basalt</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td></td>
</tr>
<tr>
<td>450 to 460</td>
<td>Red Broken Basalt</td>
<td>to</td>
<td>to</td>
<td>to</td>
<td></td>
</tr>
<tr>
<td>460 to 535</td>
<td>Dense Grey Basalt</td>
<td>518.6</td>
<td>to</td>
<td>to</td>
<td></td>
</tr>
</tbody>
</table>

**N. REMARKS:**

**INSTRUCTIONS:** Send three (3) copies to: Manager-Chief Engineer, Division of Water and Land Development, P.O. Box 373, Honolulu, Hawaii 96809.

FROM: Ed
TO: D. LUM
PLEASE: See Me
DATE: 4/11/89

REMARKS:
01 July 87
K. L. Ltd.
950
H 96749
KEAAU WELL
Chlorides on C. Brewer ran chloride:
Call from Dennis O'Shea
RICHARDSON DRRG.
<table>
<thead>
<tr>
<th>TO:</th>
<th>INIT:</th>
<th>TO:</th>
<th>INIT:</th>
<th>FOR:</th>
<th>PLEASE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAKALEA, P.</td>
<td></td>
<td>LAU, E.</td>
<td></td>
<td>Approval</td>
<td>See Me</td>
</tr>
<tr>
<td>BAUER, G.</td>
<td></td>
<td>MATHIAS, T.</td>
<td></td>
<td>Signature</td>
<td>Review &amp; Comment</td>
</tr>
<tr>
<td>CHING, F.</td>
<td></td>
<td>NAKAMA, L.</td>
<td></td>
<td>Information</td>
<td>Take Action</td>
</tr>
<tr>
<td>DANBARA, S.</td>
<td></td>
<td>NAKANO, D.</td>
<td></td>
<td></td>
<td>Type Draft</td>
</tr>
<tr>
<td>FUJII, N.</td>
<td></td>
<td>OHYE, M.</td>
<td></td>
<td></td>
<td>Type Final</td>
</tr>
<tr>
<td>GOODING, K.</td>
<td></td>
<td>SAKODA, E.</td>
<td></td>
<td></td>
<td>File</td>
</tr>
<tr>
<td>HIGA, D.</td>
<td></td>
<td>SUBIA, S.</td>
<td>W</td>
<td></td>
<td>Xerox ___ copies</td>
</tr>
<tr>
<td>ICE, C.</td>
<td></td>
<td>SWANSON, S.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMATA, R.</td>
<td>A</td>
<td>UYENO, D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KUNIMURA, I.</td>
<td></td>
<td>YODA, K.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>YOSHINAGA, M.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Housekeeping stuff that was in temp dir.
January 6, 2004

Mr. Jiro Sumada
W.H. Shipman Ltd.
P.O. Box 950
Keeau, HI 96749

Dear Mr. Sumada:

Keeau Shipman Well (Well No. 3804-01)

This letter is being sent to you to confirm a conversation between yourself and Ryan Imata of Commission staff on August 11, 2003.

We understand that you want to reconnect your generator to your pump. Our records indicate that you have a 100 gallon per minute pump installed in your well. Because you will not be replacing your pump, there is no further documentation that needs to be sent to our office.

However, once you begin using your well, you will need to complete and send in Water Use Report Forms to our office. We have attached these forms for your use.

If you have any questions, please contact Ryan Imata of the Commission staff at 587-0255 or toll-free at 974-4000 (Hawaii), 274-3141 (Kauai), 984-2400 (Maui), or 1-800-468-4644 (Lanai & Molokai), extension 70255.

Sincerely,

ERNEST Y.W. LAU
Deputy Director

RI: ss
Attachment
Head Measured
36' as of
1-87 by
USGS survey
(data recorded 6-87)

19384-09
8 - 36 04 - 01

Head Measured

32.8

3-87 by USGS

Survey of Area

Date: 1 6-1987 P.G.
<table>
<thead>
<tr>
<th>TO</th>
<th>INITIAL</th>
<th>PLEASE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. TAGOMORI</td>
<td>See Me</td>
<td><strong>ED, found out if well is open to measure or not. If so, let me know and we'll get USGS to measure.</strong></td>
<td></td>
</tr>
<tr>
<td>A. Ching</td>
<td>Take Action By</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Sakai</td>
<td>Route to Your Branch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Morimoto</td>
<td>Review &amp; Comment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Lum</td>
<td>Draft Reply By</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. Miyamoto</td>
<td>Acknowledge Receipt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. Samuels</td>
<td>Xerox copies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Matsumoto</td>
<td>Return</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P. Matsuo</td>
<td>File</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. Imada</td>
<td>Mail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. Kaneshiro</td>
<td>For Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. Asari</td>
<td>S. Kokubun</td>
<td><strong>No - pump already installed.</strong></td>
<td></td>
</tr>
<tr>
<td>L. Asari</td>
<td>D. Hamada</td>
<td><strong>Diller, Dennis O'Shea will check with Steve Bowles' son re: chlorides. 26/10/87</strong></td>
<td></td>
</tr>
<tr>
<td>L. Asari</td>
<td>L. Nanbu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. Asari</td>
<td>J. Siarot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

GW INDEX/summ.
WELL DRILLING PERMIT

for

W.H. Shipman Estate Well
State Well No. 3604-01
Keaau, Hawaii

TO: W.H. Shipman, Ltd.
P.O. Box 950
Keaau, Hawaii 96749

In accordance with Chapter 166 of Title 13, "Rules for the Control of Ground Water Use in the State of Hawaii", your application to drill State Well No. 3604-01, at Tax Map Key 3:1-6-3-7, is approved subject to the following conditions:

1. A Driller's Well Completion Report (enclosed) shall be submitted to the Division of Water and Land Development within 60 days after completion of the well.

2. Pumping test data shall be submitted to the Division of Water and Land Development within 60 days after testing of the well.

3. Monthly reports of pumpage shall be submitted after the well is put into production.

4. Upon completion of the well, submit an "as-built" drawing of the well and a map showing the exact location of the well.

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

SUSUMU ONO
Chairperson of the Board

Date of Issuance

Enc. (Driller's Report Form)
cc: USGS
Dept. of Health,
Drinking Water Program
Hawaii DWS
DEPARTMENT OF LAND AND NATURAL RESOURCES

APPLICATION FOR (check one)

☐ WELL DRILLING PERMIT
☐ WELL MODIFICATION PERMIT

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

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

1. WELL LOCATION: Island Hawaii Tax Map Key 3:1-6-3-7. Attach a plot plan showing well location referenced to established property boundaries.

2. WATER USER: W. H. Shipman, Ltd. Telephone 966-9325
   Address P. O. Box 950-Kea'au, HI Zip Code 96749

3. PROPOSED DRILLING COMPANY: Richardson Well Drilling Co.

4. PROPOSED WORK: ☐ Drill new well ☐ Deepen ☐ Redrill ☐ Alter ☐ Seal
   ☐ Abandon ☐ Install new pump ☐ Replace pump ☐ Modify pump
   Fill in the diagram and briefly describe the proposed work (use back of form if necessary):
   Grub and grade site; drill 16" diameter hole approximately 650'; case, grout and gravel pack as per drawing; drill 11-3/4" diameter open hole approximately 50'; install pump and test pump.

PROPOSED SECTION OF WELL

- Elevation at top of casing: 537' + H., msl
- Ground Elev. 536 ft. msl
- Cement Grout: 100 ft.
- Hole Diameter: 16" H.
- Total Depth: 700 ft.
- Rock Packing: 480 ft.
- Cement Grout: 120 ft.
- Casing: ☐ Perforated ☐ Screen
- Approximate elev. at filing. Final elev. (msl) by a surveyor licensed by the State must be submitted at start of construction.

5. PROPOSED USE: ☐ Municipal ☐ Military ☐ Agriculture ☐ Industrial ☐ Domestic ☐ Disposal ☐ Other (specify) Source for bottled water

6. PROPOSED AMOUNT OF WITHDRAWAL: ☐ Daily gallons ☐ Monthly gallons ☐ Yearly 2.5 million gallons

7. PROPOSED PUMP OR FLOW CAPACITY: 100 gallons per minute

Signature: Robert E. Cooper Date: 11-3-86
WATER USER: W. H. Shipman, Ltd.

Signature: Robert E. Cooper Date: 11/14/86
LANDOWNER OF WELL SITE

For Official Use: State Well No. 3804-01
DLNR Permit No.
DLNR Application No.
PROPOSED SOURCE WELL FOR POKI LTD

• W.H. SHIPMAH ESTATE
• KEAAU, HAWAII

GROUND LEVEL...

550'±

100'±

650'±

WATER LEVEL

±14 to ±17'

12" I.D. 5/8" WALL A 5/3 ST. BLANK CASING

NEAT CEMENT GROUT 1:1

18" Dia. Drill Hole

Bevelled Casing Shot

Open Hole 11 3/4" Dia.

SPE
7/8/40
DEPARTMENT OF LAND AND NATURAL RESOURCES

APPLICATION FOR  

[WELL DRILLING PERMIT]  [WELL MODIFICATION PERMIT]

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

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

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

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

1. WELL LOCATION: Island Hawaii  Tax Map Key 3:1-6-3-7  Attach a plot plan showing well location referenced to established property boundaries.

2. WATER USER  W. H. Shipman, Ltd.  Telephone 966-9325

3. PROPOSED DRILLING COMPANY: Richardson Well Drilling Co.

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

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

Grub and grade site; drill 16" diameter hole approximately 650'; case, grout and gravel pack as per drawing; drill 11-3/4" diameter open hole approximately 50'; install pump and test pump.

5. PROPOSED SECTION OF WELL

<table>
<thead>
<tr>
<th>Ground Elev.</th>
<th>536 ft., msl*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing Grout</td>
<td>100 ft.</td>
</tr>
<tr>
<td>Hole Dia.</td>
<td>16 in.</td>
</tr>
<tr>
<td>Total Depth</td>
<td>700 ft.</td>
</tr>
<tr>
<td>Rock Packing</td>
<td>480 ft.</td>
</tr>
<tr>
<td>Cement Grout</td>
<td>120 ft.</td>
</tr>
</tbody>
</table>

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

6. PROPOSED USE:  [ ] Municipal  [ ] Military  [ ] Agriculture  [ ] Industrial  [ ] Domestic  [ ] Disposal  [ ] Other (specify) Source for bottled water

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

   [ ] Daily  gallons  [ ] Monthly   gallons  [ ] Yearly  2.5   gallons

7. PROPOSED PUMP OR FLOW CAPACITY:  100 gallons per minute

Signature:  Robert E. Cooper  Date: 11-3-86

signature:  Robert E. Cooper  Date: 11-4-86

For Official Use:

State Well No.  3704 - 01

DLNR Permit No.  DLNR Application No.
PROPOSED SOURCE WELL FOR PUKU LTD

© W.H. Shipman Estate
Kekau, Hawaii

GROUND LEVEL 550’

100’

650’

WATER LEVEL +14 to +17’

12” I.D. 5/8” WALL
15’3” STD. BLANK CASING

MEAT CEMENT GROUT 1:1

18” DIA. DRILL HOLE

BEVELLED CEMENT SHOT

OPEN HOLE 11 3/4” DIA.

SPE
7/8/40
**DIVISION OF WATER AND LAND DEVELOPMENT**

<table>
<thead>
<tr>
<th>TO:</th>
<th>INITIAL:</th>
<th>PLEASE:</th>
<th>REMARKS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. TAGOMORI</td>
<td></td>
<td>See Me</td>
<td></td>
</tr>
<tr>
<td>A. Ching</td>
<td></td>
<td>Take Action By</td>
<td></td>
</tr>
<tr>
<td>H. Sakai</td>
<td></td>
<td>Route to Your Branch</td>
<td></td>
</tr>
<tr>
<td>G. Morimoto</td>
<td></td>
<td>Review &amp; Comment</td>
<td></td>
</tr>
<tr>
<td>D. Lum</td>
<td></td>
<td>Draft Reply By</td>
<td></td>
</tr>
<tr>
<td>S. Miyamoto</td>
<td></td>
<td>Acknowledge Receipt</td>
<td></td>
</tr>
<tr>
<td>S. Samuels</td>
<td></td>
<td>Xerox copies</td>
<td></td>
</tr>
<tr>
<td>G. Matsumoto</td>
<td></td>
<td>Return</td>
<td></td>
</tr>
<tr>
<td>P. Matsuo</td>
<td></td>
<td>File</td>
<td></td>
</tr>
<tr>
<td>N. Imada</td>
<td></td>
<td>Mail</td>
<td></td>
</tr>
<tr>
<td>N. Kaneshiro</td>
<td></td>
<td>For Information</td>
<td></td>
</tr>
<tr>
<td>L. Asari</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MITC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Ground Water Data Coding Schedule

**Reference**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3 104-01</td>
<td>KEEAU</td>
<td>25</td>
<td>29</td>
<td>RICHARD WRLG</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Island (ISL):**
  - 1 - Niihau
  - 2 - Kauai
  - 3 - Oahu
  - 4 - Molokai
  - 5 - Lanai
  - 6 - Maui
  - 7 - Kahoolawe
  - 8 - Hawaii

- **Name or Location (NAME OR LOCATION):**
  - WH SHIPMAN

- **Year Drilled (YR. DRILLED):**
  - 42

- **Driller (DRILLER):**
  - 50

- **Owner or User (OWNER OR USER):**
  - W H SHIPMAN

### Physical Data

<table>
<thead>
<tr>
<th>QUAD MAP</th>
<th>LATITUDE</th>
<th>LONGITUDE</th>
<th>OWNER OR USER</th>
</tr>
</thead>
</table>

#### Type of Const. (SAME AS CARD 1)
- rotary
- percussion
- tunnel
- dug

#### Ground Water Data

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>same as card 1</td>
<td>TYPE OF CONST.</td>
<td>CSG. DIA.</td>
<td>GROUND ELEV.</td>
<td>TOTAL DEPTH</td>
<td>BOT. OF SOLID CSG.</td>
<td>BOT. OF PERF. CSG.</td>
<td>MAJOR USE</td>
<td>YEAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Water Level (feet):**
  - 36

- **Chlorides (mg/l):**
  - 41

- **Rate (gpm):**
  - 46

- **Drawdown (feet):**
  - 50

- **Chlorides Temp. F:**
  - 59

- **Total Drawdown:**
  - 63

**Initial Test**

- **Pumping Test (Values at highest sustained rate):**

**Freq. of Records Available USGS**

- **Annually:**
- **Monthly:**
- **Weekly:**

**Water Supply**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>same as card 1</td>
<td>PUMP CAPACITY (gpm)</td>
<td>ANNUAL DRAFT (mgd)</td>
<td>STATIC HEAD (ft)</td>
<td>MAX. CHLORIDES (mg/l)</td>
<td>MIN. CHLORIDES (mg/l)</td>
<td>AQUIFER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Year:**
  - 35

- **Year:**
  - 37

- **Year:**
  - 39

- **Year:**
  - 41

- **Year:**
  - 43
Date of report: 3/11/87

Person filing report: DENNIS O’SHEA

A. OWNER: W. H. Shipman
NAME: W. H. Shipman
STATE: HAWAI

B. GENERAL LOCATION: Keaau
COUNTY: HAWAI

C. DRILLING COMPANY: Richardson Well Drilling

D. TYPE OF RIG: Cable Tool
DRILLING COMPLETED: 1/26/87
DRILLER: Miles Frandsen

E. ELEVATION, msl: Top of drilling platform is 553.62 ft. Bench mark and method used to determine height of drilling platform above ground surface is 2 ft. elevation.

F. HOLE SIZE:
- 18 inch dia. to 653 ft. below drilling platform.
- 12 inch dia. to 702 ft. below drilling platform.

G. CASING INSTALLED:
- 12 in. I.D. x 5/16 in. wall solid section to 653 ft. below drilling platform.
- 12 in. I.D. x 5/16 in. wall perforated section to 650 ft. below drilling platform.

H. ANNULUS: Grouted 95 ft. to 450 ft. below drilling platform. Gravel packed 95 ft. to 450 ft. below drilling platform.

I. PERMANENT PUMP INSTALLATION:
- Pump type, make, serial no.: Red Jacket 2006 R8-16 MB6
- Capacity: 100 g.p.m.
- Motor type, H.P., voltage, r.p.m.: 25 hp. Franklin 460V
- Depth of pump intake setting: 684 ft. below Platform
- Depth of bottom of airline: 640 ft. below Platform

HYDROLOGY

J. INITIAL WATER LEVEL: 518.67 ft. below drilling platform. Date of measurement: 1/26/87.

K. INITIAL CHLORIDE: 2 ppm, total depth of well: 700 ft. below drilling platform. Date of measurement: 1/26/87.

L. PUMPING TESTS:
- Reference point (R.P.) used: Testing which elevation is 551.62 ft.
- Date: 1/28/87
- Start water level: 518.6 ft. below R.P.
- End water level: 518.6 ft. below R.P.
- Depth of well: 650 ft. below R.P.
- Elapsed Time (hours): 0 to 10
- Rate (gpm): 10
- Drawdown (ft.): 0
- Temp. (°F): 62

SUBSURFACE FORMATION

M. DRILLER’S LOG:

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level (ft.)</th>
<th>Depth (ft.)</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 45</td>
<td>Broken Grey Basalt</td>
<td>535 to 540</td>
<td>518.6</td>
<td>Red Clinkers</td>
<td>518.6</td>
</tr>
<tr>
<td>45 to 80</td>
<td>Red Black Broken Basalt</td>
<td>540 to 615</td>
<td>518.6</td>
<td>Green Grey Basalt</td>
<td>518.6</td>
</tr>
<tr>
<td>80 to 140</td>
<td>Brown Decomposed Rock</td>
<td>615 to 620</td>
<td>518.6</td>
<td>Red Lava</td>
<td>518.6</td>
</tr>
<tr>
<td>140 to 150</td>
<td>Red Clay Clinkers</td>
<td>620 to 675</td>
<td>518.6</td>
<td>Grey Broken Basalt</td>
<td>518.6</td>
</tr>
<tr>
<td>150 to 300</td>
<td>Grey Broken Basalt</td>
<td>675 to 680</td>
<td>518.6</td>
<td>Red Lava</td>
<td>518.6</td>
</tr>
<tr>
<td>300 to 430</td>
<td>Brown Grey Broken</td>
<td>680 to 700</td>
<td>518.6</td>
<td>Grey Black Basalt</td>
<td>518.6</td>
</tr>
<tr>
<td>430 to 450</td>
<td>Dense Grey Basalt</td>
<td>to</td>
<td>518.6</td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>450 to 460</td>
<td>Red Broken Basalt</td>
<td>to</td>
<td>518.6</td>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>460 to 535</td>
<td>Dense Grey Basalt</td>
<td>518.6</td>
<td>518.6</td>
<td>to</td>
<td>to</td>
</tr>
</tbody>
</table>

N. REMARKS:

INSTRUCTIONS: Send three(3) copies to: Manager-Chief Engineer, Division of Water and Land Development, P.O. Box 375, Honolulu, Hawaii 96809.

# DRILLER’S REPORT

## DESCRIPTION

**Date of report:** 3/11/87  
**Person filing report:** DENNIS O’SHEA

**WELL**
- **A. OWNER:** W. H. Shipman  
  **NAME:** No. 3704-01  
  **ISLAND:** Hawaii

**GENERAL LOCATION**
- **B.** Keaau

**DRILLING COMPANY**
- **C.** Richardson Well Drilling

**TYPE OF RIG**
- **D.** Cable Tool  
  **DRILLING COMPLETED:** 1/25/87  
  **DRILLER:** MILES FRANDSEN

**ELEVATION, msl:** Top of drilling platform 553.62 ft.  
**Height of drilling platform above ground surface:** 2 ft.  
**Elevation:** 551.62 ft.

**HOLE SIZE:**
- 18 in. I.D.  
  **Dia. to:** 653 ft. below drilling platform.
- 12 in. I.D.  
  **Dia. to:** 702 ft. below drilling platform.

**CASING INSTALLED:**
- 12 in. I.D. x 5/16 in. wall solid section to 653 ft. below drilling platform.
- 12 in. I.D. x 5/16 in. wall perforated section to 653 ft. below drilling platform.

**ANNULUS:**
- **Grouted:** 0 ft. to 95 ft. below drilling platform.
- **Gravel packed:** 95 ft. to 450 ft. below drilling platform.

**PERMANENT PUMP INSTALLATION:**
- **Pump type, make, serial no.:** Red Jacket 2006 R8-16 MB6  
  **Capacity:** 100 g.p.m.
- **Motor type, H.P., voltage, r.p.m.:** Franklin 460V  
  **Depth of pump intake setting:** 684 ft. below platform  
  **Platform which elevation is:** 551.62 ft.
- **Depth of bottom of airline:** 640 ft. below platform  
  **Platform which elevation is:** 551.62 ft.

## HYDROLOGY

**INITIAL WATER LEVEL:** 518.67 ft. below drilling platform.  
**Date of measurement:** 1/25/87

**INITIAL CHLORIDE:** 2 ppm, total depth of well 100 ft. below drilling platform.  
**Sampling Date:** 1/28/87

### PUMPING TESTS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Rate (gpm)</th>
<th>Drawdown (ft.)</th>
<th>CI (ppm)</th>
<th>Temp. °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/28/87</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of well</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elapsed Time</td>
<td>Rate (gpm)</td>
<td>Drawdown (ft.)</td>
<td>CI (ppm)</td>
<td>Temp. °F</td>
</tr>
<tr>
<td>0 to 110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## SUBSURFACE FORMATION

### M. DRILLER’S LOG:

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level ft.</th>
<th>Depth (ft.)</th>
<th>Rock Description &amp; Remarks</th>
<th>Water Level ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 45</td>
<td>Broken Grey Basalt</td>
<td>535 to 540</td>
<td>Red Clinkers</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>45 to 80</td>
<td>Red Black Broken Basalt</td>
<td>540 to 615</td>
<td>Green Grey Basalt</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>80 to 140</td>
<td>Brown Decomposed Rock</td>
<td>615 to 620</td>
<td>Red Lava</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>140 to 150</td>
<td>Red Clay Clinkers</td>
<td>620 to 675</td>
<td>Grey Broken Basalt</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>150 to 300</td>
<td>Grey Broken Basalt</td>
<td>675 to 680</td>
<td>Red Lava</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>300 to 430</td>
<td>Brown Grey Broken</td>
<td>680 to 700</td>
<td>Grey Black Basalt</td>
<td>518.6</td>
<td></td>
</tr>
<tr>
<td>430 to 450</td>
<td>Dense Grey Basalt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>450 to 460</td>
<td>Red Broken Basalt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>460 to 535</td>
<td>Dense Grey Basalt</td>
<td>518.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### N. REMARKS:

**INSTRUCTIONS:** Send three (3) copies to: Manager-Chief Engineer, Division of Water and Land Development, P. O. Box 373, Honolulu, Hawaii 96809.