PVC pipe is flush joint threaded. Can be revised.

280'

235'

7.5 inch hole

12-inch hole

Ground Surface

Steel casing

147.5 lbs

Bolt Point Deep Manhole Wall

210'

225'

WELL 1

8 steel casing

Pipe solid

Screen

Material:

Sand/Gravel

Drum = 136.1 lb

Drum (not extended)

Melon Baner

421-6831

225'

4'

280'
<table>
<thead>
<tr>
<th>Depth Interval (ft.)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-34</td>
<td>No sample</td>
</tr>
<tr>
<td>34-39</td>
<td>Dense, gray and slightly vesicular aa with some fracturing.</td>
</tr>
<tr>
<td>39-49</td>
<td>Same as above except that some of the vesicles are elongated.</td>
</tr>
<tr>
<td>49-59</td>
<td>Same as above, except core has few vesicles and minor pyroxene (augite ?) phenocrysts.</td>
</tr>
<tr>
<td>59-64*</td>
<td>Clinker and some scoria grading into dense aa core.</td>
</tr>
<tr>
<td>64-69</td>
<td>Dense pahoehoe with round vesicles, core transitions into dense aa with fractures lined with Mn.</td>
</tr>
<tr>
<td>69-74*</td>
<td>Aa clinker</td>
</tr>
<tr>
<td>74-79</td>
<td>Plagioclase feldspar-phyric aa with large irregular vesicles.</td>
</tr>
<tr>
<td>79-84</td>
<td>Aa clinker (?) , some with rounded vesicles.</td>
</tr>
<tr>
<td>84-92</td>
<td>No sample—could be that core did not pick up clinker layer.</td>
</tr>
<tr>
<td>92-94</td>
<td>Dense dark gray aa with some aa clinker in core.</td>
</tr>
<tr>
<td>94-104*</td>
<td>No sample (clinker?)</td>
</tr>
<tr>
<td>104-106</td>
<td>Dense, dark gray aphyric aa.</td>
</tr>
<tr>
<td>106-114</td>
<td>Aa clinker, badly broken.</td>
</tr>
<tr>
<td>114-116*</td>
<td>No sample (clinker?)</td>
</tr>
<tr>
<td>116-117</td>
<td>Dense pahoehoe transitional to aa with elongated vesicles.</td>
</tr>
<tr>
<td>Depth Interval (ft.)</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>117-118</td>
<td>Dense pahoehoe with rounded vesicles.</td>
</tr>
<tr>
<td>118-121</td>
<td>Dense dark gray aa with large vesicles and vertical fracturing.</td>
</tr>
<tr>
<td>121-126</td>
<td>No sample (clinker?)</td>
</tr>
<tr>
<td>126-130</td>
<td>Vesicular aa showing zones where vesicles are concentrated and flattened (127± ft.).</td>
</tr>
<tr>
<td>130-135</td>
<td>No sample (clinker?).</td>
</tr>
<tr>
<td>135-140*</td>
<td>135-137? aa clinker; 137-140 dense vesicular aa.</td>
</tr>
<tr>
<td>140-145</td>
<td>No sample</td>
</tr>
<tr>
<td>145-150</td>
<td>Dense aa with minor vesicles grading into aa clinker.</td>
</tr>
<tr>
<td>150-155*</td>
<td>Aa clinker</td>
</tr>
<tr>
<td>155-168</td>
<td>Dense gray aa</td>
</tr>
<tr>
<td>168-179*</td>
<td>Aa clinker</td>
</tr>
<tr>
<td>179-183</td>
<td>Dense aa with iron oxide staining along fractures.</td>
</tr>
<tr>
<td>183-185</td>
<td>Fractured aa clinker.</td>
</tr>
<tr>
<td>185-188</td>
<td>Dense dark gray aa.</td>
</tr>
<tr>
<td>188-197</td>
<td>Dense and slightly vesicular gray aa. 189-190 aa clinker zone.</td>
</tr>
<tr>
<td>197-210</td>
<td>Dense gray aa with few vesicles and some fracturing.</td>
</tr>
<tr>
<td>210-215*</td>
<td>Same as above, but more clinker.</td>
</tr>
<tr>
<td>215-220</td>
<td>Dense aa with some clinker between 219-220 ft.</td>
</tr>
<tr>
<td>220-225</td>
<td>Pahoehoe transitional to aa, some clinker.</td>
</tr>
<tr>
<td>Depth Interval (ft.)</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>225-230</td>
<td>Vesicular aa, some vesicles are rounded at 228 ft., aa clinker from 229-230 ft.</td>
</tr>
<tr>
<td>230-235*</td>
<td>Pahoehoe transitional to aa. Vesicles vary from round to elongated. Some dense aa near 234-235 ft. with fracturing and iron oxide lining the fractures.</td>
</tr>
<tr>
<td>235-240</td>
<td>Vesicular aa ranging to dense non-vesicular aa at 239-240 ft.</td>
</tr>
<tr>
<td>240-245</td>
<td>Dense aa from 240-241 ft.; 241-245 ft. slightly vesicular aa with iron oxide lining occasional fractures.</td>
</tr>
<tr>
<td>245-250</td>
<td>Gray pahoehoe</td>
</tr>
<tr>
<td>250-255*</td>
<td>Aa clinker and dense aa</td>
</tr>
<tr>
<td>255-260</td>
<td>Dense aa</td>
</tr>
<tr>
<td>260-265</td>
<td>Red spatter (?) mixed in reddish aa clinker.</td>
</tr>
<tr>
<td>265-270</td>
<td>Gray fractured aa</td>
</tr>
<tr>
<td>270-277*</td>
<td>Reddish clinker somewhat fractured.</td>
</tr>
<tr>
<td>277-285</td>
<td>Dense non-vesicular gray aa.</td>
</tr>
<tr>
<td>285-290</td>
<td>Aa clinker (?), highly fractured core sample. At 289 ft. dense aa and small amount of clinker.</td>
</tr>
<tr>
<td>290-300*</td>
<td>Fractured vesicular aa with zones of dense aa.</td>
</tr>
</tbody>
</table>

*Denotes beginning of lava flow unit at beginning of depth interval.
Mr. Chris Kwock
U.S. Navy
Public Works Center
Pearl Harbor, HI 96860

Dear Mr. Kwock:

**Well Completion Reports for Well Nos. 2103-04 & 05**

We have received your Well Completion Reports Part I for the Barbers Point Monitor Wells (Well No. 2103-04 & 05) and acknowledge that they are complete.

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

Sincerely,

EDWIN T. SAKODA
Acting Deputy Director
### PART I. WELL CONSTRUCTION REPORT

1. **State Well No.**: 2103-04  
   **Well Name**: Barbers Point Deep Monitor  
   **Island**: Oahu

2. **Location/Address**: Barbers Point, Oahu  
   **Tax Map Key**: 9-1-16-227

3. **Drilling Company**: USGS Hawaii District

4. **Name of driller who performed work**:  
   **Type of rig/construction**: Air/Rotary

5. **Date(s) Well Construction and pump tests (if any) completed**: 12/22/92

6. **GROUND ELEVATION** (referenced to mean sea level, msl): 146 ft.

7. **Well Bench Mark (description/location)**: Top of PVC casing, Elevation (msl): 147.78 ft.

8. **DRILLER'S LOG**: Please attach geologic log (if available or if required by permit)  
   **NONE**

9. **Depths (ft.) Rock Description, Water Level, Dates, etc.**  
<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock Description, Water Level, Dates, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. **Total depth of well below ground**: 490 ft.

11. **Hole size**:  
   - 12 inch dia. from 0 ft. to 265 ft. below ground  
   - 7.5 inch dia. from 265 ft. to 490 ft. below ground

12. **Casing installed**:  
   - 8 in. I.D. x 7.5 in. wall solid section to 225 ft. below ground  
   - 4 in. I.D. x 3 in. wall perforated section to 490 ft. below ground  
   **Casing Material/Slot Size**: Steel and PVC

13. **Initial water level**: 131 ft. below ground.  
   **Date and time of measurement**: 12/22/92

14. **Initial chloride**: ? ppm  
   **Date and time of sampling**:  
   **Initial temperature**: ? °F  
   **Date and time of measurement**:  
   **PUMPING TESTS**: Reference Point (R.P.) used:  
   - NONE, which elevation is 125 ft.  
   - (1) Step-Drawdown Test Date  
   - Start water level 125 ft. below R.P.  
   - End water level 125 ft. below R.P.

15. **Pump Test Procedures data & graphs (12/17/97 SDPTD & CRPTD Forms) attached**:  
   **Yes**  
   **No**

16. **As-built drawings attached**:  
   **Attached**: Yes  
   **Not Attached**: No

17. **Other remarks/comments**:  
   **On back of this form**

---

**Well Drilling Contractor (print)**:  
**C-57 Lic. No.**:  
**Date**:  
**Surveyor (print)**:  
**Lic. No.**:  
**Date**:  
**Applicant (print)**:  
**Date**:  
**Signature**:  
**Date**:  
**Signature**:  
**Date**:  
**Signature**:  
**Date**:
PART II.  (PERMANENT) PUMP INSTALLATION REPORT

20. Pump Installation Company: ____________________________

21. Name of person performing work: ____________________________

22. Date Pump Installation Completed: ____________________________

23. PUMP INSTALLATION:
   Pump Type, Make, Serial No.: ____________________________
   Capacity: _______ gpm
   Motor type, H.P., Voltage, rpm: ____________________________
   Depth of Pump Intake Setting _______ ft. below ground _______ ft. below ground
   Depth to bottom of airline _______ ft. below ground _______ ft. below ground
   Pumping Head is _______ ft. Type of flow meter: ________ which measures in ______

24. As-built drawings attached attached? _ Yes _ No

25. Other remarks/comments: (See below)

<table>
<thead>
<tr>
<th>Pump Installation Contractor (print)</th>
<th>C-57 Lic. No.</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Applicant (print)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
</table>

8.(cont’d) DRILLER’S LOG (cont’d):

<table>
<thead>
<tr>
<th>Depths (ft.)</th>
<th>Rock Description, Water Level, Dates, etc.</th>
<th>Depths (ft.)</th>
<th>Rock Description, Water Level, Dates, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
<tr>
<td>______ to ______</td>
<td>________________________________</td>
<td>______ to ______</td>
<td>________________________________</td>
</tr>
</tbody>
</table>

19. & 25. Remarks:

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
Barbates Point Deep Monitor Well
2103-4

RP - Top of 4" PVC casing Elev: 147.64
147.76 (from 2)

Ground Surface

Grout Seal

12-inch hole
225'

8" steel casing
225'

4" Sch 40 PVC solid

516'

265' 7 1/2 inch hole

26'

280'

4" Sch 40 screen

* PVC pipe is flush joint, threaded, can be removed.
# WELL COMPLETION REPORT

**2/27/98 WCR Form**

## Partial Completion Report

### Part I. Well Construction & Part II. Permanent Pump Installation

**Instructions:** Please print or type and submit completed report within 60 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 808-587-0300 or 1-800-443-1646 Extension 70225.

### Part I. WELL CONSTRUCTION REPORT

1. **State Well No.:** 2103-05  
   **Well Name:** Barbers Pt Shallow  
   **Island:** Oahu

2. **Location/Address:** Barbers Point, Oahu  
   **Tax Map Key:** 9-1-16-227

#### 3. Drilling Company: GEOLABS-HI

#### 4. Name of driller who performed work: Derek/Francis

#### 5. Type of rig/construction: Coring Rig

#### 6. Date(s) Well Construction and pump tests (if any) completed: 2/10/99

#### 7. GROUND ELEVATION (referred to mean sea level, msl): 148 ft.

   - **Well Bench Mark (description/location):** Top of steel casing  
     **Elevation (msl):** 149.96 ft.

#### 8. DRILLER'S LOG: Please attach geologic log (if available or if required by permit) ATTACHED

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Rock Description, Water Level, Dates, etc.</th>
<th>Depth (ft.)</th>
<th>Rock Description, Water Level, Dates, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


#### 9. Total depth of well below ground: 300 ft.

#### 10. Hole size:

   - 6 inch dia. from 0 ft. to 300 ft. below ground
   - 6 inch dia. from 0 ft. to 300 ft. below ground

#### 11. Casing installed:

   - 1.95 in. I.D. x 1/2 in. wall solid section to 120 ft. below ground
   - 1.95 in. I.D. x 1/2 in. wall perforated section to 300 ft. below ground

   **Casing Material/Slot Size:** Schedule 80 PVC  
   **Slot Size for #3 filter sand**

#### 12. Annulus:

   - Grouted from 0 ft. below ground to 116 ft. below ground
   - Gravel packed from 120 ft. below ground to 300 ft. below ground

#### 13. Initial water level: 14.75 ft. below ground  
   **Date and time of measurement:** 1/16/99 10am

#### 14. Initial chloride: 0.59 ppm  
   **Date and time of sampling:** 12/26/98 11am

#### 15. Initial temperature: 73.5 °F  
   **Date and time of measurement:** 12/26/98 11am

#### 16. PUMPING TESTS: Reference Point (R.P.) used: None, which elevation is ft.

   - **(1) Step-Drawdown Test Date**  
     **Start water level**  
     **End water level**  
   - **(2) Long-term Aquifer Test Date**  
     **Start water level**  
     **End water level**  

#### 17. Pump Test Procedures data & graphs (12/17/97 SDPTD & CRPTD Forms) attached? Yes No

#### 18. As-built drawings attached attached? X Yes No

#### 19. Other remarks/comments: (On back of this form)

**Well Drilling Contractor (print):** Anthony DiLuca  
**C-57 Lic. No.:**  
**Date:**

**Surveyor (print):** Paul Eyre  
**Lic. No.:**  
**Date:**

**Applicant (print):** Anthony DiLucca  
**Date:** 2-8-99
**WELL COMPLETION REPORT**

Part I. Well Construction & Part II. Permanent Pump Installation

Instructions: Please print or type and submit completed report within 60 days after well completion to the Commission on Water Resource Management by 3075 Punchbowl Street, Honolulu, Hawai'i 96813. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 808-586-0225 or 808-587-0844 Extension 70225.

1. **State Well No.:** 2103-05  **Well Name:** Barbers Pt Shallow Mon Island: Oahu  
2. **Location/Address:** Barbers Point, Oahu  
   **Tax Map Key:** 9-1-16-227

### PART I. WELL CONSTRUCTION REPORT

3. **Drilling Company:** GEOLABS-HI  
4. **Name of driller who performed work:** Derek/Francis  
5. **Type of rig/construction:** Coring Rig  
6. **Date(s) Well Construction and pump tests (if any) completed:** 2/10/99  
7. **GROUND ELEVATION** (referred to mean sea level, msl): 148 ft.  
   **Well Bench Mark (description/locaton):** Top of steel casing  
   **Elevation (msl):** 149.96 ft.  
8. **DRILLER'S LOG:** Please attach geologic log if available or if required by permit ATTACHED  
   **Depths (ft.) Rock Description, Water Level, Dates, etc.**  
   ** Depths (ft.) Rock Description, Water Level, Dates, etc.**
   ** Log from cores. Log by Bauer and Eyre, 1/16/99**
   **(If more space is needed, continue on back.)**

9. **Total depth of well below ground:** 300 ft.  
10. **Hole size:** 6 inch dia. from 0 ft. to 300 ft. below ground  
    **Hole size:** 6 inch dia. from 0 ft. to 300 ft. below ground  
    **Hole size:** 6 inch dia. from 0 ft. to 300 ft. below ground  
11. **Casing installed:** 1.95 in. i.d. x 2 in. wall solid section to 120 ft. below ground  
    **Casing Material/Slot Size:** Schedule 80 PVC Slot Size for #3 filter sand  
12. **Annulus:** Grouted from 0 ft. below ground to 116 ft. below ground  
    **Annulus:** Gravel packed from 120 ft. below ground to 300 ft. below ground  
13. **Initial water level:** 14.75 ft. below ground  
14. **Initial temperature:** 73.5 °F  
15. **Date and time of measurement:** 1/16/99 10am  
    **Date and time of sampling:** 12/26/98 11am  
16. **PUMPING TESTS:** Reference Point (R.P.) used: None  
    **(1) Step-Drawdown Test Date:**  
    **End water level**  
    **Start water level**  
    **Start water level**  
    **End water level**  
17. **Pump Test Procedures data & graphs (12/17/97 SOPTD & CRPTD Forms) attached:** Yes No  
18. **As-built drawings attached:** Yes No  
19. **Other remarks/comments:** (On back of this form)

---

**Well Drilling Contractor (print)** C.W. Associates, Inc.  
**C-57 Lic. No.:** C-13040  
**Date:** February 10, 1999

**Surveyor (print)** Clayton S. Mimura  
**Lic. No.:**  
**Date:**

**Applicant (print)**  
**Date:** 2-8-99

W.O. 4142-00
BARBERS POINT PUMPING STATION
WELL SECTION
Not to scale
LETTER OF TRANSMITTAL

DATE: February 10, 1999     JOB NO: W.O. 4142-00

ATTENTION:  Mr. Paul Eyre

RE: Well Drilling Services
    Barbers Point Pumping Station
    Makakilo, Oahu, Hawaii

TO:
    Navy Public Works Center
    Code 650, Building 149
    Pearl Harbor, HI 96860

WE ARE SENDING YOU  X Attached  [ ] Under separate cover via  Client Pick-Up  the following items:

[ ] Shop drawings  [ ] Prints  [ ] Plans  [ ] Samples  [ ] Specifications
[ ] Copy of letter  [ ] Change order  [ ]

<table>
<thead>
<tr>
<th>COPIES</th>
<th>DATE</th>
<th>NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sht</td>
<td>2/10/99</td>
<td></td>
<td>Well Completion Report (duly signed)</td>
</tr>
</tbody>
</table>

THESE ARE TRANSMITTED as checked below:

[ ] For approval  [ ] Approved as submitted  [ ] Resubmit ___ copies for approval
[ ] For your use  [ ] Approved as noted  [ ] Submit ___ copies for distribution
[ ] As requested  [ ] Returned for corrections  [ ] Return ___ corrected prints
[ ] For review & comment  [ ] Other ___  [ ]
[ ] FOR BIDS DUE ____________________ 19___  [ ] RETURNED AFTER LOAN-TO US

REMARKS

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

COPY TO ____________________________

CSM: as Clayton S. Mimura, P.E.

If enclosures are not as noted, kindly notify us at once.

SIGNED: Clayton S. Mimura, P.E.

President
In the record:
Well 2/03-05 @ 29.7' from
the 1965 Water Well.
COMMISSION ON WATER RESOURCE MANAGEMENT

FROM: [Name]
DATE: 1-20-99
SUSPENSE DATE

TO: 
INIT. TO: 

BAUER, G. LUM, A.
CHING, F. NAKAMA, L.
FUJII, N. NAKANO, D.
HARDY, R. OHNO, M.
HIGA, D. SAKODA, E.
HIRANO, E. SUBIA, S.
ICE, C. SWANSON, S.
IMATA, R. UWAIKE, J.
JINNAI, R. UYENO, D.
JOHNS, T. YODA, K.
KUNIMURA, I.

INIT. FOR: PLEASE:

___ Approval ___ See Me
___ Signature ___ Review & Comment
___ Information ___ Take Action
___ Approval ___ Type Draft
___ Signature ___ Type Final
___ Information ___ File

PLEASE:

___ Type Draft ___ Xerox ___ copies
___ Type Final ___ See Me
___ File ___ Review & Comment
___ Xerox ___ copies ___ Take Action

Permits were issued for near Baker's Pt. wells,
it's works that we're delinquent.

2/21/99 - Data - ATR Affirm.
Mr. Chris Kwock
U.S. Navy
Public Works Center
Pearl Harbor, HI 96860

Dear Mr. Kwock:

Our records show that well construction permits were issued for the Barbers Point Deep Monitor Well (Well No. 2103-04) and the Barbers Point Shallow Monitor Well (Well No. 2103-05) on February 25, 1992 (attached).

We understand that these wells have been constructed. Please complete and return the attached Well Completion Reports - Part I and submit as-built sectional drawings as required under Standard Condition 3 of your permits within thirty (30) days.

Please be advised that failure to comply with the terms of your permits may result in fines of up to $1000 per day per source.

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

Sincerely,

EDWIN T. SAKODA
Acting Deputy Director

LN:ss
Attachment
Date: 1/19/99
Sender: Glenn R Bauer
To: W Roy Hardy, Eric T Hirano, Lenore Y Nakama, Mitchell K Ohye
cc: Timothy E Johns
Priority: Normal
Subject: Re[2]: New Navy Obs. Well at Barbers Point Shaft

If there is nothing in the file, then they would need to.

---

Subject: Re: New Navy Obs. Well at Barbers Point Shaft
Author: W Roy Hardy
Date: 1/19/99 8:06 AM

Glenn, does the USGS has to come in for an ATF WCP too?

---

Subject: New Navy Obs. Well at Barbers Point Shaft
Author: Glenn R Bauer
Date: 1/17/99 9:32 AM

I visited the new Navy obs. well at Barbers Point Shaft on Jan. 16, 1999. I met Paul Eyre to log the core samples from the new well and CTD log the monitor well drilled for them by the USGS. I informed Paul that they would have to apply for the new well in an after-the-fact well construction permit. The purpose of their new well is to do profile sampling of the basal lens in the vicinity of their shaft. The USGS well cases off the upper portion of the lens which is where the shaft’s pumps develop water.

The new well is about 25 ft. NE of the USGS well. Though the USGS well is not shown on the well map, its well no. would be 2103-04, and the new obs. well no. should be 2103-05. The new obs. well is 300 ft. deep. The outer casing is 3.75” ID steel casing. The inside casing is 2” PVC.

Though the well does not have an elevation bench mark, we determined the bench mark on the top of the steel casing to be 149.96 ft., msl. This was done by measuring the water level in both the USGS well (where there is a known bench mark of 147.78 ft., msl) and the new obs. well. By knowing the elevation of the water table from the USGS well and adding it to the depth to water determined from the obs well, the new bench mark was established. However, when Paul turns in his after-the-fact application, a surveyed bench mark will accompany the well completion report.

The CTD log of BP Shaft monitor well shows that the TTT is now -92 ft., msl as compared to -106 ft., msl in August. A more detailed review of pumpage and chloride data will accompany the CTD graphs of the data.
<table>
<thead>
<tr>
<th>Depth Interval (ft.)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-34</td>
<td>No sample</td>
</tr>
<tr>
<td>34-39</td>
<td>Dense, gray and slightly vesicular aa with some fracturing.</td>
</tr>
<tr>
<td>39-49</td>
<td>Same as above except that some of the vesicles are elongated.</td>
</tr>
<tr>
<td>49-59</td>
<td>Same as above, except core has few vesicles and minor pyroxene (augite ?) phenocrysts.</td>
</tr>
<tr>
<td>59-64*</td>
<td>Clinker and some scoria grading into dense aa core.</td>
</tr>
<tr>
<td>64-69</td>
<td>Dense pahoehoe with round vesicles, core transitions into dense aa with fractures lined with Mn.</td>
</tr>
<tr>
<td>69-74*</td>
<td>Aa clinker</td>
</tr>
<tr>
<td>74-79</td>
<td>Plagioclase feldspar-phyric aa with large irregular vesicles.</td>
</tr>
<tr>
<td>79-84</td>
<td>Aa clinker (?), some with rounded vesicles.</td>
</tr>
<tr>
<td>84-92</td>
<td>No sample—could be that core did not pick up clinker layer.</td>
</tr>
<tr>
<td>92-94</td>
<td>Dense dark gray aa with some aa clinker in core.</td>
</tr>
<tr>
<td>94-104*</td>
<td>No sample (clinker?)</td>
</tr>
<tr>
<td>104-106</td>
<td>Dense, dark gray aphyric aa.</td>
</tr>
<tr>
<td>106-114</td>
<td>Aa clinker, badly broken.</td>
</tr>
<tr>
<td>114-116*</td>
<td>No sample (clinker?)</td>
</tr>
<tr>
<td>116-117</td>
<td>Dense pahoehoe transitional to aa with elongated vesicles.</td>
</tr>
<tr>
<td>Depth Interval (ft.)</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>117-118</td>
<td>Dense pahoehoe with rounded vesicles.</td>
</tr>
<tr>
<td>118-121</td>
<td>Dense dark gray aa with large vesicles and vertical fracturing.</td>
</tr>
<tr>
<td>121-126</td>
<td>No sample (clinker?)</td>
</tr>
<tr>
<td>126-130</td>
<td>Vesicular aa showing zones where vesicles are concentrated and flattened (127± ft.).</td>
</tr>
<tr>
<td>130-135</td>
<td>No sample (clinker?).</td>
</tr>
<tr>
<td>135-140*</td>
<td>135-137? aa clinker; 137-140 dense vesicular aa.</td>
</tr>
<tr>
<td>140-145</td>
<td>No sample</td>
</tr>
<tr>
<td>145-150</td>
<td>Dense aa with minor vesicles grading into aa clinker.</td>
</tr>
<tr>
<td>150-155*</td>
<td>Aa clinker</td>
</tr>
<tr>
<td>155-168</td>
<td>Dense gray aa</td>
</tr>
<tr>
<td>168-179*</td>
<td>Aa clinker</td>
</tr>
<tr>
<td>179-183</td>
<td>Dense aa with iron oxide staining along fractures.</td>
</tr>
<tr>
<td>183-185</td>
<td>Fractured aa clinker.</td>
</tr>
<tr>
<td>185-188</td>
<td>Dense dark gray aa.</td>
</tr>
<tr>
<td>188-197</td>
<td>Dense and slightly vesicular gray aa. 189-190 aa clinker zone.</td>
</tr>
<tr>
<td>197-210</td>
<td>Dense gray aa with few vesicles and some fracturing.</td>
</tr>
<tr>
<td>210-215*</td>
<td>Same as above, but more clinker.</td>
</tr>
<tr>
<td>215-220</td>
<td>Dense aa with some clinker between 219-220 ft.</td>
</tr>
<tr>
<td>220-225</td>
<td>Pahoehoe transitional to aa, some clinker.</td>
</tr>
<tr>
<td>Depth Interval (ft.)</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>225-230</td>
<td>Vesicular aa, some vesicles are rounded at 228 ft., aa clinker from 229-230 ft.</td>
</tr>
<tr>
<td>230-235*</td>
<td>Pahoehoe transitional to aa. Vesicles vary from round to elongated. Some dense aa near 234-235 ft. with fracturing and iron oxide lining the fractures.</td>
</tr>
<tr>
<td>235-240</td>
<td>Vesicular aa ranging to dense non-vesicular aa at 239-240 ft.</td>
</tr>
<tr>
<td>240-245</td>
<td>Dense aa from 240-241 ft.; 241-245 ft. slightly vesicular aa with iron oxide lining occasional fractures.</td>
</tr>
<tr>
<td>245-250</td>
<td>Gray pahoehoe</td>
</tr>
<tr>
<td>250-255*</td>
<td>Aa clinker and dense aa</td>
</tr>
<tr>
<td>255-260</td>
<td>Dense aa</td>
</tr>
<tr>
<td>260-265</td>
<td>Red spatter (?) mixed in reddish aa clinker.</td>
</tr>
<tr>
<td>265-270</td>
<td>Gray fractured aa</td>
</tr>
<tr>
<td>270-277*</td>
<td>Reddish clinker somewhat fractured.</td>
</tr>
<tr>
<td>277-285</td>
<td>Dense non-vesicular gray aa.</td>
</tr>
<tr>
<td>285-290</td>
<td>Aa clinker (?), highly fractured core sample. At 289 ft. dense aa and small amount of clinker.</td>
</tr>
<tr>
<td>290-300*</td>
<td>Fractured vesicular aa with zones of dense aa.</td>
</tr>
</tbody>
</table>

*Denotes beginning of lava flow unit at beginning of depth interval.
Barbers Point Shaft Monitor Well
CTD Logged January 16, 1999
Corrected Elevation*

WL = 14.75 ft., msl
TTZ -92 ft., msl

*Elevation corrected for instrument correction factor 0.99 measured ft.
Barbers Point Shaft Monitor Well
CTD Logged January 16, 1999
Corrected Elevation*

*Elevation corrected for instrument correction factor 0.99 measured ft.
Barbers Point Monitor Well
Logged August 29, 1998

Water Level 14.69 ft. msl

112 @ -106 ft., msl
Barbers Point Monitor Well
Logged on August 29, 1998

Conductivity

Temperature

Depth Into Water (ft.)
SURVEY BRANCH
Division of Water Resource Management

FROM: Ed
DATE: 3-4-92
FILE IN: Wells-Onha

TO: INITIAL: PLEASE:

E. SAKODA
F. Ching
Check

W. Rozeboom
P. Haraguchi
G. Bauer
N. Fujii
A. Okamura

See Me
Call
Review & Comment
Take Action
Investigate & Report
Draft Reply
Acknowledge Receipt
Type Draft
Type Final

cc: 

Remarks:

For Your:

G. AKITA
L. Nanbu
G. MATSUMOTO
E. LAU
L. CHANG
Y. SHIROMA
M. TAGOMORI
S. Kokubun

Approval
Signature
Information

Hand: deep well is done. Not sure about shallow.
PEarl Harbor Water Management Area

Well Construction Permit

for

Barbers Point Deep Monitor Well
Well No. 2103-04
Ewa Beach, Oahu

TO: U.S. Navy
Navy Public Works Center
Pearl Harbor, HI 96860-5470

In accordance with Department of Land and Natural Resources Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", your application to construct Barbers Point Deep Monitor Well (Well No. 2103-04) is approved, subject to the following conditions:

1. The Division of Water Resource Management (DWRM), P.O. Box 373, Honolulu, HI 96809, shall be notified, in writing, before any work by this permit commences.

2. The well shall be used for monitoring purposes only. Periodic reports of monitoring results shall be submitted to DWRM.

3. The following shall be submitted to DWRM within 30 days after completion of the well:
   b. As-built sectional drawing of the well.

4. The applicant shall comply with all applicable laws, rules, and ordinances.
5. The work proposed in the permit application shall be completed within 24 months from the date of permit issuance.

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

Applicant's Signature: ____________________________ Date: _____________

Printed Name: ___________________________________

Firm or Title: ___________________________________

Please sign and return one copy of this permit to this Department and retain a copy for your record.

Enc. (Well Completion Report form)

cc: USGS
Department of Health
Safe Drinking Water Branch
Ground Water Protection Program
Honolulu Board of Water Supply
PEARL HARBOR WATER MANAGEMENT AREA

WELL CONSTRUCTION PERMIT

for

Barbers Point Shallow Monitor Well
Well No. 2103-05
Ewa Beach, Oahu

TO: U.S. Navy
Navy Public Works Center
Pearl Harbor, HI 96860-5470

In accordance with Department of Land and Natural Resources Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", your application to construct Barbers Point Shallow Monitor Well (Well No. 2103-05) is approved, subject to the following conditions:

1. The Division of Water Resource Management (DWRM), P.O. Box 373, Honolulu, HI 96809, shall be notified, in writing, before any work by this permit commences.

2. The well shall be used for monitoring purposes only. Periodic reports of monitoring results shall be submitted to DWRM.

3. The following shall be submitted to DWRM within 30 days after completion of the well:
   b. As-built sectional drawing of the well.

4. The applicant shall comply with all applicable laws, rules, and ordinances.
5. The work proposed in the permit application shall be completed within 24 months from the date of permit issuance.

WILLIAM W. PATY, Chairperson
Commission on Water Resource Management

Date of Issuance: FEB 25, 1997

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

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

Please sign and return one copy of this permit to this Department and retain a copy for your record.

Enc. (Well Completion Report form)

cc: USGS
    Department of Health
    Safe Drinking Water Branch
    Ground Water Protection Program
    Honolulu Board of Water Supply
APPLICATION FOR: Well Construction or Pump Installation PERMIT

Instructions: Please print or type and send completed application with attachments to the Div. of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. (Filing fee waived for government agencies.) If necessary, phone 548-7643, Hydrology/Geology Section for assistance.

1. WELL LOCATION/NAME: Barbers Point Shaft, Deep Monitoring Well

Address Barbers Point Shaft, Farrington Highway
Tax Map Key 9-1-16-227
(Attach a USGS map, scale 1"=2000', and a property tax map showing well location referenced to established property boundaries.)

2. (a) WELL OWNER:

Firm Name U.S. Navy
Contact Person Chris Kwok
Address Navy Public Works Center
Pearl Harbor, HI Ph. (808)474-0388
96860-5470

(b) LANDOWNER:

Firm Name U.S. Navy
Contact Person Chris Kwok
Address Navy Public Works Center
Pearl Harbor, HI Ph. (808)474-0388
96860-5470

3. PROPOSED CONTRACTOR:

Name U.S. Geological Survey
Contractor's License No.
Address 677 Ala Moana Boulevard, Suite 415, Honolulu, HI 96813 Ph. (808)541-2653

4. PROPOSED WORK:

- Drill New Well
- Deepen
- Redrill
- Alter
- Seal
- Abandon
- Install New Pump
- Replace Pump
- Modify Pump

(Briefly describe the proposed work and fill in the diagram on the back of this form.)

5. PROPOSED USE:

- Municipal (including hotels, stores, etc.)
- Military
- Domestic (individual, noncommercial water sys.)
- Industrial
- Irrigation (specify)
- Monitor Well
- Other (specify)

6. PROPOSED AMOUNT OF WITHDRAWAL:

0 gallons per day

7. PROPOSED PUMP INFORMATION:

- None

Pump Type:
- Vertical Turbine
- Submersible
- Centrifugal

Motor:
- Diesel
- Gas
- Electric, at a rated horsepower of

Rated Pump Capacity:

Gallons per minute

Well Owner (print) U.S. Navy
G. MATSUSHITA
Signature 6 November 1991

Landowner (print) U.S. Navy
G. MATSUSHITA
Signature 6 November 1991

For Official Use Only:

Field Checked By
Date

Latitude

Longitude

Hydrologic Unit
State Well No. 3-2103-04
BP Drop No.
Briefly describe the proposed work:

DEEP MONITORING WELL DESIGNED TO MONITOR

FROM 100' BELOW WATER SURFACE TO TRANSITION ZONE.

NOTE: 300' BELOW SURFACE.

PROPOSED SECTION OF WELL

Elevation at top of casing:
161 ft., msl.

Cement Grout: 260 ft.

Hole Diameter: 12” in.

Total Depth: 960 ft.

Rock Packing: 6 ft.

6 1/2" Hole plus Surface casing.

SURFACE CASING - 8” STEEL.
260' - 100' Below Water Level.

Ground Elevation: 160 ft., msl.*

Solid Casing:

Material: PVC
Length: 700 ft.
Diameter: 4” in.
Wall thickness: sch. 40 in.

Casing: ☐ Perforated ☐ Screen

Material: PVC
Length: 700 ft.
Diameter: 4” in.
Wall thickness: sch. 40 in.
Openings: sq. in./L.F.

Open Hole:
Length:
Diameter:

*Approximate elevation at time of filing application. Final elevation (msl) by a surveyor licensed by the State must be submitted at start of construction.
APPLICATION FOR: ☐ Well Construction or ☐ Pump Installation PERMIT

Instructions: Please print or type and send completed application with attachments to the Div. of Water Resource Management, P.O. Box 373, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of $25.00 payable to the Dept. of Land and Natural Resources. (Filing fee waived for government agencies.) If necessary, phone 548-7643, Hydrology/Geology Section for assistance.

1. WELL LOCATION/NAME: Barbers Point Shaft, Shallow Monitoring Well
   Island: Oahu
   Address: Barbers Point Shaft, Farrington Highway
   Tax Map Key: 9-1-16-227
(Attach a USGS map, scale 1"=2000’, and a property tax map showing well location referenced to established property boundaries.)

2. (a) WELL OWNER:
   Firm Name: U.S. Navy
   Contact Person: Chris Kwock
   Address: Navy Public Works Center
   Pearl Harbor, HI
   Ph: (808)474-0388
   96860-5470

   (b) LANDOWNER:
   Firm Name: U.S. Navy
   Contact Person: Chris Kwock
   Address: Navy Public Works Center
   Pearl Harbor, HI
   Ph: (808)474-0388
   96860-5470

3. PROPOSED CONTRACTOR:
   Name: U.S. Geological Survey
   Contractor's License No.: ___________
   Address: 677 Ala Moana Boulevard, Suite 415, Honolulu, HI 96813
   Ph: (808)541-2653

4. PROPOSED WORK:
   ☐ Drill New Well    ☐ Deepen    ☐ Redrill
   ☐ Alter    ☐ Seal    ☐ Abandon
   ☐ Install New Pump    ☐ Replace Pump    ☐ Modify Pump
   (Briefly describe the proposed work and fill in the diagram on the back of this form.)

5. PROPOSED USE:
   ☐ Municipal (including hotels, stores, etc.)    ☐ Military
   ☐ Domestic (individual, noncommercial water sys.)    ☐ Industrial
   ☐ Irrigation (specify)    ☐ Other (specify)    ☐ Monitor Well

6. PROPOSED AMOUNT OF WITHDRAWAL: ______ gallons per day

7. PROPOSED PUMP INFORMATION:
   Pump Type: None
   Motor: None
   Rated Pump Capacity: None
   Gallons per minute ______
   Electric, at a rated horsepower of ______

Well Owner (print) ___________________________ U.S. Navy
Signature ___________________________ G. MATSUISHITA
Date 6 November 1991

Landowner (print) ___________________________ U.S. Navy
Signature ___________________________ G. MATSUISHITA
Date 6 November 1991

For Official Use Only:
Field Checked By ___________________________ Hydrologic Unit
Date ___________________________ State Well No. 3 - 2/103-05
Latitude: ___________________________ State Well No. 3 - 2/103-05
Longitude: ___________________________ Shallow Mon
Briefly describe the proposed work:

DRILL SHALLOW MONITORING WELL DESIGNED TO MONITOR

UPPER MOST 100' OF AQUIFER.


PROPOSED SECTION OF WELL

Elevation at top of casing: 160.5 ft., msl.

Cement Grout: 150 ft.

Hole Diameter: 12 in.

Total Depth: 260 ft.

Rock Packing: _____ ft.

Solid Casing:

Material: 4" PVC

Length: 133' ft.

Diameter: 4" in.

Wall thickness: SCH. 40 in.

Casing: ☐ Perforated ☐ Screen

Material: PVC

Length: 133' ft.

Diameter: 4" in.

Wall thickness: SCH. 40 in.

Openings: _______ sq. in./L.F.

Open Hole:

Length: __________

Diameter: __________ in.

Ground Elevation: 160 ft., msl*

SURFACE CASING 100'

8" SHAL

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