



DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
PEARL HARBOR, HAWAII 96860-5101

RECEIVED
SAFE DRINKING WATER BRANCH

FEB - 1 2010

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5090
Ser N45/ 141
January 29, 2010

CERTIFIED MAIL NO. 7007 3020 0002 3046 6932

Mr. Stuart Yamada Chief
Hawaii State Department of Health
Environmental Management Division
Safe Drinking Water Branch
919 Ala Moana Boulevard Room 308
Honolulu HI 96814

Dear Mr. Yamada:

SUBJECT: PUBLIC WATER SYSTEM NO. 360, PEARL HARBOR WATER SYTEM
SANITARY SURVEY REPORT

We would like to acknowledge receipt of the sanitary survey report on the Pearl Harbor water system. We appreciate the assistance and technical guidance provided by your staff during the November 2, 2009 survey.

The sanitary survey report identified two recommendations. Per your letter of December 9, 2009, we are providing our response in enclosure 1, which lists the actions taken.

Should you have any questions regarding this matter, please contact Julie Muraoka at 471-1171, extension 338.

Sincerely,

R. M. WAKUMOTO
Division Head, Compliance
Regional Environmental Department
By direction of the
Commander

Enclosure: 1. Pearl Harbor Sanitary Survey Response

PEARL HARBOR WATER SYSTEM PWS 360
NAVY RESPONSE TO DOH SANITARY SURVEY OF NOV 2, 2009

	Significant Deficiency	Corrective plan of action	Action Complete or Incomplete	Expected date of completion
n/a	NONE			
	DOH Recommendation	Corrective plan of action	Action Complete or Incomplete	Expected date of completion
1	<u>Halawa Storage Tanks S-1 and S-2:</u> There are some areas of light rusting on the roof, sidewalls, and around the roof access hatch for both tanks. Recommend keeping a close eye on these rust areas and repair, resurface, and repaint as necessary.	The tanks will be periodically checked. Repairing, resurfacing and repainting will be done, as necessary.	Ongoing	Ongoing
2	<u>Halawa Storage Tanks S-1 and S-2:</u> The SDWB was not able to inspect the overflow outlet pipes for both tanks in order to verify the condition and if the outlets had either a screen or flapper valve. Recommend providing photo evidence of the outlets and installing either a stainless steel screen or flapper valve if needed.	Halawa Storage Tanks S-1 and S-2 have a combined overflow outlet with a stainless steel screen. A picture of the stainless steel screen at the combined overflow outlet is provided on the following page.	Complete	

PEARL HARBOR WATER SYSTEM PWS 360
NAVY RESPONSE TO DOH SANITARY SURVEY OF NOV 2, 2009

Photograph of stainless steel screen at combined overflow outlet
for the Halawa storage tanks S-1 and S-2.



FILE 7

December 9, 2009

Commander, Navy Region Hawaii
c/o Code N45, Ralph Wakumoto
Regional Environmental Department
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Dear Mr. Wakumoto:

SUBJECT: PUBLIC WATER SYSTEM NO. 360, PEARL HARBOR WATER SYSTEM
TRANSMITTAL OF SANITARY SURVEY REPORT

Thank you for the assistance and information provided during the sanitary survey inspection of the Pearl Harbor water system conducted on November 2, 2009.

Enclosed is a copy of the Pearl Harbor water system sanitary survey report. A sanitary survey of a public water system is a periodic review of the system's facilities, operation and maintenance practices, and records to assure that proper conditions, policies, and practices are in effect for that water system. Maintaining of minimum standards of operation and maintenance is the responsibility of the operator.

The Department of Health requests a written response by January 29, 2010, to the recommendations in the reports. Each recommendation should be addressed as completed or if incomplete, please provide a proposed completion date.

If there are any questions, please call Mr. Kumar Bhagavan of the Safe Drinking Water Branch at 586-4258.

Sincerely,



THOMAS E. ARIZUMI, P.E., CHIEF
Environmental Management Division

KB:slm
Enclosure
SANSURV(360B1209.DOC)

DEC 10 2009

FILE COPY

November 24, 2009

Commander, Navy Region Hawaii
c/o Code N45, Ralph Wakumoto
Regional Environmental Department
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Dear Mr. Wakumoto:

SUBJECT: PUBLIC WATER SYSTEM NO. 360, PEARL HARBOR WATER SYSTEM
TRANSMITTAL OF SANITARY SURVEY REPORT

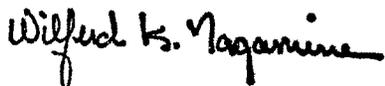
Thank you for the assistance and information provided during the sanitary survey inspection of the Pearl Harbor water system conducted on November 2, 2009.

Enclosed is a copy of the Pearl Harbor water system sanitary survey report. A sanitary survey of a public water system is a periodic review of the system's facilities, operation and maintenance practices, and records to assure that proper conditions, policies, and practices are in effect for that water system. Maintaining of minimum standards of operation and maintenance is the responsibility of the operator.

The Department of Health requests a written response by January 14, 2010, to the recommendations in the reports. Each recommendation should be addressed as completed or if incomplete, please provide a proposed completion date.

If there are any questions, please call Mr. Kumar Bhagavan of the Safe Drinking Water Branch at 586-4258.

Sincerely,



FOR THOMAS E. ARIZUMI, P.E., CHIEF
Environmental Management Division

KB:slm
Enclosure
SANSURV(360B1109.DOC)

FILE COPY

October 16, 2009

Commander, Navy Region Hawaii
Attn: Code N45, Ralph Wakumoto
Regional Environmental Department
850 Ticonderoga St., Suite 110
Pearl Harbor, Hawaii 96860-5101

Dear Dr. Wakumoto:

SUBJECT: PUBLIC WATER SYSTEM NO. 360, PEARL HARBOR
CONFIRMATION OF SANITARY SURVEY

This letter is to confirm the telephone conversation between Kyle Teraoka and Kumar Bhagavan of my staff, in which we requested a sanitary survey of the Pearl Harbor water system. The survey has been scheduled for November 2, 2009.

Sanitary surveys are conducted to evaluate the adequacy of the source, facilities, equipment, operation, and maintenance of a water system. The survey is an essential part of the rules administered by the Safe Drinking Water Branch. The survey is beneficial to both the Department and the purveyor because it allows our staff to become familiar with your water system and provides your staff with information about maintaining and operating your system. If violations or problems do occur, this knowledge facilitates analysis of the situation.

In order to conduct the survey, we appreciate your assistance in providing access to your facilities. We also request that staff who are knowledgeable about the water system be present during the survey. Please have the following information available the day of the survey:

- 1) SYSTEM FLOW - the total system demand, number of service connections and population served. We would appreciate having an updated copy of the water system map or schematic for our files.

Mr. Ralph Wakumoto
October 16, 2009
Page 2

- 2) FACILITIES - Information on the facilities and their operation. For example:
- a) Sources: well flow rates & pump TDH; pump controls; sampling and monitoring locations; disinfectant usage (est.) and MSDS sheets; safety equipment and training (as applicable); proximity to cesspools, leach fields or other potentially contaminating land use activities;
 - b) Reservoirs: site and tank security, storage capacity, level control system, inlet/outlet configuration, overflow piping, sampling locations, maintenance schedule; and
 - c) Distribution System: pipe materials and sampling locations, pressure reducing stations; Lead and Copper Rule compliance; any emergency response, backflow prevention, leak detection or corrosion control plans.

If, for any reason, you are unable to accommodate our request for this survey, or if you have any questions, please call Kumar Bhagavan at 586-4258.

Sincerely,

STUART YAMADA, P.E., CHIEF
Safe Drinking Water Branch

KB:slm

c: Mr. Kyle Teraoka
NAVPAC HAWAII
400 Marshall Road
Pearl Harbor, HI 96860-3139

SANSURV(360A1009.DOC)

SANITARY SURVEY OF THE PEARL HARBOR WATER SYSTEM

The Safe Drinking Water Branch (SDWB) performed a sanitary survey of the Pearl Harbor water system (PWS No. 360) on November 2, 2009. The sanitary survey was conducted by Kumar Bhagavan of the SDWB staff. The survey took approximately six hours to complete, not including commute time.

According to the Department of Health SDWB records, the water system is owned and operated by NAVFAC (Naval Facilities Engineering Command) Hawaii. Mr. Russell Okita, Mr. Kyle Teraoka, Ms. Lauren Arizumi, and Ms. Julie Muraoka, NAVFAC Hawaii engineers, were present during the survey. The operators of the system, Mr. Neal Kabei, Mr. David Cain, and Mr. Flynn Garcia, were also present during the survey.

The Pearl Harbor water system provides drinking water to the Pearl Harbor Naval Shipyard, Naval Station, FISC, Subase, Bishop Point, the Navy Exchange/Commissary, and the Navy/Marine Golf Course. Additionally, the system serves the following military communities: Manana Housing, Pearl City Junction, Pearl City Peninsula, Waipio Peninsula, West Loch, Iroquois Point Housing, Puuloa Housing, Ford Island, McGrew Point Housing, Camp Smith, Halawa Housing, Coast Guard Housing, Red Hill Housing, Halsey Terrace, and the Eastern Housing complex.

The Pearl Harbor water system also provides drinking water to the Army's Aliamanu system (PWS No. 337) and the Hickam Air Force Base system (PWS No. 350). The system is also connected to the Barbers Point system (PWS No. 355) for emergency purposes only (connection valve is normally closed).

All of the water system facilities are located in highly secured areas and special permission must be obtained in advance in order to inspect them. There is 24-hour security patrolling all of the facilities. The system is spread out over a distance of approximately 8 miles. The elevation ranges from 5 feet (Hickam Air Force Base) to 850 feet (Camp Smith) above mean seal level.

The water system facilities consist of three sources, two large storage tanks, four smaller storage tanks, several booster pump stations, and approximately 400 miles of pipeline.

SYSTEM DESCRIPTION AND FLOW

The Pearl Harbor water system is a community water system serving 52,326 customers with 6,210 service connections. The average daily flow is listed at 13.410 MGD (million gallons per day), although the flow varies from approximately 11 to 22 MGD.

The system provides drinking water to all of the facilities listed above, including fire protection and irrigation.

Water Source and Operations

The Pearl Harbor water system is supplied by three sources: the Waiawa Shaft (USGS No. 2258-20) at elevation 30 feet, the Red Hill Shaft (USGS No. 2254-01) at elevation 105 feet, and the Halawa Shaft (USGS No. 2252-32) at elevation 28 feet. At the present time, the Halawa Shaft is inactive and was not inspected.

The system is also connected to the Honolulu Board of Water Supply system at four locations: Manana Housing, Halawa Heights Road, Red Hill, and Puuloa Road. These connections are intended for fire protection and emergency uses.

The water at all three sources is disinfected and fluoridated before entering the distribution system. The Waiawa Shaft has three 6,000 gpm (gallons per minute) pumps and one 6,500 gpm pump. The Red Hill Shaft has four 6,500 gpm pumps. The Halawa Shaft has two 3,200 gpm pumps and one 3,500 gpm pump.

The Pearl Harbor water system is generally operated as follows:

Water source pumps at the Waiawa and Red Hill Shafts are operated automatically via SCADA controls in the Power Plant No. 2 Watch Office (Bldg 149). A total of four pumps at the two water sources are typically sequenced based on water levels in the Halawa S-1 and S-2 tanks (6.0 MG each). These tanks provide storage and fire protection for most of the Pearl Harbor water system. One of four pumps at the Waiawa Shaft normally runs continuously to provide water to the S-1 and S-2 tanks as well as into the distribution system. As demand increases and water levels at the tanks drop, a second pump will automatically activate. During high demand periods (typically during the summer months) when the tank levels decrease further, a third pump will automatically activate. The fourth pump is also activated based on water level, but rarely turns on, even during high demand periods.

The sequence of pumps 1 through 4 at Waiawa and Red Hill are typically alternated during the summer and winter seasons. During the summer periods, the following pump sequence is typically used:

- Pump No. 1 – Waiawa 1
- Pump No. 2 – Waiawa 2
- Pump No. 3 – Red Hill 1
- Pump No. 4 – Red Hill 2

During the winter months, the following pump sequence is typically used:

- Pump No. 1 – Waiawa 1
- Pump No. 2 – Red Hill 1
- Pump No. 3 – Waiawa 2
- Pump No. 4 – Red Hill 2

The Halawa Shaft is a back-up water source. Typically, the three pumps at the Halawa Shaft were run once per week to (one pump per week) to maintain operational readiness and to prevent water stagnation within the piping system. However, the Halawa Shaft has been offline since 2007 due to maintenance and repairs. The Halawa Shaft is anticipated to be operational and online again by the end of 2009.

Two booster pumps (500 gpm each) at the Halawa Shaft pump room send water up to the three storage tanks located in Camp Smith. These tanks provide water to the Camp Smith distribution system.

Furthermore, two booster pumps (500 gpm each) at the Red Hill Shaft pump room send water up to the Red Hill tank. This tank provides water to the Red Hill Housing complex.

Fluoridation and Disinfection

At both the Waiawa Shaft and Red Hill Shaft, the water is disinfected by on-site sodium hypochlorite generation systems (ClorTec) and injector pumps. The generation units (two at each site), injector pumps, salt tanks, brine tanks, and sodium hypochlorite storage tanks are situated in secured hollow-tile buildings at both shaft locations.

The disinfection point at the Waiawa Shaft is on the 42-inch transmission line that leaves the site and flows into the distribution system, toward to the Halawa S-1 and S-2 storage tanks. Fluoridation occurs just after disinfection, on the same 42-inch line.

The disinfection point at the Red Hill Shaft is on the 30-inch transmission line that leaves the site and flows toward the Halawa S-1 and S-2 storage tanks. Fluoridation occurs just after disinfection, on the same 30-inch line.

At both shaft locations, the water is fluoridated by means of a fluoride saturator system, sodium fluoride, and injector pumps. All of these items are situated in secured areas at both sites.

SDWB was informed by the NAVFAC staff that the Halawa Shaft has an on-site sodium hypochlorite generation system for disinfection and uses sodium fluoride for fluoridation.

Storage

As stated previously, the finished water (disinfected and fluoridated) from the sources is pumped to the steel Halawa Tanks S-1 and S-2. Both tanks have a capacity of 6 MG, are approximately 40 feet high, and are situated at elevation 178.5 feet. The finished water flows out of the tanks into the distribution system via a 30-inch pipe. These two tanks provide water for most of the system.

The three storage tanks at Camp Smith are situated at elevation 850 feet. Two of the tanks (S-325 and S-326) are constructed of concrete, have a capacity of 200,000

gallons, and are approximately 16 feet high. The third tank is a glass-lined steel type (S-327), has a capacity of 250,000 gallons, and is approximately 20 feet high. The finished water flows out of the three tanks into the Camp Smith distribution system via a 10-inch pipe.

The glass-lined steel storage tank at Red Hill is located at elevation 598 feet. It has a capacity of 250,000 gallons and is approximately 30-feet high. The finished water from the tank serves the Red Hill Housing complex.

Distribution.

The Pearl Harbor distribution system serves all of the facilities and housing complexes listed on page 1. The system demand includes: residential, offices, classrooms, kitchen/cafeteria, laundry facilities, shipyard docks, light to heavy industrial activities, painting, plating areas, cleaning areas, irrigation, etc.

The distribution lines range in size from 2-inch to 42-inch pipes. The larger lines (6-inch and above) are cast iron, ductile iron, concrete, or asbestos cement pipes. The smaller service lines are copper, PVC, or galvanized iron pipes.

Distribution system pressure is targeted for 40 to 80 psi (pounds per square inch). The chlorine residual is targeted at 0.6 to 0.7 ppm (parts per million) and the fluoridation residual is targeted at 0.8 ppm as the finished water leaves the Waiawa and Red Hill Shafts.

The Manana booster pump station (approximate elevation 127 feet) raises the system pressure for the Manana Housing area. This station consists of two 225 gpm pumps and one diesel engine powered 1,500 gpm fire pump.

The Moanalua Terrace booster pump station (approximate elevation 105 feet) also raises the system pressure for the Moanalua Terrace Housing area. This station consists of two 130 gpm pumps.

Within the Camp Smith distribution system, the elevation ranges from 425 feet (Halawa Heights Road) to 850 feet (storage tanks). Therefore, there are eight pressure reducing valves (PRV) at five stations, ranging in size from 3-inch to 10-inch. The Camp Smith system is separated into three pressure zones. The upper pressure zone is controlled by the three storage tanks. The middle pressure zone is controlled by PRV stations 1, 2, and 3. The lower pressure zone is controlled by PRV stations 4 and 5.

MONITORING

Coliform Monitoring Program. There have not been any coliform bacteria detected during the past 12 months from both routine and quality assurance testing.

Lead and Copper Monitoring Program. The water system did not exceed the lead or copper action levels in 2007 and the water system is on a triennial monitoring cycle. The next monitoring will be performed in the summer of 2010.

Monitoring. The chemical monitoring program is being performed in an acceptable manner.

Phase II and Phase V Monitoring Program. The 2008-2010 compliance monitoring has not been completed. It must be completed by 12/31/10.

Water Quality. There were no violations of the microbiological monitoring requirements.

CAPACITY ASSESSMENT

This section compiles data for SDWB use.

TECHNICAL

1. OPERATOR CERTIFICATION. Each public water system (except transient, non-community) shall be under the responsible charge of an operator(s) holding a valid certification equal to or greater than the classification of the WTP or DS. Check whether the water system operators are certified.

Satisfactory. NAVFAC Hawaii has 15 grade 4 certified distribution system operators.

2. ADEQUATE WATER SOURCES. Discuss with manager whether the present water sources are adequate for the future (next 5 years).

Satisfactory.

3. POTENTIAL FOR CONTAMINATION OF THE WATER. Inspect for pathways that could contaminate the finished water at the well site, storage tanks, or distribution system.

Satisfactory.

MONITORING PROGRAMS. Check water quality monitoring performance. This evaluation is reported in the Monitoring section of the Sanitary Survey Report.

Satisfactory.

4. BACKFLOW AND CROSS-CONNECTIONS. Check whether backflow prevention devices are used if the water system serves hospitals, farms, golf courses, sewage treatment plants, or other activities that could cause a backflow of contamination into the drinking water. Look for cross-connections with the drinking water system.

Satisfactory. No cross-connections were observed during the survey.

MANAGERIAL

1. CAPITAL IMPROVEMENT PROJECTS. Identify improvements to the water system and include the month and year the improvement was installed. The facility improvements indicate management support of the water system needs. If no improvements are noted indicate whether the existing system is adequate.

Satisfactory. The system is adequate.

2. SYSTEM MAINTENANCE. The overall condition of the water system infrastructure should be assessed. Is the present maintenance level adequate for the water system?

Satisfactory. The existing facilities are well maintained.

3. EMERGENCY PLANS. Check whether the water system has an emergency plan. The plan should include obtaining backup sources of water in drought situations, loss of a well pump or extended loss of electrical power.

Satisfactory. The two sources both have four pumps so redundancy is built into the system. Back-up diesel generators and tanks are located at both sources. Back-up injector pumps are also available at both sources. There are four emergency connection points to the Honolulu BWS system. Portable diesel generators are also available.

4. CORRECTION OF PROBLEMS. The water system should have plans to correct obvious significant problems noted during the survey. The water system should also have corrected earlier identified significant problem(s) in a timely fashion.

Satisfactory. The recommendations from the 2004 sanitary survey have been addressed.

FINANCIAL

1. ADEQUATE FINANCIAL BUDGETS. Discuss whether funding levels for operation and maintenance are sufficient. Is there funding for capital improvement projects?

Satisfactory.

2. NORMAL OPERATION AND MAINTENANCE.

Satisfactory.

3. CAPITAL IMPROVEMENT PROJECTS.

Satisfactory.

SIGNIFICANT DEFICIENCIES

The recently promulgated Ground Water Rule (Rule) has a compliance date of December 1, 2009. The State intends to incorporate the requirements of the Rule into the Hawaii Administrative Rules, Title 11, Chapter 20 (HAR 11-20), Rules Relating to Potable Water Systems. The Rule will require ground water water systems with a “**significant deficiency**” to consult with the State on a corrective action plan and schedule of completion within 30 days of receiving written notice of the deficiency. The system must complete the corrective actions or be in compliance with the agreed upon corrective action plan and time schedule within 120 days of receiving written notice of the deficiency. Failure to correct the deficiency or be in compliance with a corrective action plan within 120 days of receiving written notice of the significant deficiency from the State, will subject the water system to penalties of not more than \$25,000 per violation per day under HRS 340E-8.

After the Ground Water Rule has been incorporated into HAR 11-20, the SDWB may conduct follow-up inspections to verify that the significant deficiencies have in fact been corrected.

There were no significant deficiencies noted in this sanitary survey.

RECOMMENDATIONS

1. Halawa Storage Tanks S-1 and S-2
 - a. There are some areas of light rusting on the roof, sidewalls, and around the roof access hatch for both tanks. Recommend keeping a close eye on these rust areas and repair, resurface, and repaint as required.
 - b. The SDWB was not able to inspect the overflow outlet pipes for both tanks in order to verify the condition and if the outlets had either a screen or flapper valve. Recommend providing photo evidence of the outlets and installing either a stainless steel screen or flapper valve if needed.

Kumar Bhagavan
Kumar Bhagavan P.E.

11/23/09
Date



Waiawa Shaft and Pump Station entrance gate and warning signs.



Going down the Waiawa Shaft.

Looking down the sump to the water table.



Pumps, piping, and appurtenances.



Pumps, piping, and appurtenances.



Electrical and control panels.



Sodium



ClorTec sodium hypochlorite generation system (2 units)



Sodium Hypochlorite injector pumps

Chlorine Residual Analyzer



Sodium Hypochlorite Tank

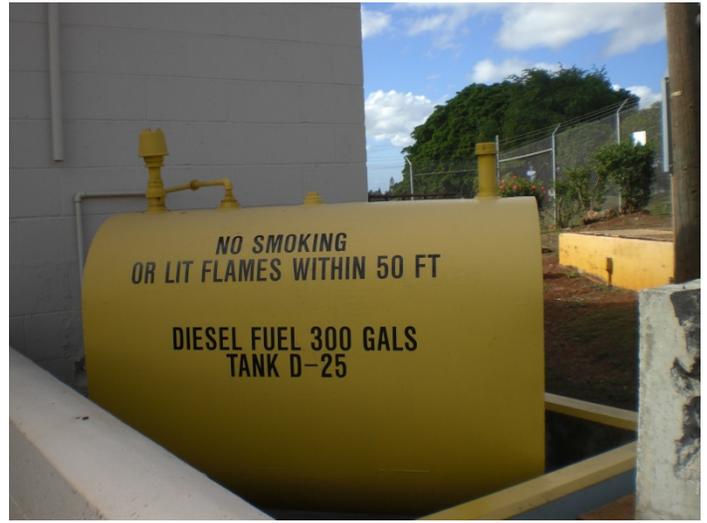
Sodium Fluoride Tanks

Fluoride injector pumps



Emergency diesel generator

5000 gallon diesel fuel tank



Left: Manana Booster Pump Station has 2 booster pumps (green) & 1 diesel pump for fire protection (yellow)
Right: 300 gallon diesel fuel tank at Manana Booster Pump Station



Storage Tank S-325, 200,000 gals, concrete, Camp Smith

Access Hatch with rubber gasket



Storage Tank S-326, 200,000 gals, concrete, Camp Smith

Access Hatch with rubber gasket



Storage Tank S-327, Camp Smith



Access Hatch with rubber gasket



Storage Tank S-327, 140,000 gallons, Glass-lined steel, Camp Smith



Camp Smith Booster Pump Station at Halawa Heights Road (for emergency BWS connection)



Halawa Storage Tank S-1, 6 MG, steel



Halawa Storage Tank S-2, 6 MG, steel



Entering the Red Hill Shaft



Red Hill Booster Pumps 1 & 2, 500 GPM each

Red Hill Pump Room – Electrical & Control Panels



Red Hill Pump Room, 4 pumps @ 6,500 GPM each



Sodium Fluoride Tanks



Fluoride injector pumps



Sodium Fluoride



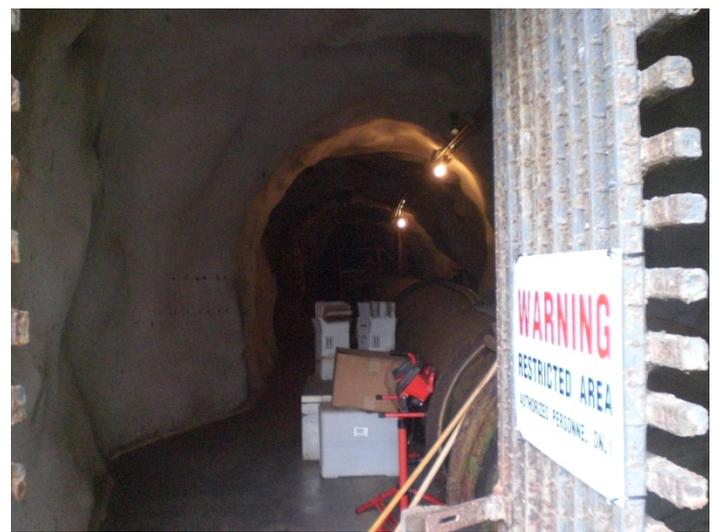
Looking down the sump to the water table



Control Panels



Left: Transmission pipe leaving Red Hill Pump Room and heading to Chlorination Building.



Right: Transmission pipe entering Chlorination Building.



Left: Red Hill Chlorination Building (near the Red Hill Pump Room).
Right: ClorTec sodium hypochlorite generation system (2 units).



Sodium



Sodium Hypochlorite Storage Tanks



Red Hill Storage Tank, 250,000 gallon, glass-lined steel





Red Hill Storage Tank, 250,000 gallon, glass-lined steel



Roof access hatch with rubber gasket



Tank roof

Overflow outlet pipe with flapper valve

**SAFE DRINKING WATER BRANCH SANITARY SURVEY FORM
PRE-INSPECTION FORM**

Survey Date: November 2, 2009

Persons Present During Sanitary Survey:

- | | |
|--|--|
| 1. <u>Kyle Teraoka - NAVFAC Hawaii</u> | 5. <u>Neal Kabei - NAVFAC Hawaii</u> |
| 2. <u>Julie Muraoka - NAVFAC Hawaii</u> | 6. <u>David Cain - NAVFAC Hawaii</u> |
| 3. <u>Lauren Arizumi - NAVFAC Hawaii</u> | 7. <u>Flynn Garcia - NAVFAC Hawaii</u> |
| 4. <u>Russell Okita - NAVFAC Hawaii</u> | 8. <u>Kumar Bhagavan - DOH-SDWB</u> |

System Information:

PWS ID No: 360 Water System Name: Pearl Harbor

Island: Oahu Classification: CWS ~~NTNCWS~~ TNCWS

Owner: NAVFAC (Naval Facilities Engineering Command) Hawaii
 Contact: Kyle Teraoka
 Phone: (808) 473-3817
 Fax: (808) 473-1545
 E-mail: kyle.teraoka@navy.mil

Population Served 52,326 Service Connections 6,210

Water source type: surface, GWUDI, groundwater, roof catchment, hauled, other

<u>Source Name</u>	<u>Type of Source</u>	<u>USGS Number</u>
<u>Waiawa Shaft</u>	<u>Groundwater</u>	<u>3-2258-10</u>
<u>Red Hill Shaft</u>	<u>Groundwater</u>	<u>3-2254-01</u>
<u>Halawa Shaft</u>	<u>Groundwater</u>	<u>3-2252-32</u>

Compliance History:

A. Microbiological & Turbidity Violations During the Past 12 Months

<u>Violation Type</u>	<u>Date</u>	<u>Result</u>	<u>Comment</u>
<u>None</u>			

B. Regulated Chemicals

<u>Redhill Shaft:</u>	<u>Nitrate</u>	<u>0.58 ppm</u>	<u>9/26/2007</u>
<u>Waiawa Shaft:</u>	<u>Nitrate</u>	<u>0.61 ppm</u>	<u>9/26/2007</u>

C. Unregulated Chemicals

--

D. Date of last sanitary survey and major findings

March 23 & April 13, 2004: Recommend reomoving rust and repainting S-1 & S-2 reservoirs. Also install rubber gaskets on access covers. Install rubber gasket on access cover for 0.25 MG tank above Coast Guard Housing. Tank 325 in Camp Smith: replace corroded screens, repair or replace rusted door, seal hole for mechanical level wire indicator opening, replace screens in the access enclosure, replace lock for access way. Tank 327 in Camp Smith: install rubber gasket for access cover, install warning sign on fenced enclosure.

--

E. Operator Certification Compliance (HAR 11-25):

<u>Name</u>	<u>Grade</u>	<u>Cert. #</u>	<u>Work Facility</u>
James Ebisu	4	D4-015	
David Cain	4	D4-005	
Flynn Garcia	4	D4-114	

System Management & Operation:

Annual Report or similar document provided? No

CCR database storage and compliance status: 2009 CCR submitted 6/19/09 & cert form 8/3/09

Is an updated Emergency Response Plan available per HAR 11-19-5 (County only)? Not Applicable

SAFE DRINKING WATER BRANCH SANITARY SURVEY FORM GROUNDWATER SOURCE PROTECTION

Source Name: Waiawa Shaft & Red Hill Shaft
 Location: Waiawa & Red Hill, Oahu, Hawaii
 USGS #: 3-2258-10 & 3-2254-01 (as applicable)
 Type: Well Tunnel Spring Shaft Other: _____
 Infrastructure immediately downstream: Light Industrial
 Source Specific Yield (ave.) 13.41 mgd gpm / cfs
 Permitted Use allocation (if applicable): Unknown mgd / gpm / cfs
 Confined / Unconfined Aquifer? Unconfined

Attach raw water quality data and sampling station location map if available

Contributing Watershed _____
 Land area in acres or sq. miles (attach exhibit if available): _____
 Estim. Land Uses or Zoning (%): _____
 (Agricultural / Conservation / Residential / Urban / Industrial / Other)
 Estimated Land Ownership (%) _____
 (Private / City / State / Federal)

Vulnerability Assessments / baseline studies conducted in the watershed? ? (Y/N)

If yes, cite the document & date: _____

Emergency Spill Response Plan available? (Y/N)

Responding Agency: _____

Potential Polluting Activities Near the Source:

1. Waiawa Industrial area
2. Halawa Industrial area
3. _____
4. _____

Potential Sources of Pollution	Minimum Horizontal Distance From Pollution Source	Estimated distance upgradient from source (feet)
Any sewer line	50 feet	<u>None</u>
Cesspool, septic tank, or subsurface sewage leaching field	1000 feet	<u>None</u>
Hazardous waste landfills, ponds, or chemical storage	1000 feet	<u>None</u>
Treated effluent injection well	1/4 mile	<u>None</u>

Is the source site in a 100-year flood plain? N (Y/N)

Protected from runoff? Y (Y/N) How? Located in underground tunnels

Source enclosed? Y (Y/N) How? Located in underground tunnels

Source site fenced? Y (Y/N)

Source site gated? Y (Y/N) Signage? Y (Y/N)

Attach maps, diagrams, sketches and plans to this field form for future reference - stamp "received Safe Drinking Water Branch" with date as applicable.

SAFE DRINKING WATER BRANCH SANITARY SURVEY FORM PUMPS, PUMP FACILITIES & CONTROLS

Source: Waiawa Shaft
 Location: Waiawa, Oahu, Hawaii
 USGS # 3-2258-10 (as applicable)
 Source type: Well GWUDI Tunnel Ditch Spring Shaft
 Infrastructure immediately downstream: Waiawa Industrial area

Pump Summary:

Pump No.	HP	Depth (ft)	Type *	Q (gpm)	TDH (ft)	Remarks**
1	450	170	s	6,000	182	
2	450	170	s	6,000	182	210 ft. TDH with 2 pumps running
3	450	170	s	6,000	182	247 ft. TDH with 3 pumps running
4		170	s	6,500	182	

* Pump types can be described as submersible vertical turbine (s) or line shaft vertical turbine (ls)

** Identify lead/lag/standby or out of service pumps, motor brand, excessive bearing leakage, motor noise, etc.

Do well and pump construction and materials appear to meet:

AWWA Standards? Unknown (Y / N / Unknown)
 County Standards? Unknown (Y / N / Unknown)
 NSF 61? Yes (Y / N / Unknown)
 State Well Construction & Pump Installation Standards? Unknown (Y / N / Unknown)

Is the pump "water-lubed"? Y (Y/N)

If not, is food grade grease or NSF 61-approved lubricating oil used to lubricate the pump?

Specify lubricant: _____

Condition of oil lube equipment: _____

Is the pump site in a 100-yr flood plain? N (Y / N / Unknown)

If "yes", does well casing extend a minimum of 2-feet above flood level? _____ (Y/N)

Is the pump site protected from runoff? Y (Y/N)

Well casing extends minimum 12 inches above well or floor slab? Y (Y/N)

Well slab/floor material and condition: Concrete, good condition

Watertight seal for:

Pump base plate/discharge head openings? Y (Y/N)

Airline tubing for water level measurements? _____ (Y/N)

Pump column vent hole/tubing? Y (Y/N)

Pump-to-waste vent elevated? NA (Y/N/NA)
 Is it screened? _____ (Y/N) All other ARVs screened? Y (Y/N/NA)
 Direction of vent? Down (up / down / sideways)
 Condition of pump-to-waste piping flapper valve? _____
 Do valve or flow tube vault walls extend above finish grade? _____ (Y / N / NA)

Note any cross connections (submerged outlets, standing water, hose bibb connections):

1. None
2. _____
3. _____

Safety cages for equipment? N (Y/N)
 Identify daily maintenance log entries: flow rate, pump hours, chlorine residual, fluoride residual, pressure
 Are the required spare parts and tool kits maintained on site? Y* (Y/N) * on base
 Chemical addition onsite? Y (Y/N)
 MSDS available onsite? Y (Y/N)
 Are inappropriate chemicals stored onsite? N (Y/N)
 If so, identify: _____

Does emergency power exist? Y (Y/N) Exercised regularly? Y (Y/N)
 Is it well protected from vandalism or the elements? Y (Y/N)

Pump Site Fenced? Y (Y/N)
 Gates Padlocked? Y (Y/N)
 Entrance Sign? Y (Y/N)

Remarks:

The Waiawa Shaft facility is in good condition.

Attach maps, diagrams, sketches and plans to this field form for future reference - stamp "received Safe Drinking Water Branch" with date as applicable.

SAFE DRINKING WATER BRANCH SANITARY SURVEY FORM

PUMPS, PUMP FACILITIES & CONTROLS

Source: Red Hill Shaft
 Location: Halawa, Oahu, Hawaii
 USGS # 3-2254-01 (as applicable)
 Source type: Well GWUDI Tunnel Ditch Spring Shaft
 Infrastructure immediately downstream: Halawa Industrial area

Pump Summary:

Pump No.	HP	Depth (ft)	Type *	Q (gpm)	TDH (ft)	Remarks**
1	400	210	s	6,500	186	
2	400	210	s	6,500	186	209 ft. TDH with 2 pumps running
3	400	210	s	6,500	186	
4	400	210	s	6,500	186	

* Pump types can be described as submersible vertical turbine (s) or line shaft vertical turbine (ls)
 ** Identify lead/lag/standby or out of service pumps, motor brand, excessive bearing leakage, motor noise, etc.

Do well and pump construction and materials appear to meet:

AWWA Standards? Unknown (Y / N / Unknown)
 County Standards? Unknown (Y / N / Unknown)
 NSF 61? Yes (Y / N / Unknown)
 State Well Construction & Pump Installation Standards? Unknown (Y / N / Unknown)

Is the pump "water-lubed"? Y (Y/N)

If not, is food grade grease or NSF 61-approved lubricating oil used to lubricate the pump?

Specify lubricant: _____

Condition of oil lube equipment: _____

Is the pump site in a 100-yr flood plain? N (Y / N / Unknown)

If "yes", does well casing extend a minimum of 2-feet above flood level? _____ (Y/N)

Is the pump site protected from runoff? Y (Y/N)

Well casing extends minimum 12 inches above well or floor slab? Y (Y/N)

Well slab/floor material and condition: Concrete, good condition

Watertight seal for:

Pump base plate/discharge head openings? Y (Y/N)

Airline tubing for water level measurements? _____ (Y/N)

Pump column vent hole/tubing? Y (Y/N)

Pump-to-waste vent elevated? NA (Y/N/NA)
 Is it screened? _____ (Y/N) All other ARVs screened? Y (Y/N/NA)
 Direction of vent? Down (up / down / sideways)
 Condition of pump-to-waste piping flapper valve? _____
 Do valve or flow tube vault walls extend above finish grade? NA (Y / N / NA)

Note any cross connections (submerged outlets, standing water, hose bibb connections):

1. None
2. _____
3. _____

Safety cages for equipment? N (Y/N)
 Identify daily maintenance log entries: flow rate, pump hours, chlorine residual, fluoride residual, pressure
 Are the required spare parts and tool kits maintained on site? Y* (Y/N) * on base
 Chemical addition onsite? Y (Y/N)
 MSDS available onsite? Y (Y/N)
 Are inappropriate chemicals stored onsite? N (Y/N)
 If so, identify: _____

Does emergency power exist? Y (Y/N) Exercised regularly? Y (Y/N)
 Is it well protected from vandalism or the elements? Y (Y/N)

Pump Site Fenced? Y (Y/N)
 Gates Padlocked? Y (Y/N)
 Entrance Sign? Y (Y/N)

Remarks:

The Red Hill Shaft facility is in good condition.

Attach maps, diagrams, sketches and plans to this field form for future reference - stamp "received Safe Drinking Water Branch" with date as applicable.

Booster Pump Stations

Manana Booster Station:

Pump No.	HP	Depth (ft)	Type *	Q (gpm)	TDH (ft)	Remarks**
1			c	225	118	
2			c	225	118	
Fire			c	1,500	118	connected to diesel engine

* Pump types can be described as centrifugal (c) or line shaft vertical turbine (ls)

** Identify lead/lag/standby or out of service pumps, motor brand, excessive bearing leakage, motor noise, etc.

Is the pump "water-lubed"? Y (Y/N)

Is the pump site protected from runoff? Y (Y/N)

Well casing extends minimum 12 inches above well or floor slab? Y (Y/N)

Well slab/floor material and condition: Concrete, good condition

Chemical addition onsite? N (Y/N)

Are inappropriate chemicals stored onsite? N (Y/N)

Does emergency power exist? Y (Y/N)

Exercised regularly? Y (Y/N)

Is it well protected from vandalism or the elements? Y (Y/N)

Pump Site Fenced? Y (Y/N)

Gates Padlocked? Y (Y/N)

Entrance Sign? Y (Y/N)

Red Hill Booster Station:

Pump No.	HP	Depth (ft)	Type *	Q (gpm)	TDH (ft)	Remarks**
1			c	500	600	
2			c	500	600	
						Located at Red Hill Shaft Water Plant

* Pump types can be described as centrifugal (c) or line shaft vertical turbine (ls)

** Identify lead/lag/standby or out of service pumps, motor brand, excessive bearing leakage, motor noise, etc.

Is the pump "water-lubed"? Y (Y/N)

Is the pump site protected from runoff? Y (Y/N)

Well casing extends minimum 12 inches above well or floor slab? Y (Y/N)

Well slab/floor material and condition: Concrete, good condition

Chemical addition onsite? Y (Y/N)

Are inappropriate chemicals stored onsite? N (Y/N)

Does emergency power exist? Y (Y/N)

Exercised regularly? Y (Y/N)

Is it well protected from vandalism or the elements? Y (Y/N)

Pump Site Fenced? Y (Y/N)

Gates Padlocked? Y (Y/N)

Entrance Sign? Y (Y/N)

Camp Smith Bldg. 680 Booster Pump for BWS connection at Halawa Heights Road

Pump No.	HP	Depth (ft)	Type *	Q (gpm)	TDH (ft)	Remarks**
1			c	480	380	For emergency BWS connection

* Pump types can be described as centrifugal (c) or line shaft vertical turbine (ls)

** Identify lead/lag/standby or out of service pumps, motor brand, excessive bearing leakage, motor noise, etc.

Is the pump "water-lubed"? Y (Y/N)

Is the pump site protected from runoff? Y (Y/N)

Well casing extends minimum 12 inches above well or floor slab? Y (Y/N)

Well slab/floor material and condition: Concrete, good condition

Chemical addition onsite? Yes^ (Y/N) ^For emergency as required.

Are inappropriate chemicals stored onsite? N (Y/N)

Does emergency power exist? Y (Y/N) Exercised regularly? Y (Y/N)

Is it well protected from vandalism or the elements? Y (Y/N)

Pump Site Fenced? Y (Y/N)

Gates Padlocked? Y (Y/N)

Entrance Sign? Y (Y/N)

Moanalua Terrace Booster Station:

Pump No.	HP	Depth (ft)	Type *	Q (gpm)	TDH (ft)	Remarks**
1			c	130	119	
2			c	130	119	

* Pump types can be described as centrifugal (c) or line shaft vertical turbine (ls)

** Identify lead/lag/standby or out of service pumps, motor brand, excessive bearing leakage, motor noise, etc.

Camp Smith Booster Station at Halawa Shaft:

Pump No.	HP	Depth (ft)	Type *	Q (gpm)	TDH (ft)	Remarks**
1			c	500	785	
2			c	500	785	

* Pump types can be described as centrifugal (c) or line shaft vertical turbine (ls)

** Identify lead/lag/standby or out of service pumps, motor brand, excessive bearing leakage, motor noise, etc.

The Camp Smith Booster Station at Halawa Shaft and the Moanalua Terrace Booster Station were not inspected.

SAFE DRINKING WATER BRANCH SANITARY SURVEY FORM
FLUORIDE TREATMENT

Location: Waiawa Shaft & Red Hill Shaft
Owner: U.S. Department of Navy

Fluoride Treatment

Feed Equipment Type? Injector Pumps
Purpose? U.S. Military facilities/residences are required to have fluoride in their drinking water.
NSF 60 chemicals used? List brand: Yes, Solvay Sodium Fluoride
Dosage? 0.8 ppm
Unit Redundancy? Yes (multiple fluoride tanks & back-up injector pumps)

Chemical handling & storage

Proper chemical handling and safety equipment available? Y (Y/N)
Were chemicals stored in a separate room? Y (Y/N)
Was adequate separation of different chemicals provided? Y (Y/N)
Were MSDS sheets available on site? Y (Y/N)

Miscellaneous

Are site boundaries appropriately fenced and gated? Y (Y/N)
Does appropriate warning or "keep out" signage exist? Y (Y/N)
Are all building doors appropriately signed (chlorine, etc.)? Y (Y/N)
Does site maintenance control vegetation & vector habitats? Y (Y/N)

Remarks:

SAFE DRINKING WATER BRANCH SANITARY SURVEY FORM DISINFECTION

Source Name: Waiawa Shaft & Red Hill Shaft
 Location: Waiawa & Halawa, Oahu, Hawaii

Disinfection Method:
 Gas Cl2 _____ **Sodium Hypochlorite** _____ Calcium Hypochlorite _____
 Chloramination _____ UV _____ Other _____

Labeled chemical manufacturer's information: ClorTec on-site Sodium Hypochlorite

Generation Systems
 Do chemicals meet NSF 60? Y* (Y/N) *Salt is NSF certified

Equipment in an enclosed structure? Y (Y/N)
 Materials of Construction: Hollow tile buildings for both sites.
 Chlorinators in a separate room? Y (Y/N)
 Warning signs on doors? Y (Y/N)
 Are light and exhaust fan switches outside of the room? NA (Y / N / NA)
 Are panic bars on an outward swinging door to outside? NA (Y / N / NA)
 Adequate floor ventilation? NA (Y / N / NA)
 Viewing window into room? NA (Y / N / NA)

Feed equipment type? Injector Pumps
 Target Residual (ppm) ? 0.6 to 0.7 ppm
 How are feed adjustments made? water quality
 Automatic switch over equipment _____
 Number of backup units 1-2 at each site
 # of days of chemical are stored? 3-6 months
 Cylinders labeled and chained? _____ (Y / N / NA)
 Protective cap on stored cylinders? _____ (Y / N / NA)
 Working scale? (type / manufacturer) _____
 Chlorine leak detectors/kits in room? _____
 Leak detection/low residual alarms? _____
 Positive pressure SCBA availability and training? _____ (Y / N / NA)
 Chemical handling clothes, safety equipment & tools? _____ (Y / N / NA)
 Critical spare parts and cylinder repair kit on hand? _____ (Y/N)

For chloramination, when is ammonia combined with chlorine? _____

For UV applications: X NA

Obtain equipment specifications: _____

Describe operation of unit(s): _____

Redundancy or contingency plans: _____

Routine maintenance: _____

Spare parts inventory: _____

Secondary disinfection residual operations: _____

Disinfectant feed point locations: Waiawa: 42" main Red Hill: 30" main

Daily log entries (feed rate, dilution ratios, dosage, residual monitoring, CT calculations, DBP formation)

 feed rate, dosage, residual, run hours, salt level (amt)

Preventative maintenance program Y (Y/N)

Auxiliary power onsite? Y (Y/N)

Emergency response plan procedures onsite? Y (Y/N)

Fire and police department coordination? Y (Y/N)

Attach maps, diagrams, sketches and plans to this field form for future reference - stamp "received Safe Drinking Water Branch" with date as applicable.

2) Halawa S-2

Site fenced? Y (Y/N) Gates padlocked? Y (Y/N)
 Warning Signs? Y (Y/N) Exposure No vandalism noted & no history of vandalism.
Located on a secure military base.

Surrounding landscaping Grass field with moderate slope.
 Cross connection potential w/ onsite irrigation system? N (Y/N)
 Site drainage OK
 Tank exterior OK but keep an eye on light rusting areas.
 Access ladder OK
 Vent screens OK
 Access MH(s) OK (with gasket) but keep an eye on light rusting areas.
 Level indicator OK
 Overflow line Need to verify condition of outlet pipe & if it has a flapper valve or stainless steel screen.
 Washout (blowoff) line _____
 Control valve vaults _____
 System pressure range 40 to 80 psi
 O&M program Yes
 Isolated through valving? Yes
 Disinfection Onsite? N (Y/N) (if yes, fill out "disinfection.xls" form)

comments: There are some areas of light rusting on the roof, sidewalls, and around the roof access manhole hatch. Recommend keeping a close eye on these rust areas and repair, resurface, and repaint as required. SDWB was not able to inspect the overflow outlet. Recommend providing photo evidence of the outlet and install a flapper valve or stainless steel screen if required.

3) S-325 (Camp Smith)

Site fenced? Y (Y/N) Gates padlocked? Y (Y/N)
 Warning Signs? Y (Y/N) Exposure No vandalism noted & no history of vandalism.
Located on a secure military base.

Surrounding landscaping Grassy area with moderate slope & fairly steep forest area
 Cross connection potential w/ onsite irrigation system? N (Y/N)
 Site drainage OK
 Tank exterior OK
 Access ladder OK
 Vent screens OK
 Access MH(s) OK with gasket.
 Level indicator OK
 Overflow line OK with flapper valve
 Washout (blowoff) line _____
 Control valve vaults _____
 System pressure range 40 to 80 psi
 O&M program Yes
 Isolated through valving? Yes
 Disinfection Onsite? N (Y/N) (if yes, fill out "disinfection.xls" form)

comments:

4) S-326 (Camp Smith)

Site fenced? Y (Y/N) Gates padlocked? Y (Y/N)
 Warning Signs? Y (Y/N) Exposure No vandalism noted & no history of vandalism.
Located on a secure military base.
 Surrounding landscaping Grassy area with moderate slope & fairly steep forest area
 Cross connection potential w/ onsite irrigation system? N (Y/N)
 Site drainage OK
 Tank exterior OK
 Access ladder OK
 Vent screens OK
 Access MH(s) OK with gasket.
 Level indicator OK
 Overflow line OK with flapper valve
 Washout (blowoff) line _____
 Control valve vaults _____
 System pressure range 40 to 80 psi
 O&M program Yes
 Isolated through valving? Yes
 Disinfection Onsite? N (Y/N) (if yes, fill out "disinfection.xls" form)

comments:

5) S-327 (Camp Smith)

Site fenced? Y (Y/N) Gates padlocked? Y (Y/N)
 Warning Signs? Y (Y/N) Exposure No vandalism noted & no history of vandalism.
Located on a secure military base.
 Surrounding landscaping Asphalt access way, grass-dirt area, and fairly steep forest area.
 Cross connection potential w/ onsite irrigation system? N (Y/N)
 Site drainage OK
 Tank exterior OK
 Access ladder OK
 Vent screens OK
 Access MH(s) OK with gasket.
 Level indicator OK
 Overflow line OK with flapper valve
 Washout (blowoff) line _____
 Control valve vaults _____
 System pressure range 40 to 80 psi
 O&M program Yes
 Isolated through valving? Yes
 Disinfection Onsite? N (Y/N) (if yes, fill out "disinfection.xls" form)

comments:

**SAFE DRINKING WATER BRANCH SANITARY SURVEY FORM
DISTRIBUTION & TRANSMISSION**

Owner: NAVFAC Hawaii
Contact: Kyle Teraoka
Phone: (808) 473-3817
Fax: (808) 473-1545
E-mail: kyle.teraoka@navy.mil

System Reference Standards: _____

Pipe materials: 6" to 42": cast iron, ductile iron, concrete or AC. 4" & smaller: copper, PVC or galv. iron
System pressure range: 40 to 80 psi
Emergency interconnections w/ other systems? Y (Y/N)
Method of isolation and security measures: Isolation valves

Installation/repair program procedures: Disinfect pipes when replacing or repairing

Flushing program & schedule: As required.

Cross connection control program: Yes. Backflow prevention devices are tested once a year at a minimum.

Corrosion control program: Not required at this time.

Leak detection control program: Unknown

Regulatory Compliance Status?

Disinfection byproducts monitoring (attach appropriate data) Y (Y/N)
Total Coliform Rule monitoring (attach appropriate data) Y (Y/N)
Lead and Copper Rule monitoring (attach appropriate data) Y (Y/N)
Surface Water Treatment Rule (SWTR, IESWTR, LT1 ESWTR) _____ (Y/N)
Other: _____

Attach maps, diagrams, sketches and plans to this field form for future reference - stamp "received Safe Drinking Water Branch" with date as applicable.