



United States Environmental Protection Agency
 Office of Enforcement and Compliance Assurance
 Office of Criminal Enforcement, Forensics and Training

National Enforcement Investigations Center

NEICVP1463E01

NEIC CIVIL INVESTIGATION REPORT
Joint Base Pearl Harbor-Hickam Public Water System
 Pearl Harbor, Hawaii 96860

Investigation Dates:

April 4-8, 2022

HANNAH BRANNING Digitally signed by
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INVESTIGATION OVERVIEW

PROJECT OBJECTIVE

U.S. Environmental Protection Agency (EPA) Region 9 (Region) requested EPA's National Enforcement Investigations Center (NEIC) to conduct a Safe Drinking Water Act (SDWA) compliance investigation of the Joint Base Pearl Harbor-Hickam (JBPHH) public water system (PWS), located at 850 Ticonderoga Street, Pearl Harbor, Hawaii 96860. The investigation assessed the JBPHH PWS's compliance with SDWA regulations found in 40 Code of Federal Regulations (CFR) Part 141.

Table 1 lists the project team members.

Table 1. PROJECT TEAM MEMBERS		
Team Member	Organization	Project Role
Hannah Branning	NEIC	Project manager
David Parker	NEIC	Field team member

FACILITY CONTACT INFORMATION

Table 2 lists the primary facility contacts.

Table 2. FACILITY CONTACT INFORMATION		
Name, Title	Phone No.	Email Address
██████████ ██████████, Joint Base Commander	██████████ ██████████	████████████████████
██████████ ██████████ Deputy Joint Base Commander	████████████████████	████████████████████
██████████ ██████████ Chief Staff Officer	██████████ ██████████	████████████████████
██████████ ██████████, Commanding Officer Naval Facilities Engineering Systems Command (NAVFAC) Hawaii	██████████ ██████████	████████████████████
██████████ ██████████ Public Works Officer NAVFAC Hawaii	██████████ ██████████	████████████████████
██████████ Utilities Director NAVFAC Hawaii	██████████ ██████████	████████████████████
██████████, Potable Water Manager NAVFAC Hawaii	████████████████████	████████████████████
██████████ ██████████, Supervisory Environmental Engineer NAVFAC Hawaii Environmental	██████████ ██████████	████████████████████
██████████, Supervisory Environmental Engineer NAVFAC Hawaii Environmental	████████████████████	████████████████████

BACKGROUND

The JBPHH PWS is a community water system (PWS identification No. HI0000360) located on a U.S. military base adjacent to Honolulu, Hawaii, serving approximately 65,000 military service men and women and their families. NAVFAC Hawaii owns and operates the JBPHH PWS while also providing other facility services on JBPHH. The Hawaii Department of Health (HDOH) administers the Public Water System Supervision Program in Hawaii and has been granted primary enforcement responsibility (i.e., primacy) for public water systems in the Hawaii.

The JBPHH PWS consists of a groundwater system with three sources, three water treatment plants, seven ground storage tanks, and approximately 250 miles of distribution pipeline. Collectively, the three water treatment plants treat an average of 12 to 22 million gallons of potable water to provide water to customers and industrial users.

According to EPA's Enforcement and Compliance History Online (ECHO), JBPHH PWS has not experienced a regulatory violation under the SDWA since January 2019. Violation data prior to January 2019 is not available in ECHO.

According to NAVFAC Hawaii staff, on May 6, 2021, a valve-opening operation was incorrectly executed during a fuel mixing operation between tank 18 and tank 20 in the Red Hill bulk fuel storage facility. A compression wave caused the end of the main fuel line to violently displace, which caused the lateral line for tank 20 to shear off, spilling an unknown amount of jet propellant-5 (JP-5) fuel. The spilled JP-5 fuel reached a sump pump for collecting aqueous firefighting foam (AFFF) and was pumped into the 14-inch overhead AFFF polyvinyl chloride (PVC) recovery pipe system.

According to the NAVFAC Hawaii "Initial Release Response Report," on November 20, 2021, a worker operating a trolley in the lower access tunnel ("Adit 3") of the Red Hill bulk fuel storage facility cracked a clean-out valve for the overhead AFFF recovery pipe, approximately 400 feet east of the Adit 3 Red Hill pumping station, spilling an estimated 9,000 gallons of JP-5 fuel and water mixture. The JP-5 fuel mixture poured onto the concrete tunnel floor to the trolley tracks and traveled approximately 750 feet over the underlying water development tunnel to a low spot in the tunnel. The JP-5 fuel mixture accumulated in a groundwater sump that prevents flooding in the access tunnel. The JP-5 fuel mixture was then transferred via a sump pump to the groundwater sump drain holding tank and a connected sump drain leach tank located outside the Adit 3 tunnel. At some point, the JP-5 fuel mixture in the Adit 3 tunnel entered a nearby Hume drain, leaching the JP-5 fuel mixture into the underlying basalt bedrock, and entered the Red Hill water development tunnel. At the time, the Navy had no knowledge of the Hume drain under the Adit 3 tunnel floor.

According to interviews with [REDACTED] NAVFAC Hawaii distribution supervisor, on November 20, 2021, at approximately 2200 (10:00 p.m.), a call was made to [REDACTED] to assist the Red Hill bulk fuel storage facility personnel with hoses to pump out the JP-5 fuel mixture that had pooled around the groundwater sump pit. [REDACTED] was not told that the spill was JP-5 fuel, and he entered the Adit 3 tunnel without any respiratory protection. [REDACTED] reported a strong fuel smell and noticed a liquid mixture that had travelled down the tunnel floor past the entrance to the Red Hill pump station and into the groundwater sump pit. At approximately 2130 (9:30 p.m.), the JBPHH PWS water production logs show a call was made from the command duty officer (CDO) to a JBPHH PWS operator, [REDACTED], to check the Red Hill pump station inside the Adit 3 tunnel. [REDACTED] called another JBPHH PWS operator, [REDACTED], to take over his watch so he could check the Red Hill pumps. [REDACTED] left the Waiawa pump station at 2235 (10:35 p.m.) after [REDACTED] arrival. According to an interview with [REDACTED], he arrived at the Red Hill bulk fuel storage facility at approximately 2300 (11:00 p.m.) and noticed a group of people standing outside the entrance to the Adit 3 tunnel. [REDACTED] was not told there was a JP-5 fuel spill and entered Adit 3 with no respiratory protection. [REDACTED] stated that his eyes were burning, and he had to pull his shirt over his mouth and nose because of the strong fuel smell so he could breathe. [REDACTED] also stated that JBPHH PWS operators have never been called to check the wells when spills occur at the Red Hill bulk fuel storage facility. [REDACTED] reported that the trolley tracks down the middle of the Adit 3 tunnel had a liquid mixture running down to the groundwater sump pit. [REDACTED] had to step over the mixture flow to reach the entrance to the Red Hill pump station. [REDACTED] entered the Red Hill pump station and checked on the pumps and the well and promptly left the Adit 3 tunnel. At 2310 (11:10 p.m.), [REDACTED] reported back to [REDACTED] that the liquid mixture was not coming from the Red Hill pump station.

On November 21, 2021, the Navy public affairs office issued a media release regarding the JP-5 fuel spill, stating that "personnel responded to what was initially assessed as a water leak shortly after 1700 (5:00 pm) on November 20, 2021. This pipe is not connected to the Red Hill Fuel tanks or main fuel pipelines, all of which are secure. Overnight, the release began to contain some amount of fuel which increased into Sunday (November 21, 2021) morning. Approximately 14,000 gallons of a mix of water and fuel was contained in the lower tunnel (Adit 3) and has been recovered and transferred to an above-ground storage tank as of midday Sunday. The Navy made initial notification to the Department of Health Saturday night (November 20, 2021) and is providing updates Sunday. There are no signs or indication of any releases to the environment and the drinking water remains safe to drink."

From November 20, 2021, through November 28, 2021, at 1815 (6:15 p.m.), the Red Hill pump station was operating under normal pumping conditions (utilizing pump #2), according to water

production operator logs and data from the supervisory control and data acquisition (SCADA) system.

According to interviews with the Navy's public affairs office, on November 27, 2021, at 1817 (6:17 p.m.), a JBPHH housing manager received the first customer complaint of a chemical smell in the water. By 0500 (5:00 a.m.) on November 28, 2021, JBPHH housing managers had received 42 customer complaints regarding water quality. The customer complaints were not sent to the NAVFAC Hawaii Potable Water Branch.

On November 28, 2021, at 1815 (6:15 pm), the water production operator logs show JBPHH PWS operator [REDACTED] received the order from [REDACTED] to secure (turn off) the Red Hill pumps until further notice and to utilize Aiea Halawa main pump #3 to provide additional water. At 1955 (7:55 p.m.), [REDACTED] turned on Red Hill main pump #2 to allow [REDACTED] to collect a water sample. [REDACTED] reported that the water sample smelled of fuel. At 2045 (8:45 p.m.), [REDACTED], NAVFAC Hawaii potable water commodity manager, [REDACTED] to secure Red Hill main pump #2, but [REDACTED] was unable to do so because [REDACTED] was in the process of taking a water sample. At 2120 (9:20 p.m.), [REDACTED] secured Red Hill main pump #2.

On November 29, 2021, according to data from the SCADA system, Red Hill main pump #2 was turned on from 1200 (12:00 p.m.) to 1500 (3:00 p.m.). The operator log from the day shift does not indicate why Red Hill main pump #2 was turned on. At 1530 (3:30 p.m.), [REDACTED] called to inform the operator on duty, [REDACTED], and [REDACTED], NAVFAC Hawaii utilities supervisor, that Red Hill main pump #2 must never be turned on per [REDACTED] and Mr. [REDACTED], NAVFAC Hawaii utilities director. In interviews with [REDACTED] and Mr. [REDACTED] and [REDACTED] were never told why Red Hill main pump #2 was shut down until [REDACTED] saw on the local news that night that JP-5 fuel was in the drinking water system.

According to the NAVFAC Hawaii "Initial Release Response Report," on December 2, 2021, tubing connected to a photoionization detector (PID) was lowered into the Red Hill shaft, resulting in a maximum reading of 110 parts per million by volume (ppmv) of volatile organic compounds (VOCs). A bailer sample was also collected from the Red Hill shaft, and a sheen with fuel bubbles floating on the surface was noticed, indicating fuel had reached the water development tunnel. The Navy public affairs office issued a media release on December 3, 2021, stating that petroleum products had been detected in the Red Hill well and the level of the petroleum hydrocarbons in the well was roughly 4 to 10 times below the HDOH action level.

On December 3, 2021, at 1656 (4:56 p.m.), JBPHH PWS water production operator logs show that [REDACTED] directed the operator on duty, [REDACTED], to secure the Aiea Halawa shaft

pumps. Data from the SCADA system confirms the pump was shut off on December 3, 2021. Since then, the JBPHH PWS has utilized one source, the Waiawa shaft.

On December 5, 2021, HDOH authorized Navy divers to enter the well and the water development tunnel to visually inspect for evidence of contamination.

On December 6, 2021, HDOH issued an emergency order to the Navy to suspend operations at the Red Hill bulk fuel storage facility, including fuel transfers. The order required the Navy to take immediate steps to install drinking water treatment system(s) at the Red Hill shaft to ensure distribution of drinking water that met applicable federal and state regulations and to minimize the movement of the contaminant plume(s). The Navy was also to secure a qualified, independent third party approved by HDOH to assess the operations and system integrity to safely defuel the bulk fuel storage tanks in a workplan and implementation schedule to be submitted within 30 days of the order issuance. Upon approval of the assessment, workplan and implementation schedule, the Navy was to make necessary corrective actions to address any deficiencies as expeditiously as possible.

According to the NAVFAC Hawaii "Initial Release Response Report," on or about December 10, 2021, Navy divers entered the water development tunnel and swam approximately 300 feet into the tunnel. The divers reported observing fuel dripping into the water tunnel. HDOH authorized the divers to use absorbent pads and to deploy a floating absorbent boom and skimmers to remove fuel from the surface of the water in the development tunnel and prevent it from migrating into the Red Hill pumps.

On December 17, 2021, HDOH, the Navy, Army, and EPA established an interagency drinking water system team (IDWST) to restore safe drinking water to affected JBPHH housing communities. The IDWS team (1) coordinated sampling and testing of groundwater and drinking water and monitoring and addressing community concerns at impacted homes and (2) implemented flushing activities.

According to the NAVFAC Hawaii "Initial Release Response Report," on December 17, 2021, the leach and groundwater holding tanks outside of the Adit 3 tunnel were inspected. The groundwater holding tank collects storm water discharge from the sump pump located just inside the Adit 3 tunnel. A JP-5 fuel mixture was identified after the groundwater holding tank was opened. The leach tank was found to be empty, but a strong odor of petroleum was reported. Upon closer inspection, it was found that JP-5 fuel mixture had been discharged onto the soil around the leach tank.

According to JBPHH PWS roving operator logs and JBPHH PWS staff interviews, on or about December 26, 2021, NAVFAC Hawaii operators and distribution staff completed installing a bypass line for Red Hill main pump #2.

Between January 6 and January 10, 2022, a temporary 24-inch transmission pipe was installed from the Red Hill main pump #2 through the Adit 3 access tunnel to a hybrid zeolite-granular activated carbon (GAC) treatment system located outside the tunnel.

On January 27, 2022, HDOH authorized the Navy to begin discharging treated water from the Red Hill infiltration tunnel, using the existing pump configuration that draws water from the bottom of the shaft, to remove contamination and prevent migration from the aquifer into the Halawa stream under a National Pollutant Discharge Elimination System (NPDES) general permit.

On January 29, 2022, JBPHH PWS water production and roving logs show JBPHH PWS operators assisted with the startup of Red Hill main pump #2.

On February 1, 2022, the Navy began the operation of pumping 5 million gallons per day (MGD) of contaminated water from the Red Hill shaft.

On April 1, 2022, HDOH was notified by the Navy regarding a release of approximately 30 gallons of a fuel and water mixture from a maintenance line connected to tank 15 at the Red Hill bulk fuel storage facility. The fuel and water mixture was recovered in sump #2.

FACILITY OPERATIONS SUMMARY

The JBPHH PWS has three groundwater sources and operates three water treatment plants (WTPs). The three WTPs together provide drinking water to serve more than 250 miles of pipeline in the distribution system. The JBPHH PWS sells water to the Aliamanu Military Reservation (AMR) and has emergency connections to the Honolulu Board of Water Supply (BWS).

The JBPHH PWS utilizes Maui-type wells. These wells have a sloping shaft to access an underground pumping chamber where vertical turbine pump shafts are placed in hand-dug water development tunnels. Fresh groundwater infiltrates the water development tunnels and is skimmed off the top of the aquifer to prevent the potential for saltwater intrusion (**Appendix A**).

Under normal conditions, the Waiawa shaft provides 80-85% of the total water supply for the JBPHH PWS. The shaft and development tunnel were constructed in 1949 after World War II as the JBPHH population boomed and were completed in November 1951. Groundwater is

pumped from the well via two of four vertical turbine pumps, where sodium hypochlorite (disinfection) and sodium fluoride (fluoridation) are injected before the water enters the distribution system via a 42-inch transmission line. The JBPHH PWS is permitted to pump 14.7 MGD from the Waiawa shaft but has been pumping 17-18 MGD due to demand. On February 28, 2019, the 42-inch cast-iron transmission line from the Waiawa shaft failed; a \$48.3 million construction project to replace the line with ductile iron was near completion at the time of the NEIC inspection. According to NAVFAC Hawaii and JBPHH PWS staff, funding was requested in 1992 from Congress to replace the transmission line, but funding was not approved until the transmission line failed.

The Aiea Halawa shaft and development tunnel were completed in June 1937 as a backup water source for the JBPHH PWS. In November 1944, the water development tunnel was lengthened and lowered. Under normal conditions, the three vertical turbine pumps are operated once a week (alternated) to maintain operational readiness and to prevent water stagnation. Groundwater is pumped from the well via one of three vertical turbine pumps, where sodium hypochlorite (for disinfection) and sodium fluoride (for fluoridation) are injected before the water enters the Camp Smith booster pumps. The water is then pumped into two 200,000-gallon and one 140,000-gallon Camp Smith ground storage tanks to provide water to the Marine Corps Camp H. M. Smith installation. Pumping from the Aiea Halawa shaft is limited and closely monitored for chlorides from saltwater intrusion. On December 3, 2021, the Aiea Halawa shaft pumps were secured and isolated from the JBPHH PWS due to concerns of a positive total petroleum hydrocarbons (TPH) sample in the nearby distribution system. A NAVFAC Hawaii contractor was on-site replacing the cast-iron transmission line from the Camp Smith booster pumps to the Camp Smith ground storage tanks at the time of the NEIC inspection.

The Red Hill shaft and development tunnel were completed in April 1943 inside the Red Hill bulk fuel storage facility access tunnel. Under normal conditions, the Red Hill shaft provides 15-20% of the water to JBPHH. Groundwater is pumped via one of four vertical turbine pumps, where sodium hypochlorite (disinfection) and sodium fluoride (fluoridation) are injected before the water enters the 30-inch transmission line to the distribution system, filling two 250,000-gallon Red Hill ground storage tanks and two 6-million-gallon Halawa ground storage tanks (S-1 and S-2). The Red Hill shaft pumps were secured and isolated from the JBPHH PWS on November 29, 2021, due to concerns of fuel in the distribution system.

FIELD ACTIVITIES SUMMARY

NEIC conducted the on-site inspection from April 4-8, 2022. The NEIC inspection team consisted of Hannah Branning and David Parker. Maria Alberty and Emma Young from EPA Region 9 also participated in the inspection. Melvin Tokuda, Whit Somerall, and Zhaohui Wang from HDOH

were also present during the inspection. Photographs taken by NEIC during the inspection are found in **Appendix B**. NEIC conducted an inspection of the AMR PWS on the afternoon of April 7, 2022 (report NEICVP1463E02).

On April 4, 2022, NEIC inspectors conducted an opening meeting and presented credentials to [REDACTED], JBPHH base commander, and Navy Captain [REDACTED] [REDACTED], public works officer, NAVFAC Hawaii. On April 8, 2022, NEIC inspectors conducted a closing meeting with the Navy, NAVFAC Hawaii, and HDOH representatives. Lists of the meeting attendees are found in **Appendix C**.

NEIC assessed the JBPHH PWS's compliance with the SDWA. The assessment included detailed discussions about and field observations of the sources, treatment, distribution system, finished water storage, pumps, pumping facilities and controls, monitoring, reporting, data verification, system management and operation, and operator compliance with state requirements. The assessment also included a review of records, including system maps and schematic diagrams, monitoring records, customer complaint logs, public notifications, engineering evaluations, operator logs, standard operating procedures, emergency response plans, and risk and resilience assessments.

INVESTIGATION OBSERVATIONS

NEIC identified the following observations during the SDWA compliance inspection. NEIC field team members discussed all observations with facility representatives during the closeout meeting.

These observations are not final compliance determinations. EPA Region 9 will make the final compliance determinations based on its review of this report and other technical, regulatory, and facility information.

Observation 1
Observation Summary: NEIC inspectors observed that the JBPHH PWS currently has only one water source due to contamination from the November 20, 2021, JP-5 fuel spill.
Citation: <i>Title 11 Chapter 20 Hawaii Administrative Rules Section 29.5 (§11-20-29.5) Capacity demonstration and evaluation (b) A public water system with adequate technical capacity has at least the following items: (2) Adequate water source(s), including: (A) Sufficient water available to serve all customers or water users based on the public water system's average daily and peak water usage, and the system's treated water output; (B) Sufficient water resources for the future, based on the maximum flow or pumping capacity of each source and a five year or more projected growth rate study which shall be submitted; (C) Adequate protection of water source(s) or watershed(s), based on the identification of existing and potential contamination hazards as required under the source water protection program and a description of how a protective area will be maintained around the source(s) or the watershed(s); and (D) Contracts or agreements to obtain water when the water source(s) are not owned by the public water system, and contracts or agreements for supplementary water sources for systems affected by drought. The contracts and agreements shall be identified and copies shall be provided if requested by the director (4) An adequate infrastructure replacement plan which includes estimates of the useful life and plans for the eventual replacement of the public water system's infrastructure, including: (A) Wells; (B) Pumping facilities; (C) Storage tanks; (D) Treatment facilities; and (E) Distribution system (pipes, valves, meters, etc.)</i>
Evidence: NEIC inspector observations JPBHH PWS staff interviews Appendix D – 2004 Hawaii Source Water Assessment Program Report

Observation 1

Description of Observation: At the time of the inspection, NEIC inspectors observed the JBPHH PWS using only one source for the water system due to the JP-5 fuel contamination that occurred on November 20, 2021.

The JBPHH PWS has emergency connections to BWS in several places throughout the distribution system. The JBPHH PWS did not provide a copy of the current, updated contract between BWS and the JBPHH PWS. Inspectors did review the 1994 contract between BWS and the JBPHH PWS.

Waiawa Shaft

The shaft currently provides 100% of the water for JBPHH.

The PWS is allowed to pump 14.7 MGD from the shaft but has been pumping 17-18 MGD.

Aiea Halawa Shaft

The shaft has not been in operation since December 3, 2021, due to concerns that the contamination plume could be drawn into the infiltration tunnel by continued pumping.

Red Hill Shaft

The source water assessment conducted in 2004 by HDOH calculated a total susceptibility score for the shaft as 644 (very high). Zone B, which is closest to the source, had 120 potential contaminating activity points for underground storage tanks (leaking) and 180 potential contaminating activity points for the military installation (**Appendix D**).

The November 20, 2021, JP-5 fuel spill and subsequent cross connection of a subsurface Hume drain contaminated the shaft.

The shaft has been isolated from the JBPHH PWS since November 29, 2021.

Observation 2

Observation Summary: NEIC inspectors observed rusted pump shafts, rusted pipes, and visible sheen in the infiltration tunnels.

Citation:

Title 11 Chapter 20 Hawaii Administrative Rules Section 29.5 (§11-20-29.5)

Capacity demonstration and evaluation

(b) A public water system with adequate technical capacity has at least the following items:

(2) Adequate water source(s), including:

(A) Sufficient water available to serve all customers or water users based on the public water system's average daily and peak water usage, and the system's treated water output;

(B) Sufficient water resources for the future, based on the maximum flow or pumping capacity of each source and a five year or more projected growth rate study which shall be submitted;

(C) Adequate protection of water source(s) or watershed(s), based on the identification of existing and potential contamination hazards as required under the source water protection program and a description of how a

Observation 2

protective area will be maintained around the source(s) or the watershed(s); and
(D) Contracts or agreements to obtain water when the water source(s) are not owned by the public water system, and contracts or agreements for supplementary water sources for systems affected by drought. The contracts and agreements shall be identified and copies shall be provided if requested by the director

(4) An adequate infrastructure replacement plan which includes estimates of the useful life and plans for the eventual replacement of the public water system's infrastructure, including:

- (A) Wells;*
- (B) Pumping facilities;*
- (C) Storage tanks;*
- (D) Treatment facilities; and*
- (E) Distribution system (pipes, valves, meters, etc.)*

Evidence:

NEIC inspector observations

JPBHH PWS staff interviews

Appendix B – NEIC Inspection Photographs

Appendix D – 2004 Hawaii Source Water Assessment Program Report

Description of Observation:Waiawa Shaft

The pump shaft that descends into the infiltration tunnel was rusted (**Appendix B** – Photo P4040001.JPG).

Aiea Halawa Shaft

NEIC inspectors observed a rusted pipe lying at the bottom of the infiltration tunnel (**Appendix B** – Photo P4050014.JPG).

Red Hill Shaft

NEIC inspectors observed a visible sheen on the surface of the infiltration tunnel and noted a fuel-like smell emanating from the shaft (**Appendix B** – Photo P4050038.JPG).

Observation 3

Observation Summary: A majority of the pumps are original to the water system. NEIC inspectors observed instances of exposed wiring, rusting, flaking paint, leaking oil, and abandoned pumps. The JBPHH PWS does not have a preventative maintenance program, an operator safety training program, or standard operating procedures for operators.

Citation:

Title 11 Chapter 20 Hawaii Administrative Rules Section 29.5 (§11-20-29.5)

Capacity demonstration and evaluation

(b) A public water system with adequate technical capacity has at least the following items:

Observation 3

(3) Adequate technical performance, shown by the water system's actual or planned compliance with national and state primary drinking water regulations and any permit requirement;

(4) An adequate infrastructure replacement plan which includes estimates of the useful life and plans for the eventual replacement of the public water system's infrastructure, including:

(A) Wells;

(B) Pumping facilities;

(C) Storage tanks;

(D) Treatment facilities; and

(E) Distribution system (pipes, valves, meters, etc.);

(5) An adequate operation plan which shows that the public water system has:

(A) Established the appropriate operator certification level for the distribution and treatment systems and has hired or contracted, and designated appropriately certified primary and backup operators in sufficient numbers to operate the water system treatment and distribution systems at all necessary times;

(B) A program identifying the responsibilities, qualifications, and training requirements of the operations personnel;

(C) Adequate preventive and corrective maintenance program to identify, schedule, perform, and record inspections, repairs, and replacements in a timely manner

(c) A public water system with adequate managerial capacity has at least the following items:

(3) An adequate information management system, including:

(A) Procedures to collect, receive, and distribute necessary information quickly from and to public water system personnel, and where applicable, any contractor(s), and actual or potential users.

Evidence:

NEIC inspector observations

JPBHH PWS staff interviews

Appendix E – JBPHH PWS Asset Map

Appendix F – JBPHH PWS Schematic Diagram

Appendix B – NEIC Inspection Photographs

Description of Observation:Overall Observations

The JBPHH PWS has no preventative maintenance program, resulting in a reactionary approach to maintenance.

The JBPHH PWS has a standard operating procedure for monitoring and responding to chlorine and fluoride levels; however, the procedure does not give operators specific instructions on replenishing chlorine and fluoride. JBPHH PWS operators stated that supervisors give verbal instructions on when and how to replenish chlorine and fluoride.

Observation 3

The JBPHH PWS has no standard operating procedures for operator and distribution crew responsibilities.

Operators and NAVFAC staff were unable to demonstrate a general understanding of the water system and how to apply SDWA and HDOH regulations.

NAVFAC staff provided a water system map to inspectors on Monday, April 4, 2022, showing water system assets (**Appendix E**). A schematic diagram was provided to inspectors late on Thursday evening, April 7, 2022 (**Appendix F**). Inspectors were able to review the schematic map of water system assets on Friday morning, April 8, 2022, and noticed that the Moanalua booster pump station had not been discussed during the week of the inspection. Inspectors observed inconsistencies in the two maps that were presented by NAVFAC. NAVFAC staff stated that it did not occur to them that inspectors needed to visit the Moanalua booster pump station, even though it was in use at the time of the inspection. Inspectors visited the Moanalua booster pump station on Friday morning, April 8, 2022.

Inspectors discovered, after reviewing system files, that the Boneyard booster pump station connected to the system was not documented on the water system assets map or the schematic map of water system assets provided to inspectors. JBPHH PWS staff stated they do not routinely visit the Boneyard booster pump station.

The JBPHH PWS does not have an operator safety and training program. The two JBPHH PWS operators who responded to the JP-5 fuel spill on November 20, 2021, were not told that JP-5 fuel had spilled in the Adit 3 tunnel and did not wear respiratory protection before entering.

Waiawa Shaft Pumps

NEIC inspectors observed no labeling of pipes indicating contents, direction of flow, or chemical injection points.

NEIC inspectors found a red metal can that contained oily, used rags near a high-voltage area (**Appendix B – Photo P4040007.JPG**).

Waiawa pump #3 was pulled and replaced with pump #4 due to mechanical issues (**Appendix B – Photo P4040002.JPG**).

NEIC inspectors observed exposed wiring on Waiawa pump #2 (**Appendix B – Photo P4040003.JPG**).

NEIC inspectors observed rusting and flaking paint on Waiawa pump #2 and walls in the shaft (**Appendix B – Photo P4040004.JPG and Photo 4040005.JPG**).

NEIC inspectors observed significant rust and pitting on piping.

Aiea Halawa Shaft Pumps

NEIC inspectors observed no labeling of pipes indicating contents, direction of flow, or chemical injection points.

NEIC inspectors observed a green garden hose connected to the air relief valve, with the end lying on the floor on pumps #1 and #3, potentially creating a cross connection (**Appendix B – Photo P4050015.JPG**).

NEIC inspectors observed that pump #2 had been removed, and JBPHH staff stated that pump #3 does not work.

NEIC inspectors observed significant rust and pitting on piping.

Red Hill Shaft Pumps

NEIC inspectors observed no labeling of pipes indicating contents, direction of flow, or chemical injection points (**Appendix B – Photo P4050039.JPG**).

The 36-inch distribution line from the Red Hill pumps in the Pearl Harbor tunnel of the Red Hill bulk fuel storage facility was not labeled as potable water or with its direction of flow. Two other large black pipes carrying JP-5 were observed to be directly across the tunnel from the potable water transmission line (**Appendix B – Photo P4050042.JPG**).

NEIC inspectors observed an actively leaking and severely corroded gate valve on the pipe to the Red Hill tanks (**Appendix B – Photo P4050044.JPG**).

Booster pump #2 had a yellow service record tag that showed the last yearly service was conducted in June 2017. JBPHH PWS operators stated that the yellow service tag system is no longer used to track when pumps are serviced (**Appendix B – Photo P4050040.JPG**).

NEIC inspectors observed that booster pump #1 was missing the elbow piping on the air relief valve, and water was collecting in the air relief valve upper housing (**Appendix B – Photo P4050041.JPG**).

Camp Smith Booster Pumps

NEIC inspectors observed no labeling of pipes indicating contents or direction of flow.

NEIC inspectors observed that booster pump #2 was leaking oil (**Appendix B – Photo P4050019.JPG**).

Booster pump #1 had a yellow service record tag that showed the last yearly service was conducted on August 9, 2017. JBPHH PWS operators stated that the yellow service tag system is no longer used to track when pumps are serviced (**Appendix B – Photo P4050020.JPG**).

NEIC inspectors observed that the booster pump #1 oil reservoir was dark, indicating service was warranted (**Appendix B – Photo P4050021.JPG**).

Observation 3

NEIC inspectors observed that the air relief valves on booster pumps #1 and #2 were not screened (**Appendix B** – Photo P4050022.JPG).

Manana Booster Pumps

NEIC inspectors observed no labeling of pipes indicating contents or direction of flow.

NEIC inspectors observed construction at the station, where only one of two booster pumps were running. According to JBPHH PWS operators, on November 16, 2021, booster pump #1 experienced a mechanical failure during which water discharged from booster pump #1 onto the motor of booster pump #2, causing the motor to fail. Both pumps were rendered inoperable, and treated water was not reaching the Manana housing area. JBPHH PWS staff requested the emergency interconnection with BWS to be opened on November 16, 2021, to allow water to reach customers in Manana housing. On December 14, 2021, booster pump #1 was repaired and brought online. JBPHH PWS staff are waiting for the new booster pump #2 to be delivered in May 2022.

Boneyard Booster Pumps

The Boneyard booster pumps are not in use, and it is unknown when they were last in service. The JBPHH PWS does not intend to use the booster pumps in the future, according to JBPHH PWS staff (**Appendix B** – Photo P4080091.JPG).

Observation 4

Observation Summary: NEIC inspectors observed instances of incorrect chemical storage, expired reagents, and unlabeled chemical feed lines.

Citation:

Title 11 Chapter 20 Hawaii Administrative Rules Section 38 (§11-20-38)

Additives

(d) The use of any chemical, material, or product in drinking water treatment or supply shall conform to the manufacturer's instructions or recommendations for use, maximum dosage, application rates, installation, restrictions, and any other conditions imposed by the product certification organization accredited by the American National Standards Institute or the director.

Evidence:

NEIC inspector observations

JPBHH PWS staff interviews

Appendix B – NEIC Inspection Photographs

Description of Observation:

Waiawa Treatment Building

NEIC inspectors observed two 330-gallon sodium hypochlorite tanks outside the treatment building, in direct sunlight (**Appendix B** – Photo P4040009.JPG).

Observation 4

NEIC inspectors observed five unlabeled 10-liter containers in the treatment building. JBPHH PWS operators stated that they use the containers to carry a diluted solution of sodium hypochlorite and water while they are out in the field (**Appendix B** – Photo P4040008.JPG).

Two tanks of sodium fluoride were unlabeled (**Appendix B** – Photo P4040010.JPG).

Chemical feed lines for fluoride and sodium hypochlorite behind the treatment building were not labeled (**Appendix B** – Photo P4040011.JPG).

Aiea Halawa Treatment Building

NEIC inspectors observed one 330-gallon sodium hypochlorite tank outside the treatment building, in direct sunlight (**Appendix B** – Photo P4050016.JPG). JBPHH PWS operators stated the tank was delivered in November 2021 and had been sitting outside since then.

NEIC inspectors observed that the fluoride chemical addition log in the treatment building was missing the year for dates and did not indicate which operator added fluoride (**Appendix B** – Photo P4050017.JPG).

NEIC inspectors observed that two fluoride reagent bottles found in the treatment building had expired in January 2017 and October 2019 (**Appendix B** – Photo P4050018.JPG).

Red Hill Treatment Building

NEIC inspectors observed that the air relief valve on the sodium hypochlorite feed line located on the exterior of the treatment building was not screened. Inspectors observed large wasp nests on the exterior of the treatment building.

Observation 5

Observation Summary: NEIC inspectors observed numerous instances of rusting, pitting, vegetation growth, and access concerns around the finished water storage tanks.

Citation:

Title 11 Chapter 20 Hawaii Administrative Rules Section 29.5 (§11-20-29.5)

Capacity demonstration and evaluation

(a) To demonstrate adequate capacity, the proposed or existing supplier of water shall submit to the director, written information sufficient to show that the requirements in subsections (b) through (d) are met.

(b) A public water system with adequate technical capacity has at least the following items:

(4) An adequate infrastructure replacement plan which includes estimates of the useful life and plans for the eventual replacement of the public water system's infrastructure, including:

(A) Wells;

(B) Pumping facilities;

(C) Storage tanks;

(D) Treatment facilities; and

(E) Distribution system (pipes, valves, meters, etc.);

(5) An adequate operation plan which shows that the public water system has:

Observation 5

(A) Established the appropriate operator certification level for the distribution and treatment systems and has hired or contracted, and designated appropriately certified primary and backup operators in sufficient numbers to operate the water system treatment and distribution systems at all necessary times;

(B) A program identifying the responsibilities, qualifications, and training requirements of the operations personnel;

(C) Adequate preventive and corrective maintenance program to identify, schedule, perform, and record inspections, repairs, and replacements in a timely manner.

Evidence:

NEIC inspector observations

JPBHH PWS staff interviews

Appendix B – NEIC Inspection Photographs

Appendix G – 2009 HDOH Sanitary Survey Report

Appendix H – 2014 HDOH Sanitary Survey Report

Appendix I – 2017 HDOH Sanitary Survey Report

Appendix J – 2020 S-1 Tank Inspection Report

Appendix K – 2020 S-2 Tank Inspection Report

Description of Observation:Camp Smith Tanks

Tanks S-325, S-326, and 684 (S-327) are owned and operated by NAVFAC Hawaii and provide water to the Marine Corps Camp H. M. Smith installation. The tanks are located on the Camp Smith installation, and JBPHH PWS operators do not have direct access to the tanks. Operators must rely on the Marine Corps to gain access to the tanks.

Tank S-325

The tank overflow pipe terminates into a pit overgrown with vegetation (**Appendix B** – Photo P4050023.JPG).

NEIC inspectors observed heavy vegetation growing around the base of the tank (**Appendix B** – Photo P4050024.JPG) and pockets of moisture bubbling under the paint on the exterior tank wall. JBPHH PWS operator [REDACTED] tested the moisture pocket for chlorine with his field test kit. The water sample turned light pink, indicating the water contained chlorine and the tank could be leaking. On May 2, 2022, EPA Region 9 notified NEIC inspectors that the heavy vegetation around the tank was removed by NAVFAC Hawaii on April 15, 2022.

NEIC inspectors observed a ladder leaning against the tank at the base of the tank roof access ladder (**Appendix B** – Photo P4050026.JPG). JBPHH PWS operators stated they did not place the ladder.

JBPHH PWS operators did not know the last time the tank had been cleaned and inspected but guessed that it had been at least 9 years ago.

Tank S-326

The tank overflow pipe flapper did not seat (seal) the overflow pipe (**Appendix B** – Photo P4050025.JPG).

NEIC inspectors observed a ladder leaning against the tank at the base of the tank roof access ladder and an additional ladder near the tank (**Appendix B** – Photo P4050026.JPG). JBPHH PWS operators stated they did not place the ladders.

NEIC inspectors observed pockets of moisture bubbling under the paint on the exterior tank wall (**Appendix B** – Photo P4050028.JPG). [REDACTED] tested the moisture pocket for chlorine with his field test kit. The water sample did not turn pink, indicating the moisture pocket might not be a leak from the tank.

JBPHH PWS operators did not know the last time the tank had been cleaned and inspected but guessed that it had been at least 9 years ago.

Tank 684 (referred to as tank S-327 in the HDOH April 2017 sanitary survey)

NEIC inspectors observed vegetation growing on the roof of the tank (**Appendix B** – Photo P4050029.JPG and Photo P4050031.JPG). On May 2, 2022, EPA Region 9 notified NEIC inspectors that the heavy vegetation around the tank was removed by NAVFAC Hawaii on April 15, 2022.

NEIC inspectors observed that the asphalt apron around the foundation of the tank was cracked and experiencing upheaval from the penetrating roots of nearby ironwood trees (**Appendix B** – Photo P4050030.JPG).

NEIC inspectors observed vegetation growing around the base of the tank (**Appendix B** – Photo P4050032.JPG).

NEIC inspectors observed cracking in the caulk on the seams of the tank (**Appendix B** – Photo P4050033.JPG).

Halawa Tanks

Tanks S-1 and S-2 are owned and operated by NAVFAC Hawaii. The tanks provide water to the JBPHH PWS and the AMR PWS.

Tank S-1

NEIC inspectors observed areas of rust and pitting on the exterior of tank had and observed evidence of rust repairs in some areas (**Appendix B** – Photo P4060054.JPG). This observation was noted in the 2009 and 2014 HDOH sanitary surveys (**Appendices G** and **H**). This observation was also noted in the 2020 tank inspection report (**Appendix J**).

The supports for the AMR GAC system piping are resting on the edge of the tank foundation (**Appendix B** – Photo P4060055.JPG). On May 2, 2022, HDOH notified NEIC inspectors that the supports had been removed from the tank foundation.

Observation 5

The tank roof access hatch was not sealed, allowing geckos (a species of reptile) to nest inside the tank (**Appendix B** – Photo P4060057.JPG). This observation was noted as a significant deficiency in the 2014 HDOH sanitary survey (**Appendix H**). On May 2, 2022, EPA Region 9 notified NEIC inspectors that NAVFAC Hawaii had replaced the tank roof hatch seal and removed the geckos.

NEIC inspectors observed that the interior of the tank was rusting and pitting (**Appendix B** – Photo P4060058.JPG).

NEIC inspectors observed that the tank roof was warped due to numerous patches that had been made to the seams and observed areas of rust and corrosion (**Appendix B** – Photo P4060059.JPG). This observation was also noted in the 2020 tank inspection report (**Appendix J**).

NEIC inspectors observed a large dent near the top of the tank, above the roof access stairs (**Appendix B** – Photo P4060060.JPG).

NEIC inspectors observed that the pit that contains the fill line for tanks S-1 and S-2 was overgrown with vegetation (**Appendix B** – Photo P4060056.JPG). This observation was noted in the 2017 HDOH sanitary survey (**Appendix I**).

Tank S-2

The tank was isolated from the system in December 2021 for unknown reasons.

The tank access hatch hinge was severely corroded, and metal was flaking off (**Appendix B** – Photo P4060048.JPG).

The tank roof access hatch was not sealed and was too large for the base, allowing geckos to nest inside the tank (**Appendix B** – Photo P4060049.JPG). NEIC inspectors observed that paint was peeling and falling into the tank. On May 2, 2022, EPA Region 9 notified NEIC inspectors that NAVFAC Hawaii had replaced the tank roof hatch seal and removed the geckos.

NEIC inspectors observed areas of severe rust and pitting on the tank exterior. This observation was noted in the 2009 and 2014 HDOH sanitary surveys (**Appendices G and H**).

NEIC inspectors observed areas of rust and pitting on the tank roof (**Appendix B** – Photo P4060050.JPG). This finding was noted in the 2009, 2014, and 2017 HDOH sanitary surveys (**Appendices G, H, and I**). This observation was noted in the 2020 tank inspection report (**Appendix K**).

The center tank roof support was severely corroded (**Appendix B** – Photo P4060051.JPG). This observation was noted in the 2009 and 2014 HDOH sanitary surveys (**Appendices G and H**).

Observation 5

NEIC inspectors observed vegetation growing between the base of the tank and the foundation (**Appendix B** – Photo P4060061.JPG). This observation was noted in the 2020 tank inspection report (**Appendix K**).

NEIC inspectors observed that the sidewall of the tank was bulging (**Appendix B** – Photo P4060062.JPG and Photo P4060063.JPG).

Red Hill Tanks

The tanks are owned and operated by NAVFAC Hawaii and provide water to the AMR PWS and fire protection to the Red Hill bulk fuel storage facility.

NEIC inspectors observed numerous instances of large gaps in the perimeter fencing around the tanks (**Appendix B** – Photo P4060065.JPG and Photo P4060071.JPG).

Upper tank

NEIC inspectors observed moss growing between the tank and the foundation (**Appendix B** – Photo P4060064.JPG).

NEIC inspectors observed that the roof hatch gasket was loose and did not seal.

Lower tank

NEIC inspectors observed that the bolts on the side wall of the tank were rusting (**Appendix B** – Photo P4060066.JPG).

NEIC inspectors observed a significant amount of sediment in the bottom of the tank (**Appendix B** – Photo P4060067.JPG). According to JBPHH PWS staff, the tank was installed in the mid-1990s and has never been cleaned.

NEIC inspectors observed that the tank overflow flapper pin was corroded and unable to open or close without force and seat on the overflow pipe (**Appendix B** – Photo P4060069.JPG and Photo P4060070.JPG).

NEIC inspectors observed vegetation growing under the roof access stairs between the tank and the foundation (**Appendix B** – Photo P4060072.JPG and Photo P4060073.JPG).

Observation 6

Observation Summary: The JBPHH PWS could not produce a written valve exercise program, flushing plan, cross connection control program, leak detection plan, or preventative maintenance plan, and did not understand the age of the water in the system.

Citation:

Title 11 Chapter 20 Hawaii Administrative Rules Section 29.5 (§11-20-29.5)

Capacity demonstration and evaluation

(b) A public water system with adequate technical capacity has at least the following items:

- (4) An adequate infrastructure replacement plan which includes estimates of the useful life and plans for the eventual replacement of the public water system's infrastructure, including:*

Observation 6

- (A) Wells;
 - (B) Pumping facilities;
 - (C) Storage tanks;
 - (D) Treatment facilities; and
 - (E) Distribution system (pipes, valves, meters, etc.);
- (5) An adequate operation plan which shows that the public water system has:
- (C) Adequate preventive and corrective maintenance program to identify, schedule, perform, and record inspections, repairs, and replacements in a timely manner.
- (7) A cross connection and backflow prevention program to ensure that there is an accurate inventory of backflow prevention devices throughout the public water system, and that devices are regularly tested and maintained

Evidence:

NEIC inspector observations
JPBHH PWS staff interviews

Description of Observation:Valve Exercise Program

According to Jonathan "Jon" Navor, a distribution system pipefitter, the JBPWH PWS exercises valves every other year and hydrants every year. Another JBPWH PWS staff member said the facility did not have a valve exercise program because of the concern the valves would break. The JBPWH PWS did not provide a written valve exercise program.

Flushing Plan

According to [REDACTED], [REDACTED] water production team conducts regular flushing. The JBPWH PWS did not provide a written flushing plan.

Cross Connection Control Program

According to [REDACTED], the JBPWH PWS has no written cross connection control program. JBPWH PWS staff stated they are working with a contractor to create a program following the November 2021 cross connection of a Hume drain in the Red Hill bulk fuel storage facility that contaminated the Red Hill shaft.

Leak Detection Program

The JBPWH PWS does not have a formal leak detection program.

Water Age

The JBPWH PWS staff did not know the age of the water in system, meaning they did not know how long water takes to get through the distribution system, including storage time. JBPWH PWS staff stated that a contractor would be performing a fluoride tracer study the week of April 11, 2022, and the study report would be provided to the inspection team. To date, the inspection team has not received the report.

Preventative Maintenance Plan

Observation 6

According to [REDACTED], there is a preventative maintenance plan for the distribution system. The JBPHH PWS did not provide a written preventative maintenance plan.

Observation 7

Observation Summary: JBPHH PWS did not issue a Tier 1 public notification to customers or the AMR PWS within 24 hours of confirming the Red Hill Shaft had been contaminated with JP-5 fuel.

Citation:

Title 40 – Protection of the Environment Code of Federal Regulations (40 CFR) Chapter I – Environmental Protection Agency Subchapter D – Water Programs Part 141 – National Primary Drinking Water Regulations Subpart Q – Public Notification of Drinking Water Violations

40 CFR §141.201 General public notification requirements.

(a) Who must give public notice? Each owner or operator of a public water system (community water systems, non-transient non-community water systems, and transient non-community water systems) must give notice for all violations of national primary drinking water regulations (NPDWR) and for other situations, as listed in Table 1. The term “NPDWR violations” is used in this subpart to include violations of the maximum contaminant level (MCL), maximum residual disinfection level (MRDL), treatment technique (TT), monitoring requirements, and testing procedures in this part 141. Appendix A to this subpart identifies the tier assignment for each specific violation or situation requiring a public notice.

TABLE 1 TO § 141.201—VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A PUBLIC NOTICE

(3) Special public notices:

(i) Occurrence of a waterborne disease outbreak or other waterborne emergency.

(b) What type of public notice is required for each violation or situation? Public notice requirements are divided into three tiers, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved. The public notice requirements for each violation or situation listed in Table 1 of this section are determined by the tier to which it is assigned. Table 2 of this section provides the definition of each tier. Appendix A of this part identifies the tier assignment for each specific violation or situation.

TABLE 2 TO § 141.201—DEFINITION OF PUBLIC NOTICE TIERS

(1) Tier 1 public notice—required for NPDWR violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

(c) Who must be notified?

(1) Each public water system must provide public notice to persons served by the water system, in accordance with this subpart. Public water systems that sell or otherwise provide drinking water to other public water systems (i.e., to consecutive systems) are required to give public notice to the owner or operator of the consecutive system; the consecutive system is responsible for providing public notice to the persons it serves.

(3) A copy of the notice must also be sent to the primacy agency, in accordance with the requirements under §141.31(d).

Observation 7

40 CFR §141.202 Tier 1 Public Notice – Form, manner, and frequency of notice.

(a) Which violations or situations require a Tier 1 public notice? Table 1 of this section lists the violation categories and other situations requiring a Tier 1 public notice. Appendix A to this subpart identifies the tier assignment for each specific violation or situation.

TABLE 1 TO § 141.202—VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A TIER 1 PUBLIC NOTICE

(7) Occurrence of a waterborne disease outbreak, as defined in § 141.2, or other waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination)

(9) Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the primacy agency either in its regulations or on a case-by-case basis.

(b) When is the Tier 1 public notice to be provided? What additional steps are required? Public water systems must:

(1) Provide a public notice as soon as practical but no later than 24 hours after the system learns of the violation;

(2) Initiate consultation with the primacy agency as soon as practical, but no later than 24 hours after the public water system learns of the violation or situation, to determine additional public notice requirements; and

(3) Comply with any additional public notification requirements (including any repeat notices or direction on the duration of the posted notices) that are established as a result of the consultation with the primacy agency. Such requirements may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served.

(c) What is the form and manner of the public notice? Public water systems must provide the notice within 24 hours in a form and manner reasonably calculated to reach all persons served. The form and manner used by the public water system are to fit the specific situation, but must be designed to reach residential, transient, and non-transient users of the water system. In order to reach all persons served, water systems are to use, at a minimum, one or more of the following forms of delivery:

(1) Appropriate broadcast media (such as radio and television);

(2) Posting of the notice in conspicuous locations throughout the area served by the water system;

(3) Hand delivery of the notice to persons served by the water system; or

(4) Another delivery method approved in writing by the primacy agency.

40 CFR §141.205 Contents of the public notice.

(a) What elements must be included in the public notice for violations of National Primary Drinking Water Regulations (NPDWR) or other situations requiring a public notice? When a public water system violates a NPDWR or has a situation requiring public notification, each public notice must include the following elements:

(1) A description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);

Observation 7

- (2) When the violation or situation occurred;
- (3) Any potential adverse health effects from the violation or situation, including the standard language under paragraph (d)(1) or (d)(2) of this section, whichever is applicable;
- (4) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;
- (5) Whether alternative water supplies should be used;
- (6) What actions consumers should take, including when they should seek medical help, if known;
- (7) What the system is doing to correct the violation or situation;
- (8) When the water system expects to return to compliance or resolve the situation;
- (9) The name, business address, and phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and
- (10) A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under paragraph (d)(3) of this section, where applicable.

(c) How is the public notice to be presented?

- (1) Each public notice required by this section:
 - (i) Must be displayed in a conspicuous way when printed or posted;
 - (ii) Must not contain overly technical language or very small print;
 - (iii) Must not be formatted in a way that defeats the purpose of the notice;
 - (iv) Must not contain language which nullifies the purpose of the notice.

Title 11 Chapter 20 Hawaii Administrative Rules Section 29.5 (§11-20-29.5)

Capacity demonstration and evaluation

(c) A public water system with adequate managerial capacity has at least the following items:

- (6) Adequate internal policies, including:
 - (A) A policy to inform customers or water users adequately about water quality as necessary, the public water system's operation as it may affect them, and the customers' or water users' duties, including any need for disinfection or alternate sources, cooperation with public water system personnel during service interruptions or emergencies, compliance with rules, help with water quality monitoring, water conservation, cross connection and backflow prevention, infrastructure changes, meter reading, rates, payment, and complaints;

Evidence:

NEIC inspector observations
JPBHH PWS staff interviews

Appendix L – Navy Public Affairs Office Media Releases

Description of Observation: The JPBHH PWS did not issue a Tier 1 public notification to customers or the AMR PWS within 24 hours of JP-5 fuel contaminating the Red Hill shaft and entering the system on December 2, 2021. The Navy's public affairs office issued a media release dated December 2, 2021, to notify the public that petroleum products had been detected in the Red Hill well and that the levels were well below HDOH's environmental action level (**Appendix L**).

Observation 7

Customer complaints regarding water quality or other water issues are routed through housing managers (military or private contractors who oversee base housing) and are not sent to JBPHH PWS staff to address. At the time of the inspection, NAVFAC and the JBPHH PWS did not provide a customer complaint process or a list of customer complaints beginning in 2020. On May 9, 2022, EPA Region 9 provided NEIC inspectors a NAVFAC Hawaii-created list of customer complaints from January 2020 to February 2022.

Observation 8

Observation Summary: JBPHH PWS currently has only five certified water production operators who oversee four of the Navy's PWSs. The JBPHH PWS currently does not have standard operating procedures for operator duties.

Citation:

Title 11 Chapter 25 Hawaii Administrative Rules Section 2.50 (§11-25-2.50)

Public water system operation and management

(a) This chapter applies to all community and non-transient noncommunity public water systems.

(1) Each public water system covered by this chapter shall be under the responsible charge of an operator(s) holding a valid certification equal to or greater than the classification of the water treatment plant (WTP) or distribution system (DS);

(2) All operating personnel making daily process control or system integrity decisions about water quality or quantity that affect public health shall be certified; and

(3) A designated certified operator shall be available for each operating shift.

(b) This chapter applies to all WTPs in community and non-transient noncommunity public water systems and all WTPs serving surface water or ground water under the direct influence of surface water. All WTPs covered by this chapter shall be operated by certified WTP operators. Each WTP shall at all times be under the responsible charge of an operator holding a valid certification equal to or greater than the WTP classification.

(c) All fluoridation facilities shall be operated by certified operators who have received board-approved fluoridation training.

(d) Each DS shall at all times be under the responsible charge of an operator holding a valid certification equal to or greater than the DS classification.

Evidence:

NEIC inspector observations

JPBHH PWS staff interviews

Appendix M – JBPHH PWS Production Operator Logs

Appendix N – JBPHH PWS Roving Operator Logs

Description of Observation: According to JBPHH PWS staff, only five certified water production operators and two supervisors cover the Navy's four PWSs. Three operators cover the day shift, one operator covers the swing shift, and one operator covers the night shift. JBPHH PWS staff stated that in early 2021, the system was short two certified operators. The JBPHH PWS did not provide a current list of certified water production operators and their certification levels.

At the time of the inspection, water production operators were using one main log-in for the SCADA system.

Observation 8

NEIC inspectors observed that water production operator logs were filled out inconsistently and were missing information. JBPHH PWS staff stated there is no standard operating procedure that stipulates what information the production operator logs must include.

NAVFAC Hawaii owns and operates three additional PWSs. Data for all four PWSs are being reported together in the production operator logs and the roving operator daily logs (**Appendices M and N**).

From November 17, 2021, to December 30, 2021, production operator logs show a total of nine shift logs were missing due to lack of certified operator coverage (**Appendix M**):

- Day shift on November 22, 2021
- Night shift on November 24, 2021
- Swing shift on November 30, 2021
- Day shift on December 6, 2021
- Day shift on December 13, 2021
- Day shift on December 20, 2021
- Day shift on December 21, 2021
- Day shift on December 22, 2021
- Day shift has a gap between 0700-1100 on December 23, 2021

According to [REDACTED], the distribution system should have 19 certified operators but currently has 16 certified operators. The distribution system operators cover four of the Navy's PWSs.

Two distribution system operator's licenses expired on November 30, 2021. It is unknown if the two operators are making decisions regarding water quantity and quality.

Observation 9

Observation Summary: NEIC inspectors observed internal and external communication and funding issues with the JBPHH PWS.

Citation:

Title 11 Chapter 20 Hawaii Administrative Rules Section 29.5 (§11-20-29.5)

Capacity demonstration and evaluation

(c) A public water system with adequate managerial capacity has at least the following items:

(1) Clear organizational structure and communications, including:

(B) A chart showing the organizational structure, the working relationships between personnel, and a summary of the primary duties and responsibilities of personnel;

(d) A public water system with adequate financial capacity has at least the following items:

(1) An adequate budget, including:

(A) Annual budgets that are prepared and approved by the water system owner(s) or its duly authorized representative for water system operation. A description of the budgeting process and copies of proposed and, if applicable, actual budgets, shall be provided; and

(B) Income and cash reserves adequate to pay annual operating expenses,

Observation 9

unexpected significant repairs, and planned major work. Dedicated source(s) of income shall be identified;

(2) Adequate budget controls, including:

(A) Periodic performance reviews of actual expenditures and the annual budget;

(B) Procedures to safeguard financial assets; and

(C) Maintenance of detailed financial records which clearly identify the sources of income and the expenses involved in operating the public water system;

Evidence:

NEIC inspector observations

JPBHH PWS staff interviews

NAVFAC staff interviews

Description of Observation: The current JBPWH PWS organizational structure does not allow for effective communication between PWS staff, NAVFAC staff, and Navy leaders. The PWS staff, distribution staff, and compliance staff are all in separate departments and report to different supervisors.

If an additional production operator needs to be called in to respond to an emergency, the operator on duty must call the CDO to request permission to receive assistance, delaying the ability for JBPWH PWS staff to respond.

In FY2021, the JBPWH PWS transitioned from a capital fund to general fund. Under the capital fund, operators could purchase needed supplies to make repairs quickly. Under the general fund, it can take weeks to get supplies before issues can be repaired. For example, [REDACTED] [REDACTED] stated that when a line break occurred in the distribution system under the capital fund, it could be fixed in 1-2 days. Under the general fund, it takes a week or more to fix.

According to NAVFAC staff, the JBPWH annual budget is approximately \$30 million, which includes building maintenance (including repairs to heating, ventilation, and air conditioning), building projects, wastewater operations, and the operation of the PWS. Of the \$30 million, \$6 million is allocated to the JBPWH PWS but is not guaranteed.

Observation 10

Observation Summary: Inspectors reviewed JBPWH PWS's emergency response plan (ERP) and found that it did not contain the required information.

Citation:

42 United States Code (U.S.C.) 300i-2 Community water system risk and resilience

(b) Emergency response plan

Each community water system serving a population greater than 3,300 shall prepare or revise, where necessary, an emergency response plan that incorporates findings of the assessment conducted under subsection (a) for such system (and any revisions thereto). Each community water system shall certify to the Administrator, as soon as reasonably possible after October 23, 2018, but not later than 6 months after completion of the assessment under subsection (a), that the system has completed such plan. The emergency response plan shall include—

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- (1) strategies and resources to improve the resilience of the system, including the physical security and cybersecurity of the system;*
- (2) plans and procedures that can be implemented, and identification of equipment that can be utilized, in the event of a malevolent act or natural hazard that threatens the ability of the community water system to deliver safe drinking water;*
- (3) actions, procedures, and equipment which can obviate or significantly lessen the impact of a malevolent act or natural hazard on the public health and the safety and supply of drinking water provided to communities and individuals, including the development of alternative source water options, relocation of water intakes, and construction of flood protection barriers; and*
- (4) strategies that can be used to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the system.*

(c) Coordination Community water systems shall, to the extent possible, coordinate with existing local emergency planning committees established pursuant to the Emergency Planning and Community Right-To-Know Act of 1986 (42 U.S.C. 11001 et seq.) when preparing or revising an assessment or emergency response plan under this section.

Evidence:

NEIC inspector observations
JPBHH PWS staff interviews
NAVFAC staff interviews

Description of Observation: According to EPA's America's Water Infrastructure Act (AWIA) Section 2013 compliance data, the JPBHH PWS certified completion of the ERP by the June 30, 2021, certification deadline.

NEIC inspectors observed the JPBHH PWS ERP was missing the following:

- Discussion of the strategies and resources to improve the resilience of the system, including the physical security and cybersecurity of the system.
- Discussion of the strategies that can be used to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the system.
- Discussion that the Navy will coordinate to the extent possible with local emergency planning committees established under the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 when preparing or revising an assessment or emergency response plan under the AWIA.
- Statement that the Navy will maintain a copy of the assessment and emergency response plan for 5 years after certifying the plan to the EPA.

NEIC inspectors observed the following inconsistencies in the ERP's purpose or when to use the plan:

- JPBHH PWS staff stated they were not aware of their responsibilities described in the ERP. JPBHH PWS staff stated the ERP applied to natural disasters or malicious acts, not to contaminants within the system.

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- The first sentence of executive summary states ERP provides guidance for minimizing damage and maintaining control of potable water at JBPHH following a natural disaster or manmade emergency.
- In some places, the ERP includes discussions that natural disasters and emergency events may cause damage to potable water through hurricanes, earthquakes, threats, or introduction of contaminants into the water system; in other areas, the ERP only refers to natural disasters and malicious acts.
- The ERP lacks a description of the response steps necessary for addressing an uncontrolled release of the Red Hill bulk fuel storage facility, a unique threat that can impact the JBPHH PWS.
- The ERP states that training will be conducted on the “contingency plans within the ERP” and that “staff should be trained on their ERP responsibilities.” JBPHH PWS staff stated they had not received training on the plans in the ERP. Additionally, the ERP states that training should be provided annually and should include testing of the response procedures outlined in the ERP. In several locations, the ERP states the plan should be tested regularly using a simulated disruption; this is also reiterated in the executive summary in an all caps “NOTE.”
- The ERP Appendix D checklist does not adequately detail the steps water operators should take, or guidance required, for inspecting system assets. For example, when the operator smelled fuel on November 20, 2021, the water operator did not inspect the Red Hill shaft and did not have training on how to use the checklist in the ERP.
- Inspectors observed inconsistencies between a table that identifies the booster pumps within the system but does not include the Camp Smith booster pumps that are depicted on the map in the ERP.

Observation 11

Observation Summary: NEIC inspectors reviewed JBPHH PWS’s risk and resilience assessment (RRA) and found that it did not adequately address risks to the system.

Citation:

42 U.S.C. 300i-2 Community resilience assessments

(a) Risk and resilience assessments

(1) In general

Each community water system serving a population of greater than 3,300 persons shall conduct an assessment of the risks to, and resilience of, its system. Such an assessment—

(A) shall include an assessment of—

- (i) the risk to the system from malevolent acts and natural hazards;*
- (ii) the resilience of the pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, electronic, computer, or other automated systems (including the security of such systems) which are utilized by the system;*
- (iii) the monitoring practices of the system;*
- (iv) the financial infrastructure of the system;*

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- (v) the use, storage, or handling of various chemicals by the system; and*
- (vi) the operation and maintenance of the system; and*
- (B) may include an evaluation of capital and operational needs for risk and resilience management for the system.*

(2) Baseline information The Administrator, not later than August 1, 2019, after consultation with appropriate departments and agencies of the Federal Government and with State and local governments, shall provide baseline information on malevolent acts of relevance to community water systems, which shall include consideration of acts that may—

- (A) substantially disrupt the ability of the system to provide a safe and reliable supply of drinking water; or*
- (B) otherwise present significant public health or economic concerns to the community served by the system.*

Evidence:

NEIC inspector observations
JPBHH PWS staff interviews
NAVFAC staff interviews

Description of Observation: According to EPA's AWIA Section 2013 compliance data, the JBPBH PWS certified completion of the RRA by December 31, 2020, certification deadline.

The RRA did not include the Red Hill bulk fuel storage facility as a risk to the JBPBH PWS. The RRA addressed risks from a military attack and did not address a chemical attack or accidental acts that could harm the water system.

A table in the RRA listed the Red Hill shaft as no threat of waterborne contamination to the JBPBH PWS.

The SCADA system was listed as a low risk. Operators do not have individual SCADA log-ins and use a standard administrator log in to access the system.

The RRA did not adequately address the resilience of the original cast-iron pipes in the system.

The RRA did not adequately address the financial infrastructure of the system and the use, storage, or handling of chemicals.

The RRA may include an evaluation of capital and operational needs for risk and resilience management for the system, but it is not required under AWIA. The JBPBH PWS should consider including evaluations of capital and operational needs in the RRA to better position the JBPBH PWS's ability to assess risks to the system.