



**UNITED STATES ENVIRONMENTAL  
PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105**



**STATE OF HAWAII  
DEPARTMENT OF HEALTH  
KA 'OIHANA OLAKINO  
P. O. BOX 3378  
HONOLULU, HI 96801-3378**

June 26, 2023

Rear Admiral Stephen Barnett  
Commander, Navy Region Hawai'i  
850 Ticonderoga St., Ste. 110  
Joint Base Pearl Harbor Hickam, HI 96860-5101  
(Sent via Electronic Mail)

**Subject: Sentinel and Monitoring Well Installation Work Plan Addendum**

Dear Rear Admiral Barnett:

Thank you for submitting the *Draft Sentinel and Monitoring Well Installation Work Plan Addendum #1* (Draft WPA). The Draft WPA was submitted as Enclosure 1 to a letter dated May 18, 2023. Although the letter stated the U.S. Department of the Navy (Navy) "intends to begin utilizing the work plan with Addendum # 1, effective immediately," the Hawai'i Department of Health (DOH) and U.S. Environmental Protection Agency (EPA), hereinafter the "Regulatory Agencies," had no opportunity to review the proposed changes and were not presented the details of the Draft WPA beforehand.

Under Section 7.3 of Attachment A of the 2015 Administrative Order on Consent (2015 AOC), the Navy is required to develop documents associated with the installation of groundwater monitoring wells. In accordance with Item 7 of the 2015 AOC, deliverables required under the 2015 AOC shall be submitted to the Regulatory Agencies for approval or modification. Therefore, we consider this a draft proposal subject to our approval prior to implementation.

It is unclear whether the Hawai'i Department of Land and Natural Resources, Commission on Water Resource Management (CWRM) had an opportunity to review the Draft WPA to ensure the proposed changes to the Navy's program are allowable under its permits. Ensure CWRM is provided a copy of the Draft WPA for review and approval prior to implementation.

The Regulatory Agencies are providing the following comments:

**General Comments:**

- 1) Update the Draft WPA to include a map of current well locations and proposed future well locations. In early 2022, the EPA, DOH, and other stakeholders worked with the Navy to identify multiple well locations that would meet specific data collection objectives. Since the meeting, several of the proposed well locations have shifted or been dropped from the Navy's weekly monitoring well expansion updates. Please refer to the enclosed table documenting the original well objectives, the location changes, and whether updated locations meet original well objectives. All proposed well locations (regardless of access status) should be depicted on a WPA figure, along with completed well locations.
- 2) The Draft WPA does not include any changes to previously approved well locations. In 2022, subject matter experts (SMEs) from the EPA, DOH, Honolulu Board of Water Supply, United States Geological Survey, CWRM, and the Navy worked together to propose and prioritize new well locations that would meet specified objectives (e.g., assess groundwater flow patterns and geology/lithology). Understanding that field conditions and right of entry issues could potentially hinder the installation of wells in specific locations, the SMEs created a figure with well installation zones that would allow the Navy the flexibility to alter a proposed well location, so long as it was still installed within the associated zone to ensure that the specified objectives were still met. Over the past year, the Navy has changed the locations of wells so that they are far from the originally proposed location(s), omitted important proposed wells from recent figures, and added new wells with unclear objectives. The Draft WPA should include a description of these changes, the rationale behind each change, and the identification of any potential data gaps or missed objectives that may result from each change. Prior to the installation of a well in a location other than those previously approved, the Navy should seek input and approval from the SMEs and Regulatory Agencies. Should the installation of a well at an alternate location occur prior to receiving input and approval from the SMEs and Regulatory Agencies, this may result in the necessity to install an additional well(s) if the Regulatory Agencies determine that the alternate well location does not meet the specified objectives.
- 3) Add a section to the Draft WPA to discuss changes since the *Sentinel and Monitoring Well Installation Work Plan* (SMWIWP) was conditionally approved in 2022. For instance, the Navy has proposed alternative well locations MW-1 through MW-5 and presented these wells at public meetings. These wells were not included in the SMWIWP, and it is unclear which data quality objectives (DQOs) will be met with each well. Update the Draft WPA to describe how wells MW-1 through MW-5 will be constructed and which DQOs they will meet. Update the Draft WPA with any additional changes.
- 4) Add a section to the Draft WPA describing barriers that prevent the placement of proposed wells and solutions that the Navy is pursuing. For instance, the Regulatory

Agencies continue to encourage the Navy to pursue the placement of six wells on Queen Emma Land Company (QEL) property. The Navy has had difficulty obtaining right of entry to install the proposed wells in the six locations. The EPA, DOH, Navy, and QEL have been meeting to resolve the access issues. The Navy has reported barriers to placing other wells in housing areas, along roads, etc.

- 5) Upload the associated boring log(s), geophysical log(s) and monitoring well installation construction diagram(s) into the Environmental Data Management System within thirty (30) calendar days following the completed installation of each monitoring well.

### **Specific Comments:**

#### Item #1 – Dual Borehole Approach:

Draft WPA Item #1 recommends coring and well construction in separate boreholes 15 feet apart. The addendum states this is to expedite drilling and to utilize multiple drill rigs to complete wells. While this may be reasonable, the Regulatory Agencies have the following concerns/recommendations:

- The conditions at the borehole used for rock coring and geophysical logging may not be representative of the conditions in the borehole where the well is placed, particularly if the two boreholes are spaced 15 feet apart.
- Ideally, the borehole for rock coring and geophysical logging should be drilled first, be placed close to the well location, and extend as deep as the well borehole. The data from that initial boring should inform the well design. However, the second bullet of Item #1 maintains that well design is independent of these data.
- As described in the February 22, 2022 letter, *Groundwater Monitoring Well Network – Installation of Additional Wells*, the Regulatory Agencies request multiple well screens be installed at sentinel well locations to address deep contamination that may be present in areas distal to the Red Hill Bulk Fuel Storage Facility. The multiple borehole approach may provide an opportunity for the Navy to install two wells at key locations where deeper screens will help assess plume dive. Alternatively, the Navy could evaluate geophysical and water level data to determine at which depths multiple screens will be installed in a subset of wells.

Additionally, the last sentence of Draft WPA Item #1 states “[g]eophysical logging and water level testing for perched water investigations may be conducted in either borehole depending on the order of operations, specific data needs, and hole stability.” This statement is confusing, as it seems to contradict some of the earlier statements in Item #1. It is also unclear why there will be two separate borings, if the geophysical logging and water level testing are conducted in the borehole where the well will be placed, and not the rock coring borehole.

The Regulatory Agencies will consider this change if:

- The boreholes are placed close enough that coring logs represent the geology and hydrogeology of the well borehole;
- The depth of the borehole used for geophysical logging and water level testing is the same depth as the borehole used for well placement;
- The geophysical/water level data are used to inform well design; and
- Installation of more than one monitoring well screens can be accommodated dependent on downhole data and location.

Also provide documentation that CWRM reviewed and approved the changes proposed in Draft WPA Item #1.

Item #2 – Requirements for Conductor Casing:

Draft WPA Item #2 recommends no conductor casing when no evidence of contamination is present. The addendum references past challenges with installing casings and difficulties retrieving core pipes (that could have led to the abandonment of the well itself). The EPA has the following concerns:

- Future contamination may potentially reach the basal aquifer if no conductor casings are installed.
- Current contamination may not be identified with the proposed screening techniques, so wells may inadvertently be constructed without conductor casings within dissolved-phase plumes. Note that not all contamination can be identified in the field. There may be no smell or visual evidence of dissolved-phase fuel additives, other fuel components, or per- and polyfluorinated substances. Some of these contaminants will not trigger photoionization detectors readings.

While the Regulatory Agencies understand the concern about losing equipment, we do not approve the Draft WPA Item #2 recommendation. Refer to the approved protocols in the SMWIWP when determining whether to install conductor casing in Red Hill groundwater monitoring wells.

Item #3 – Change in Well Design Conductor Casing Diameter:

If conductor casings are installed, Draft WPA Item #3 recommends using smaller conductor casings while still allowing for a 4-inch casing to be installed. The addendum states this may expand the list of drillers available that offer this service.

The Regulatory Agencies agree with Draft WPA Item #3, assuming CWRM reviewed and approved this proposed change.

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Item #4 – Tunnel Well Drilling:

Draft WPA Item #4 recommends changes to drilling equipment to allow for drilling within the lower access tunnel. It also sets criteria to determine whether a conductor casing is installed. The Regulatory Agencies reiterate our concerns that not installing conductor casings, especially within the lower access tunnel, increases the risk of contamination reaching the basal aquifer from future contamination migration.

The Regulatory Agencies do not approve the Draft WPA Item #4 recommendation. Refer to the approved protocols in the SMWIWP when determining whether to install conductor casing in Red Hill groundwater monitoring wells.

**References:**

Please consider these additional, relevant references:

- EPA/540/S-95/503, Nonaqueous Phase Liquids Compatibility with Materials Used in Well Construction, Sampling, and Remediation
- ASTM standard D5092, Design and Installation of Ground Water Monitoring Wells in Aquifers

The Regulatory Agencies are committed to working with the Navy to ensure effective, efficient, and safe well installation. Wells should be constructed in a manner that protects the underlying aquifer and produces data that will fulfill specific project DQOs. Please schedule a meeting between the Navy, EPA, DOH, Honolulu Board of Water Supply, U. S. Geological Survey, and CWRM subject matter experts, so we can evaluate data gaps and agree on new well locations that will meet DQOs.

If you have any questions regarding this letter, please contact Grant Scavello, EPA Red Hill Project Coordinator, at [Scavello.Grant@epa.gov](mailto:Scavello.Grant@epa.gov) or (415) 972-3556; or Kelly Ann Lee, DOH Red Hill Project Coordinator, at [KellyAnn.Lee@doh.hawaii.gov](mailto:KellyAnn.Lee@doh.hawaii.gov) or (808) 586-4226.

Sincerely,



Acting for Grant Scavello  
Red Hill Project Coordinator  
U.S. Environmental Protection Agency, Region 9



Kelly Ann Lee  
Red Hill Project Coordinator  
State of Hawai'i, Department of Health

Enclosure: Table - Objectives for Installing Wells

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cc: VADM John Wade, Commander, Joint Task Force – Red Hill  
Sherri Eng, Environmental Director, Navy Region Hawai‘i  
Donald Panthen, Red Hill PMO Director, Navy Region Hawai‘i  
Josh Stout, Red Hill PMO Deputy Director, Navy Region Hawai‘i  
RDML Jeffrey Kilian, Commander, NAVFAC Hawai‘i  
CAPT Cameron Geertsema, Commanding Officer, NAVFAC Hawai‘i  
CAPT James Sullivan, Red Hill Environmental OIC, NAVFAC Hawai‘i  
LCDR Travis Myers, Aquifer Recovery Team Lead, NAVFAC Hawai‘i  
Caroline Rossi, Monitoring Well Expansion Lead, NAVFAC Hawai‘i  
Dr. Donald Thomas, Director of Center for the Study of Active Volcanos, UH – Hilo