



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
**COMMISSION ON WATER RESOURCE MANAGEMENT**  
P.O. BOX 621  
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

June 14, 2022  
Honolulu, Hawai'i

Take Action on the Recommended Actions Proposed by the Red Hill Permitted Interaction Group to the Commission on Water Resource Management Formed and in Accordance with the Scope of Investigation Defined under Item B-1 at the January 7, 2022 Meeting, Regarding the Red Hill Bulk Fuel Storage Facility Emergency

SUMMARY OF REQUEST

Staff is requesting that the Commission on Water Resource Management (Commission) deliberate and take action on the recommended actions proposed by the Red Hill Permitted Interaction Group as presented at the Commission's May 17, 2022 meeting. A redlined copy of the briefing submittal is attached (Exhibit 1) with no substantive changes other than minor corrections made to certain inaccurate statements.

BACKGROUND

At its January 7, 2022 meeting, the Commission agreed to "use its full range of authority and capacity to work with all stakeholders to monitor, evaluate, and enforce both short and long-term efforts and actions to eliminate the threat of the current Red Hill Bulk Storage Facility to O'ahu's water resource." The Commission also established the Red Hill Permitted Interaction Group of three Commissioners to help identify the specific actions for the broader Commission to take within its jurisdiction.

LEGAL AUTHORITY

The Commission has unique and explicit public trust responsibilities for managing water not held by any other State entity. The Hawai'i Water Code HRS §174C provides comprehensive legal authority, to address aspects of the Red Hill crisis, especially regarding the near-term water shortage situation and longer-term aquifer management and recovery. Specifically, the State Water Code shall be liberally interpreted to protect and improve the quality of waters of the State and to provide that no substance be discharged into such waters without first receiving the necessary treatment or other corrective action. The people of Hawai'i have a substantial interest in the prevention, abatement and control of both new and existing water pollution and in the maintenance of high standards of water quality. HRS § 174C-2(d). The Permitted Interaction Group was created pursuant to HRS § 92-2.5.

## RECOMMENDATIONS

Staff recommends that the Commission:

- 1) **Modify the Navy's three water use permits with special conditions to require the development of a comprehensive aquifer remediation and recovery plan that includes implementation schedules, responsible agencies, and funding requirements.** Primary authors for such a plan should include the Commission, DOH, US Department of Defense, and EPA. This plan should build upon and support current planning efforts such as the existing Red Hill Shaft Recovery and Monitoring Plan, the Pearl Harbor Water Resources Management Plan, the recently configured Remediation and Restoration Action Plan Committee, and relevant Emergency Orders and directives from the DOH. Areas to be addressed in the plan should include:
  - a. **Remediation progress:** Demonstrated progress on remediation measures for existing contamination. This includes aiding remediation efforts for contamination that extends beyond Navy property;
  - b. **Water quality data sharing:** All ground and surface water monitoring results and risks are shared with the Commission, DOH, and the HBWS in a way that is transparent, complete, and timely;
  - c. **Modeling progress:** Demonstrated progress on groundwater and contaminant fate and transport modeling;
  - d. **Contingency plans:** Development of and funding to implement an immediate aquifer recovery and remediation contingency plans in case of release during defueling;
  - e. **Water shortage plan implementation:** Navy must regularly present and make meaningful progress on water conservation, recycling, and shortage actions to account for their impact on the aquifer.
  - f. **Sampling and monitoring** of water chemistry and physical properties and biota at spring-fed sites, including wetlands, lo'i kalo, and loko i'a, potentially affected directly by the contamination from Red Hill or indirectly through altered Navy pumping patterns.
- 2) **Initiate a Commission process to modify the three NAVFAC Hawai'i Water Use Permits and permits of other Pearl Harbor and Honolulu Aquifer System water users as appropriate for managing the anticipated water shortages.**
- 3) **Ensure, with Commission action if necessary, that existing policies to address water shortages can be utilized and effectively and equitably enforced to address the anticipated water shortages and/or water emergency resulting from aquifer contamination.** Such policies, in addition to addressing water use permit holders, must also consider the broader scope of the public trust, including protection of traditional and

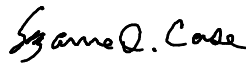
customary rights and practices associated with numerous fresh and brackish springs of the Pu'uloa/Pearl Harbor region.

Ola i ka wai,



M. KALEO MANUEL  
Deputy Director

APPROVED FOR SUBMITTAL:



SUZANNE D. CASE  
Chairperson

Exhibits

1. Redlined Copy of May 17, 2022 Red Hill Permitted Interaction Group Submittal

# RED HILL PERMITTED INTERACTION GROUP SUBMITTAL

## COMMISSION ON WATER RESOURCE MANAGEMENT

May 17, 2022

Honolulu, O‘ahu

Status Update and Recommendations from the Red Hill Permitted Interaction Group on the Scope of Work Approved at the January 7, 2022 Meeting

### SUMMARY OF REQUEST

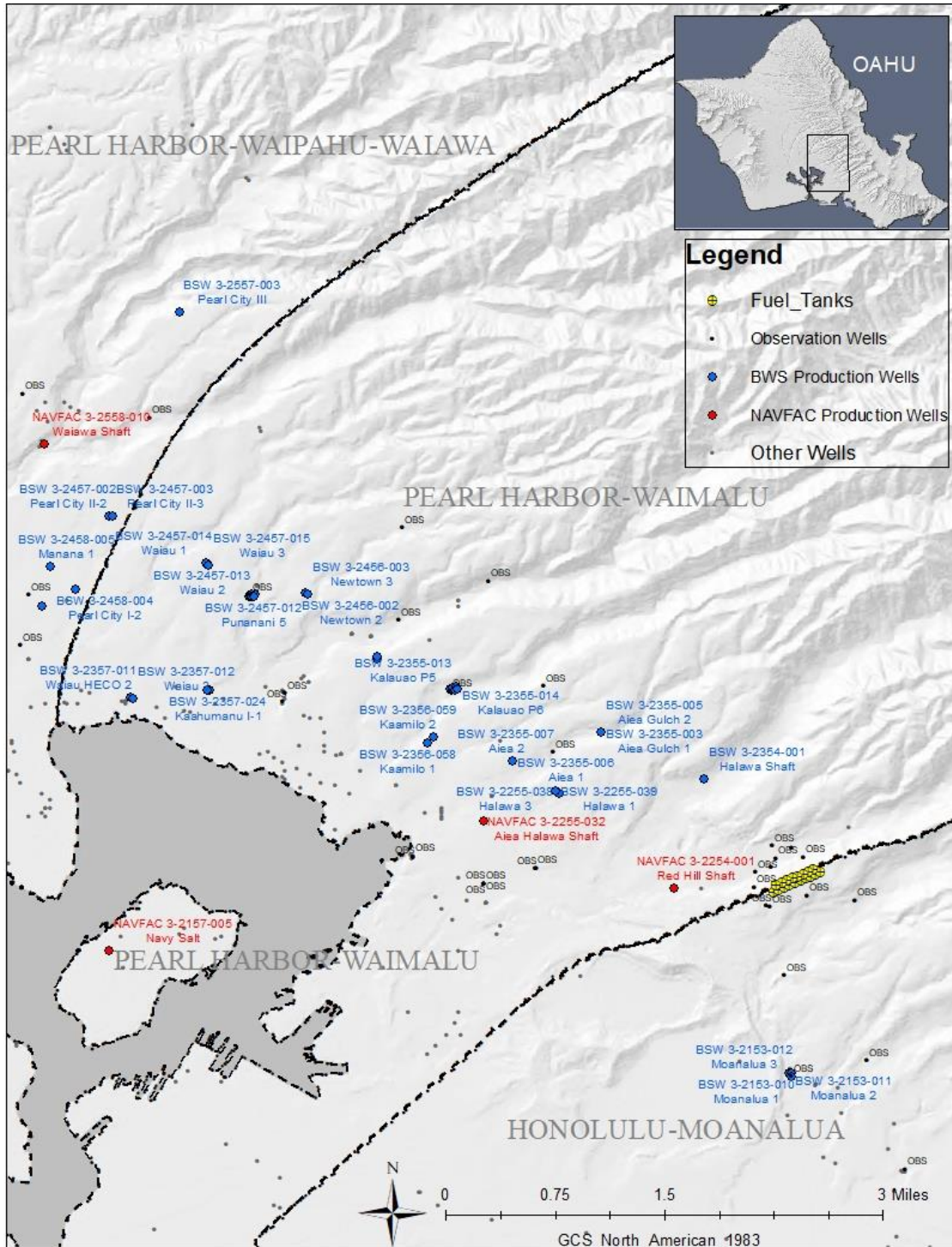
No action; for information purposes only.

The purpose of this update to the Commission on Water Resource Management (Commission) is to provide the Red Hill Permitted Interaction Group’s (~~The referred to hereinafter as the “Group”~~Group) report on the progress being made in the Red Hill crisis, the role of the ~~Commission on Water Resource Management~~ (Commission) in addressing its public trust responsibilities, the goals of future Commission actions, and recommendations for the Commission to deliberate and act upon at its next meeting ~~in June~~. The Group requests that the Commission consider and review the following recommendations for deliberation and decision-making at its next regular meeting ~~on~~ June 14, 2022.

- Review recommended special conditions to modify three (3) water use permits held by NAVFAC Hawai‘i and associated with the Red Hill incident to ensure appropriate remediation and protection of the waters of Hawai‘i.
- Initiate a Commission process to modify the NAVFAC Hawai‘i water use permits as well as permits of other Pearl Harbor and Honolulu Aquifer System water users as appropriate for managing anticipated water shortages.
- Ensure, with Commission action if necessary, that existing policies to address water shortages can be utilized and effectively and equitably enforced to address the anticipated water shortages and/or water emergency resulting from aquifer contamination. Such policies, in addition to addressing water use permit holders, must also consider the broader scope of the public trust, including protection of traditional and customary rights and practices associated with numerous fresh and brackish springs of the Pu‘uloa/Pearl Harbor region.

## Location

The location of interest is the area on the island of O‘ahu surrounding the Red Hill Bulk Fuel Storage Facility (**RHBFSF**) and the Red Hill Shaft which previously supplied a portion of the drinking water to the Navy’s **Joint Base Pearl Harbor-Hickam** and Army’s **Aliamanu Military Reservation Public Water Systems**.



## Background

At its January 7, 2022 meeting, the Commission adopted a position that the Commission would “use its full range of authority and capacity to work with all stakeholders to monitor, evaluate, and enforce both short and long-term efforts and actions to eliminate the threat of the current Red Hill Bulk Storage Facility ~~yy~~ to Oahu’s water resource.” The Commission also established ~~thea Permitted Interaction~~ Group of three (3) Commissioners (~~referred to hereinafter as the “Group”~~) with the scope of identifying specific actions for the broader Commission to take within its jurisdiction at subsequent meetings. See **Exhibit 1** for the Group’s scope as amended and approved in the January 7, 2022 minutes and **Exhibit 2** for the Commission’s legal authority on the Red Hill issue.

At the February 15, 2022 meeting, the Group recommended the following three (3) actions for ~~to~~ the Commission to consider:

- Initiate a ~~Water~~ Commission process to update the three (3) NAVFAC Hawai‘i Water Use Permits ~~permit to add~~ permit modifications and special conditions ~~for the three NAVFAC Hawai‘i Water Use Permits~~ to protect the waters of ~~-Hawai‘i~~ Hawaii.
- Recommend the permanent decommissioning of the Red Hill underground fuel tanks as a special condition of the updated water use permits.
- Prepare for an emergency water shortage, in consultation with the Honolulu Board of Water Supply (HBWS),~~;~~ for the Pearl Harbor and Honolulu aquifers for the upcoming dry season.

There have been many Red Hill activities since that meeting, the most significant of which is the Department of Defense’s commitment made on March 7, 2022 to permanently decommission the ~~Red Hill~~ RHBFSF fuel tanks ~~made on March 7, 2022~~. Group members have been ~~actively~~ active ~~in~~ attending meetings, webinars, and discussions with stakeholders.

### Group Key Points on Red Hill Fuel Leaks ~~Takeaways~~

- The ~~Red Hill~~ RHBFSF fuel leaks are the single biggest threat to South O‘ahu’s drinking water since the establishment of the Water Code.
- Scientific uncertainty surrounding the recent fuel release and contamination will not be resolved in the short-term. This includes the amount of fuel leaked, full characterization of contaminants in both the drinking water and the aquifer, the expected persistence of the spilled contaminants, the geological, chemical, and biological features that determine the movement and fate of the leaked fuel, and the process to remediate and restore the aquifer to an acceptable state.
- The public does not trust the Navy’s commitment or capability to safely decommission the fuel tanks and address the long-term remediation and recovery of the aquifer.
- The citizens and businesses of Hawai‘i are looking for leadership and transparency from their state officials. The Red Hill issues, however, will extend past the current Administration and sitting Commissioners.
- Ongoing and upcoming legal issues may hinder recent progress on data sharing and public transparency between multiple parties and respective stakeholders.

- The issues of water quality and water quantity are inextricably linked. This is because the return of HBWS's Hālawā Shaft as a municipal water source depends on assurance that no contaminants from ~~Red Hill~~the RHBFSF will enter the ~~Honolulu Board of Water Supply~~ distribution system.
- Addressing the Red Hill issue requires multi-agency, multi-stakeholder coordination. The first steps entail better coordination between the state agencies tasked with managing water quality (Department of Health, (DOH)) and water quantity/aquifer health (~~Commission on Water Resource Management~~) as well as coordination with county agencies (HBWS) and federal agencies (Navy, US Environmental Protection Agency (EPA) but also US Geological Survey (USGS) and possibly US Fish and Wildlife Service (USFWS)).
- While DOH has identified multiple ongoing planning efforts, no comprehensive roadmap yet exists that identifies work plans, implementation schedules, responsible agencies, and funding requirements for aquifer remediation and recovery.

### Role of the Commission

- The Commission has unique and explicit public trust responsibilities for managing water not held by any other State entity.
- The Commission is the primary state agency in regulating water use in ~~the affected~~ aquifers through its water use and well construction permitting process.
- The ~~Hawai'i~~ Water Code provides comprehensive legal authority, which it has not ~~been~~ fully exercised to date, to address aspects of the Red Hill crisis, especially regarding the near-term water shortage situation and longer-term aquifer management and recovery.

Until now, the Commission has only acted in an advisory role in past and current Red Hill planning and legal documents. The Commission, however, has an opportunity to fulfill its duties by directly and strategically working with other state agencies and their ~~d~~irectors including the ~~Hawai'i Department of Health~~DOH Environmental Health Administration ~~branches~~ and Department of Land and Natural Resources divisions.

### Goals for Future Commission Actions

- Ensure no over-pumping of the aquifer during the current emergency water shortage condition.
- Facilitate the creation of an enforceable plan for aquifer remediation and recovery with stated responsibilities and funding.
- Monitor and ensure the safe decommissioning of the ~~Red Hill~~RHBFSF fuel tanks.
- Provide for public transparency as a trusted outlet for accurate and timely information.
- Establish a more formalized framework for interagency coordination.

## Recommended Commission Actions

1) **Modify the Navy's three water use permits with special conditions in alignment with ongoing efforts to develop a comprehensive Red Hill Remediation and Restoration Action Plan that includes implementation schedules, responsible agencies, and funding requirements.** The authors for this plan ~~presently include~~ are the ~~Hawai'i Department of Health~~DOH and ~~US Environmental Protection Agency~~EPA with technical input from: US Navy, ~~Honolulu Board of Water Supply~~HBWS, ~~USGS Geological Survey~~, and the ~~Hawai'i Commission on Water Resource Management~~. While DOH and EPA are convening the planning, the plan should build upon the existing Red Hill Shaft Recovery and Monitoring Plan, the Pearl Harbor Water Resources Management Plan, relevant Emergency Orders and directives from the ~~DOH~~State Department of Health, and the conditions below. It is imperative that the Commission is fully engaged in the plan development and our objectives are clearly articulated and folded into the comprehensive Remediation and Restoration Action Plan. Areas to be addressed in the plan and/or modified permits must include:

- a) **Remediation progress:** Demonstrated progress on remediation measures for existing contamination. This includes aiding remediation efforts for contamination that extends beyond Navy property;
- b) **Water quality data sharing:** All ground and surface water monitoring results and risks are shared with the ~~Hawai'i Commission on Water Resource Management~~, ~~State Department of Health~~DOH, and the ~~Honolulu Board of Water Supply~~HBWS in a way that is transparent, complete, and timely;
- c) **Modeling progress:** Demonstrated progress on groundwater and contaminant fate and transport modeling;
- d) **Contingency plans:** Development of and funding to implement an immediate aquifer recovery and remediation contingency plans in case of release during defueling;
- e) **Water shortage plan implementation:** Navy must regularly present and make meaningful progress on water conservation, recycling, and shortage actions to account for their impact on the aquifer.
- f) **Sampling and monitoring** of water chemistry and physical properties and biota at spring-fed sites, including wetlands, lo'i kalo, and loko i'a, potentially affected directly by the contamination from ~~Red Hill~~the ~~RHBFSF~~ or indirectly through altered Navy pumping patterns.

2) **Initiate a Commission process to modify the three (3) NAVFAC Hawai'i Water Use Permits and permits of other Pearl Harbor and Honolulu Aquifer System water users as appropriate for managing the anticipated water shortages.**

3) **Ensure, with Commission action if necessary, that existing policies to address water shortages can be utilized and effectively and equitably enforced to address the anticipated water shortages and/or water emergency resulting from aquifer contamination.** Such policies, in addition to addressing water use permit holders, must also consider the broader scope



of the public trust, including protection of traditional and customary rights and practices associated with numerous fresh and brackish springs of the Pu‘uloa/Pearl Harbor region.

### INVESTIGATION AND CORE COMMISSION RESPONSIBILITIES

On January 13, 2022 after individually polling commissioners on their interest in serving on the Red Hill Permitted Interaction Group, Chair Suzanne Case notified commissioners Mr. Michael -Buck, Dr. Aurora Kagawa-Viviani, and Mr. Paul Meyer that she had selected them to serve on the PIG/Advisory Group. Each Group member conducted independent research into both publicly available information in the news, media releases, and public hearings and presentations and consulted subject matter experts. Members of the Group also:

- Maintained exchange over email and weekly virtual meetings including with CWRM staff;
- Attended standing Tuesday/Thursday meetings of the Aquifer Recovery Focus Group hosted by NAVFAC;
- Attended standing meetings and exchanges of the UH Red Hill Task Force;
- Attended informational seminars by subject matter experts hosted by the UH Water Resources Resource Center; and
- Met independently with the Honolulu Board of Water Supply HBWS.

The key points below reflect key themes of the Group’s investigation over the past several months.

Findings of Fact: Department of Health DOH investigations have already established damage to environmental and human health from the Red Hill Facility RHBFSF operations and the persistent risk associated with the continued operation of the facility.

The Department of Health (DOH) Hearings Officer’s Report No.21-UST-EA-02 was submitted on 12/27/2021 and accepted on 01/03/2022 (Exhibit 4, No. 6) with a confirmation that the Report accurately and completely states the relevant facts. See the Feb 15, 2022 submittal (Exhibit 2) for an unedited compilation of the relevant Findings of Facts with stark implications for the health and future use of the State’s most important freshwater source.

Key points:

- *There have been numerous reported releases from the Red Hill Facility over the past 80-years or so: at least 76 incidents involving nearly 200,000 gallons of fuel. More likely than not, these figures understate the true number of releases or the total volume of fuel actually released.*
- *The probability of an acute leak of 1,000 to 30,000 gallons of fuel each year is at least 27%, which is likely an understated percentage. The probability of a sudden release of more than 120,000 gallons of fuel in the next 100 years is at least 34%, which is likely an understated percentage. The expected volume of chronic, undetected fuel releases from the Red Hill Facility is at least 5,803 gallons per year.*
- *The weight of the evidence establishes that the Red Hill Facility, as currently situated, is a metaphorical ticking timebomb located 100 feet above the most important aquifer on Hawaii’s most populous island. The Red Hill Facility has already damaged human health and the environment and, as currently situated, inevitably threatens to do so into the*

*future. The Navy lacks the ability to control the substantial risks associated with the Red Hill Facility, as currently situated.*

Persistent Issue: While the Pentagon March 7, 2022 announcement on the permanent closure of the ~~RHBFSF~~ **Red Hill Bulk Fuel Storage Facility** ([link here](#)) does much to address the Group's concerns about future releases to the aquifer, the defueling process still poses a risk to water resources and the extent, persistence, and hazards of the existing contamination remain poorly characterized.

Key points:

- The Secretary of Defense will be provided a “defueling plan of action with milestones to defuel the facility” developed by the Secretary of the Navy and Defense Logistics Agency Director by May 31, 2022 with target completion within 12 months after the facility is deemed safe for defueling.
- The Secretary of the Navy is also responsible for planning and budgeting corrective action for prior releases.
- Besides DOH and EPA (AOC parties) there remains a need for other state and federal agencies to engage in the solution. Many of these entities will require federal funding to support their continued participation or institutional capacity to respond to this crisis through additional personnel.

Precautionary Principle: The Commission must simultaneously acknowledge scientific uncertainty while taking action to protect the public trust

The Group believes the Commission must apply the precautionary principle to managing the aquifer and waters affected by the contaminant release(s) from the ~~Red Hill facility~~ **RHBFSF** due to the critical importance of this aquifer and possibility of “plume diving” (transport of dissolved petroleum and hydrocarbon oxidation products; see Figure 2 of <https://www.epa.gov/system/files/documents/2022-03/epa-hdoh-groundwater-monitoring-well-network-letter-2022-02-22-final.pdf> also [API Soil and Groundwater Technical Task Force Bulletin 24, April 2006](#)) that has implications not only for drinking water but also all protected public trust purposes. The direct and indirect impacts of the fouling of Red Hill ~~s~~Shaft and potential contaminant movement in the Moanalua and Waimalu aquifers include:

- Loss of Red Hill Shaft (Navy) as a drinking water resource for an undetermined time.
- Suspension of the Navy's Aiea-Hālawa well and ~~Honolulu~~-BWS Hālawa ~~s~~Shaft, Aiea and Hālawa wells for an undetermined time.
- Increased pumping of Waiawa (Navy) and other HBWS system wells to make up for the loss of these two significant potable water sources of Red Hill Shaft and Hālawa Shaft and potential for increased chlorides at these other wells.
- Potential or likely impacts to springs of the Pu'uloa/Pearl Harbor region in terms of water quality (due to contamination) and reduced flows (due to pumping of other water resources in Waiawa).

The precautionary principle is a legal approach, called for in the Water Code and affirmed in case law (Waiāhole I), to proactively address present and potential environmental degradation to

protect the public despite current scientific uncertainty. It is especially relevant given the critical importance of the waters of this region to southern O‘ahu and Honolulu’s urban core.

**Interagency Coordination:** Critical need for strengthened CWRMommission-DOH coordination to 1) address interconnected water quality and water quantity issues and 2) ensure accountability through the processes of defueling, aquifer remediation and mitigation of impacts to aquifer health

- CWRMommission staff already issue well construction permits, and the Survey Branch has been and will continue to play a key role in the siting and registration of new monitoring wells for surveillance in the region surrounding RHBFSF.
- The lack of a contamination trigger for water shortage planning highlights a gap in the Water Quality Plan (DOH-led) and Water Resource Protection Plan (CWRMommission-led) that must be addressed in the CWRMommission-led Hawai‘i Water Plan Framework and water shortage planning efforts. The CWRMommission Planning Branch staff recently initiated staff-to-staff exchanges with DOH and HBWS and should continue to develop a stronger framework for interagency communication and collaboration. These exchanges should be institutionalized/formalized and establish clear roles, responsibilities within the relevant divisions of the agencies and to ensure effective crisis response and coordination.
- Additional personnel will likely be needed to support these interagency exchanges related to Red Hill.

**Transparency:** The Commission plays an important role in facilitating transparency and agency accountability through its public meetings and should continue in this role as part of increasing public understanding of the issue and public trust in government.

- Regular (monthly) and public informational briefings on Red Hill at Commission meetings should continue with participation by the Navy, DOH, HBWS, Commission staff and other affected stakeholders and subject matter experts. Regular updates could include:
  - NAVFAC progress on Red Hill Shaft Recovery and Monitoring Plan
  - DOH water quality monitoring and findings
  - HBWS and CWRMommission staff on water shortage situation
  - Other stakeholders on status of public trust uses/priorities
- Commission staff and Group should continue to attend and engage in the NAVFAC-convened Aquifer Recovery Focus Group and other interagency exchanges

**Public Trust:** While much public attention has focused on threats to drinking water quality and quantity, the Commission’s responsibilities are broad and must consider its all-encompassing mandate to protect water as a public trust for a multitude of stakeholders.

- The Commission has a mandate to uphold public trust purposes including environmental protection, traditional and customary Native Hawaiian rights, appurtenant rights, domestic uses (distinct from municipal uses), and reservations of the Department of Hawaiian Home Lands. Many springs of Pu‘uloa (Pearl Harbor) reflect the strong groundwater-surface water connectivity of the region. This highlights potential problems where dissolved contaminants from Red HillRHBFSF might surface. It also highlights

that the planned increased pumping in the Pearl Harbor aquifer system area to the west of Hālawā could potentially reduce spring flow and negatively impact remaining spring-dependent wetland and coastal systems including but not restricted to those below:

- a. Ke awalau o Pu‘uloa: This largest estuary in the islands was known for an abundance of freshwater springs (Figure 2) and associated fishponds (Figure 3)
  - b. Farms and lo‘i kalo in Kalauao (Figure 4) and historic Waiawa (Figure 5)
  - c. Present-day community stewardship organizations working in Pu‘uloa (Figure 6)
  - d. Pearl Harbor National Wildlife Refuge encompassing two wetland systems (Honouliuli and Waiawa), and one anchialine system (Kalaeloa) (Figure 7)
- We recommend as part of the action plan above and attached as a permit condition, the Navy support with resources the State of Hawai‘i, the USFWS, and community groups that are currently using and plan to enlarge, expand, and enhance culturally managed wetlands in Pu‘uloa to mitigate for damage and increase the resiliency of the biocultural systems impacted by contamination from the ~~Red Hill Fuel Bulk Facility~~ RHBFSF and related events (changed pumping regimes, etc.)

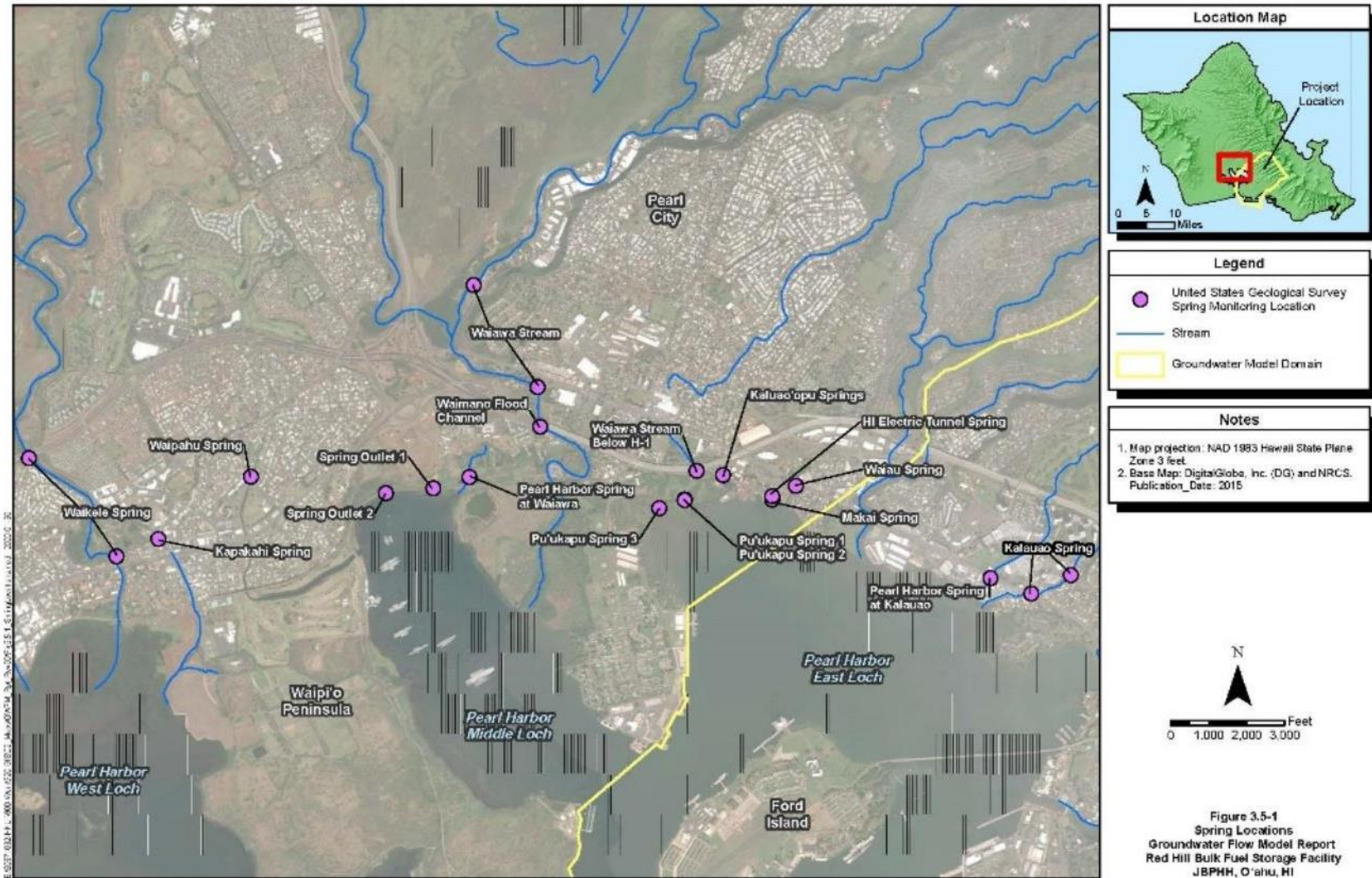


Figure 2. Spring locations in the Pu'uloa region. Source: [NAVFAC Hawai'i Groundwater Flow Model Report \(3/2020\)](#) Figure 3.5-1



Figure 4. Present-day spring-fed farms in Kalauao, several miles from Red Hill Shaft



Source: <http://www.hjcc.com/past-events/2021/5/26/hjcc-kaonohi-farm-loi-workday>



Sources: <http://movingmama.blogspot.com/2010/12/sumida-watercross-farm.html>



Source: Sumida and Ka'onohi Farms <https://www.google.com/maps/@21.3839283,-157.9426834,403m/data=!3m1!1e3>





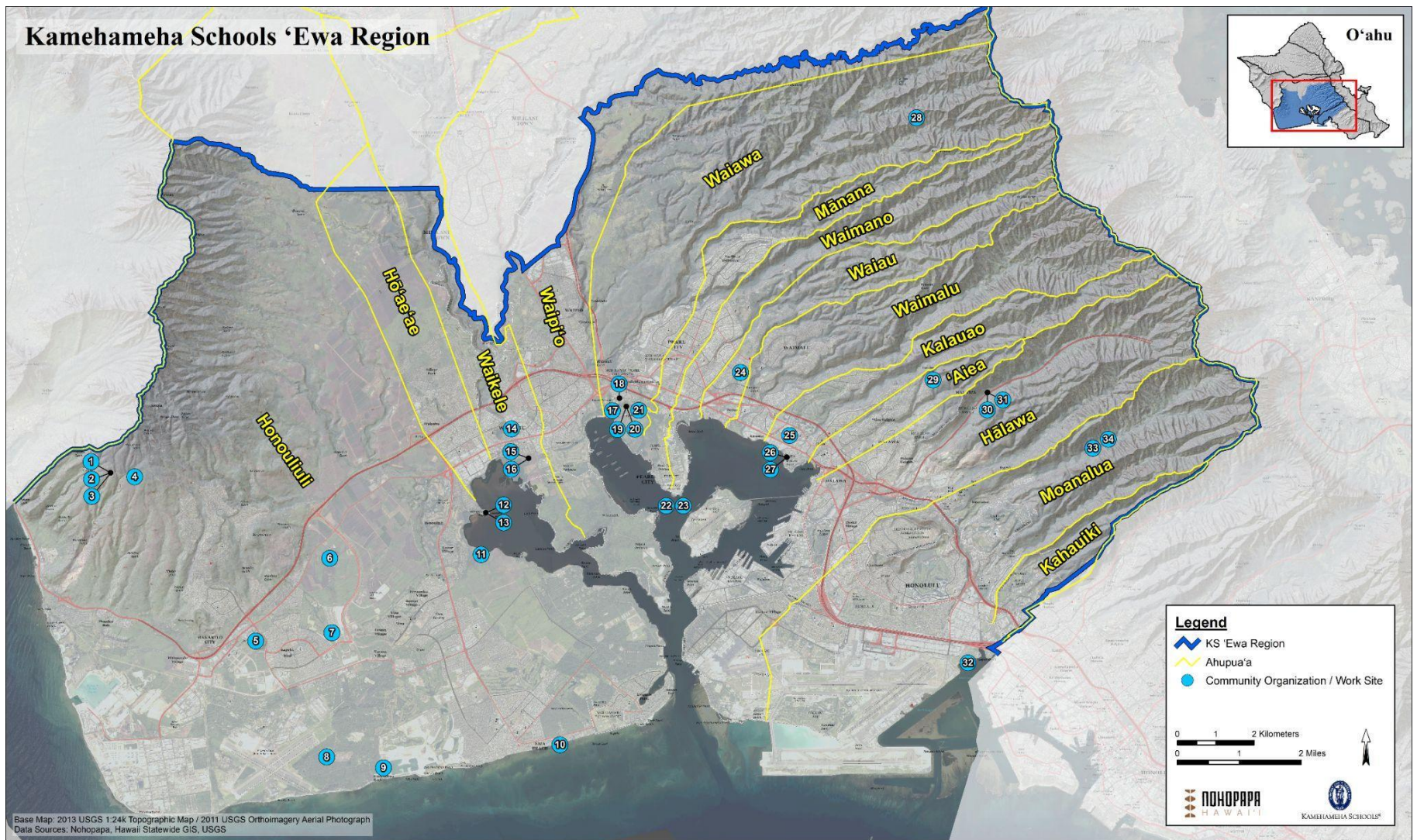


Figure 6. Present-day community stewardship organizations working in Pu'uloa. Source: [Hālau o Pu'uloa 'Ewa 'Āina Inventory](#) prepared by Nohopapa Hawai'i for Kamehameha Schools (2018) Figure 2

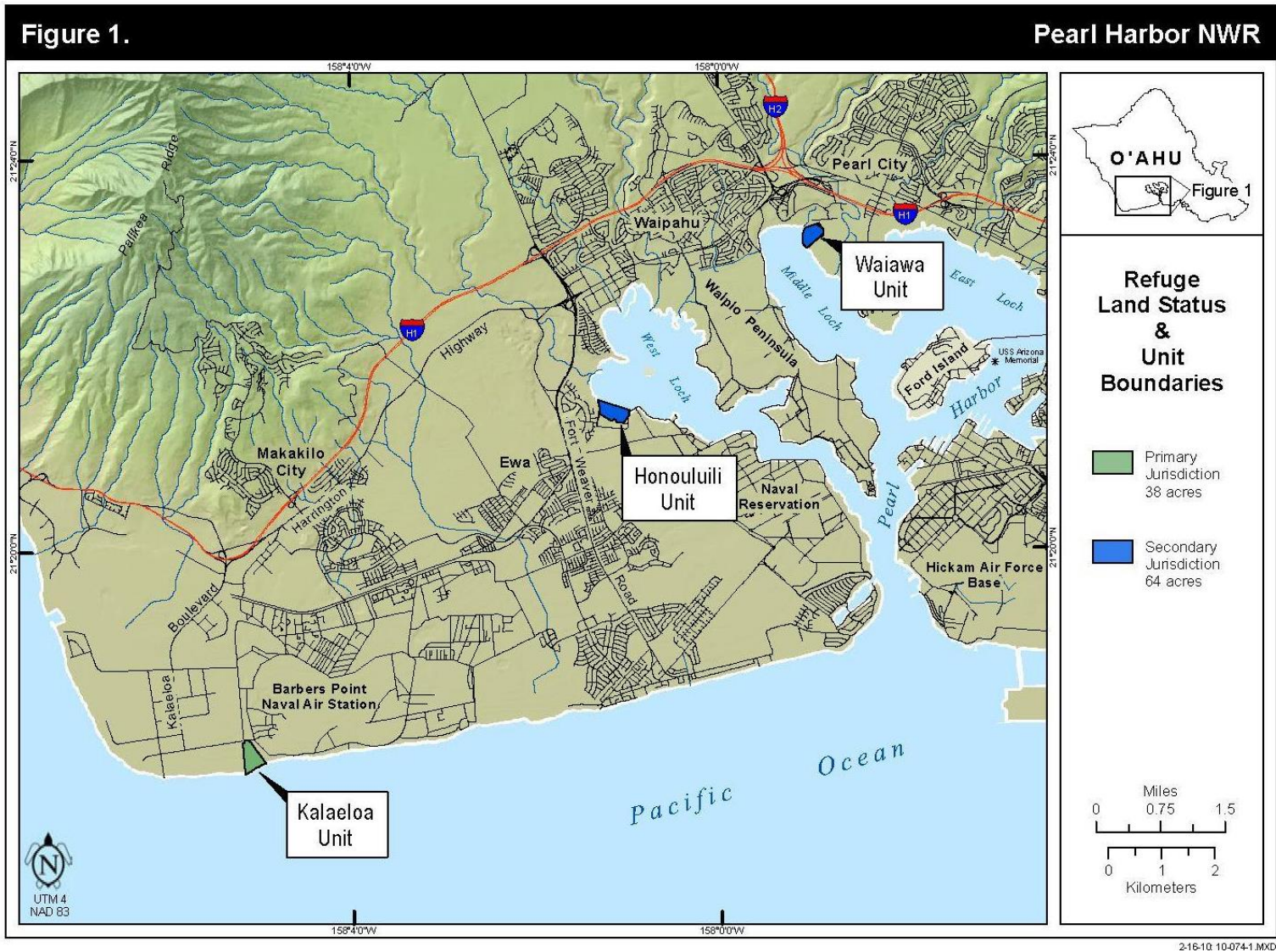


Figure 7. Pearl Harbor National Wildlife Refuge encompassing two wetland systems (Honouliuli and Waiawa), and one anchialine system (Kalaeloa) Source: [Pearl Harbor National Wildlife Refuge Comprehensive Conservation Plan \(2010\)](#) Figure 1

## SCOPE-SPECIFIC ANALYSES

### *a) NAVFAC Hawai'i Water Use Permit Modifications*

In establishing the Group, the Commission identified its initial scope of work was to “recommend potential permit modifications and conditions for the NAVFAC Hawai'i Water Use Permits.” The water use permits associated with the Navy's water system affected by the ~~Red Hill RHBFSF~~ release were issued prior to the establishment of the State Water Code and have no standard or special conditions attached to them. The Group, supported by the Deputy AG, established that the Commission has full authority to modify the Navy water use permits.

The three Navy permits in question are:

- 3-2254-001 Red Hill Shaft, constructed in 1943 (Water Use Permit no. 00085 issued in 1980 for 4.659 mgd); -- **Pumped at around 5 mgd, run through filtration, and discharged to Hālawā Stream; not available for drinking water**
- 3-2255-032 'Aiea-Hālawā Shaft, constructed in 1937 (Water Use Permit no. 00086 issued in 1980 for 0.697 mgd); -- **Offline for the foreseeable future**
- 3-2558-010 Waiawa Shaft, constructed in 1951 (Water Use Permit no. 00111 issued in 1980 for 14.977 mgd). – **Currently supporting all Navy system water users**

**The Group recognizes the critical importance of eliminating risk of continued/future contamination and ensuring accountability through the processes of defueling, aquifer remediation, mitigation of impacts to aquifer health and other stakeholders**

On Feb 15, 2022, the Group put forth an initial recommendation to require permanent decommissioning of the ~~Red Hill underground RHBFSF~~ fuel tanks and require appropriate remediation, monitoring, and modeling to protect, inform, and minimize impact to other stakeholders in the region (see [submittal for February 15, 2022](#)). Although the March 7, 2022 Pentagon announcement of the permanent defueling of the tanks addresses the Group's initial concern over future releases, the current hazard persists along with potential for releases during the defueling process which will extend over the next 12 months or more.

Even with the permanent decommissioning of the tanks, a lengthy and expensive remediation and monitoring appears necessary to attempt to track and minimize the impact of the contaminant mixture in the aquifer. The ~~Honolulu Board of Water Supply (HBWS)~~ has shut down its pumping in the affected region to avoid drawing contaminants into its own distribution system, anticipating it will take years before Hālawā Shaft and other smaller wells in the 'Aiea-Hālawā area return to ~~use~~. The necessary work ahead includes plume monitoring through an expanded system of monitoring wells, regular sampling and monitoring of both ground and surface waters, including groundwater-fed springs, timely data sharing, and scientifically rigorous modeling of groundwater flows and contaminant fate and transport that does not presently exist. Note also that the EPA and DOH rejected the Navy's groundwater flow model (see [March 17 memo including HDOH technical review](#)). HBWS has indicated that when pumps are turned on, they will run at partial capacity and if contaminants are present, would require expensive treatment to clean drinking water to much higher water quality standards than set by DOH emergency action levels.

**Keep Red Hill on the agenda for monthly CWRMommission meetings with participation and attendance by Navy, DOH, HBWS and other stakeholders affected by the Red HillHBFSF contamination.**

This supports transparency, accountability, and coordination on this matter and through non-permit routes.

Addresses scope of work item:

*1a-iv) Suggest how the Commission can assist in public disclosure of the status of the Red Hill Facility, including the progress of Navy actions to defuel its petroleum fuel storage tanks, with attendance by informed Navy officials at future Water Commission meetings.*

**Disregard proposed permit modifications that are already being addressed through different routes both within and external to the CWRMommission:**

Scope of work item: *1a-i) A required implementation schedule, monitoring protocol, and enforcement of the Drinking Water Sampling Plan approved by the Department of Health.*

The Department of HealthDOH has amended the health advisory for all 19 residential zones, declaring them safe to drink, and expects to lift the advisory upon receiving additional information from the Navy on non-residential areas of the distribution systems (see April 19, 2022 CWRMommission meeting). While DOH has been effective at carrying out and enforcing the plan according to stated goals, many residents receiving water from the Navy system remain distrustful of the quality of their household tap water. Testing tap water for contaminants however lies somewhere between the regulatory body of DOH, the water purveyor (Navy/NAVFAC/Army), and the property owner/managers and not within the capacity of the CWRMommission.

The Group members note, however, that the Commission has an important role to play in ensuring responsible cleanup by the Navy and broadly supporting aquifer remediation and protection. In doing this public trust in both drinking water supplies and in government agencies tasked with ensuring cleanliness and sufficient supply of water (DOH, CWRMommission) can be restored/maintained. **The Commission should thus continue to support transparent exchange through the forum of its regular meetings which allow for public testimony, scrutiny, and participation.**

Scope of work item: *1a-ii) Determine the appropriate ground water monitoring model to be used by the Commission to enforce its Water Use Permits issued to the Navy.*

The groundwater flow model and contaminant fate and transport model issue remains unresolved. In March 2022, DOH and EPA formally rejected the Navy's existing groundwater flow model (see memo and technical review dated 17 March 2022).

The Group supports the contention that the Navy’s existing groundwater model must be revised, as similar concerns have been echoed by experts across DOH, EPA, HBWS, USGS, and other organizations. The Commission could request regular progress updates on contaminant fate and transport model and support DOH established timelines for this.

The Group understands, however, that the plume migration may move faster than the pace of the model development which may take months to years. **The Commission should thus deploy the Precautionary Principle in decision-making because an uncharacterized hazard is not equivalent to “no hazard.” In other words, the absence of evidence is not evidence of the absence of contamination.**

Scope of work item: *1d) Review proposed expansion of monitoring network of wells at Red Hill and propose recommendations as appropriate.*

The NAVFAC Hawai‘i-led interagency Aquifer Recovery Working Group in collaboration with DOH, CWRM Commission staff, USGS, UH, various contractors, and other entities have identified sentinel well sites focusing on the area encompassing Red Hill and Hālawa shafts (Figure 1) centered on concerns about drinking water supplies. In April 2022, CWRM Commission staff approved well construction permits and remain attentive to the drilling process given legacy contamination in this heavily urbanized area.

Since April, a smaller Aquifer Recovery subject matter expert group, including CWRM Commission staff, has continued to meet weekly to strategize locations and conditions of proposed monitor wells. CWRM Commission staff continue to engage in interagency exchanges. **We recommend they remain attentive to issues of potential impacts to spring and other stream/coastal ecosystems and contaminant transport east toward Moanalua and consider monitoring strategies and partnerships to take advantage of monitoring opportunities beyond just wells that consider connectivity of surface and groundwater (i.e., chemistry and flow rates at springs and gaining reaches of streams).**

Scope of work item: *1a-iii) Recommend ways for the Commission to be fully represented at the decision-making table concerning the future of the Red Hill Fuel Bulk Storage Facility.*

The future of ~~RHBFSF~~ Red Hill Bulk Fuel Storage Facility has been determined at the federal level, and the process of the defueling is being monitored and regulated by DOH and EPA. The CWRM Commission can lend support to DOH and other state agencies by ensuring staff remain engaged and attentive to registration of new monitoring wells for surveillance in the region surrounding RHBFSF as well as future plans for use of water at the Red Hill Shaft.

## Establish permit requirements to ensure Navy accountability to the public.

Relevant scope of work items:

*1a-v) Ensure that agreed upon water-quality and ground water sampling is conducted by the Navy, and that all monitoring results and risks are shared quickly and transparently with the Commission, State Department of Health, and the Honolulu Board of Water Supply.*

*1a-vi) Any other issues related to current and future Navy applications for permits and water usage that address potential short and long-term impacts on the Pearl Harbor and Honolulu Aquifer.*

*1e) Identify financial and in-kind contributions the Navy can provide to the Ko‘olau Watershed Partnership that promote Aquifer recharge to offset groundwater system losses due to the presence or risk of contamination from the Red Hill Fuel Bulk Facility.*

**The Hawai‘i Department of Health-DOH** staff provided the following suggestions to the Group pertaining to the Navy’s water use permit modifications:

- 1. All state agencies are to be given full access to all data and information*
- 2. Water contingency plan – Navy to develop a water contingency plan that discusses what actions they take in the event of another spill, both to protect the aquifer and to ensure that surrounding aquifers are not over pumped to make up for the water that cannot be provided by the aquifers the Navy would normally pull from*
- 3. Watershed recharge/management plan – Similar to how water licensees have to come up with a watershed management plan to ensure that the watershed continues to produce water that they are consuming, the Navy should come up with one as well. This could take the form of monetary contributions to existing watershed partnerships, in proportion to the amount of water the Navy uses from the aquifer(s), or through actions they take.*
- 4. Actions consistent with the [Red Hill Shaft Recovery and Monitoring Plan](#) – this was previously developed and there are actions that could get further support.*

**Based on our analysis and the DOH recommendations, we propose the following conditions for the Navy’s three (3) water use permits in question.**

- **Demonstrate progress on remediation:** Show meaningful progress on remediation measures for existing contamination. This includes aiding remediation efforts for contamination that extends beyond Navy property.
- **Share water quality data:** All ground and surface water monitoring results and risks are shared with the Commission, ~~State Department of Health~~DOH, and the ~~Honolulu Board of Water Supply~~HBWS in a way that is transparent, complete, and timely.
- **Demonstrate progress on modeling:** Show meaningful and timely progress on groundwater and contaminant fate and transport modeling.

- **Develop contingency plans:** Develop and provide funding to implement a rapid-response aquifer recovery and remediation contingency plan in case of release during defueling.
- **Implement water shortage plan:** Navy must present and make meaningful progress on water conservation, recycling, and shortage actions to account for the impact to the aquifer. Near term, this entails reducing irrigation for landscaping and potentially imposing water restrictions on system users to reduce demand. There is some indication that the Navy has been able to maintain its pumping at Waiawa Shaft close to its 15 mgd water use allocation. Long term, this may require new infrastructure for stormwater capture and water reuse to reduce demand on potable groundwater for nonpotable uses; and installing metering and conducting annual water audits to improve system efficiency.
- **Demonstrate progress on the [Red Hill Shaft Recovery and Monitoring Plan \(RHSRMP\)](#),** especially related to the development and implementation of the Pearl Harbor Water Resources Management Plan (PHWRMP). The RHSRMP signed January 26, 2022 includes specific deliverables in Section 6: Water Resources Impact Offsets which states *“The overall goal of the PHWRMP will be to find at least 20 MGD in implementable water balance solutions in the areas of conservation, water reuse, enhanced recharge, source protection, and production capacity expansion. The output of the stakeholder-inclusive process will be an integrated priority list of projects in each area, ranked by factors such as beneficial volumetric, environmental, and community impacts; feasibility; implementation timeline; and cost.”* At the April 19 Commission meeting, Commissioner Joanna Seto and DOH Environmental Health head provided a progress update:
  - 1) The required [Beneficial Reuse Study](#) of GAC-treated water from Red Hill Shaft is wrapping up, but unfortunately the Navy contractor’s conclusion is that “a solution that made sense from a logistical and return-on-investment perspective could not be found.”
  - 2) The initial contractor award to develop the [Pearl Harbor Water Resources Management Plan](#) was made and the contractor was completing the initial draft Scope of Work with Plan of Action and Milestones (POAM) and submitting it to the Navy by the end of April; DOH expected to receive it shortly after.
- **Allocate funding to support the PHWRMP implementation.** This should include funding support for watershed management to offset water waste and environmental impact of contamination (see RHSRMP).
- **Conduct scientifically rigorous and transparent monitoring** of water chemistry and physical properties and biota at springs potentially affected directly by the contamination from [Red Hill RHBFSF](#) or indirectly through altered Navy pumping patterns (increased pumping at Waiawa), working in collaboration with local agencies/organizations. Numerous springs that support nearshore ecosystems and traditional and customary practices (lo‘i kalo, loko i‘a) in the Pu‘uloa region may be impacted directly and/or indirectly by this event.

b) Modification of other Water Use Permits including the **Honolulu Board of Water Supply HBWS**

Scope of work item: 1b) Recommend potential permit modifications and conditions for other Water Use Permits, including the Honolulu Board of Water Supply, to immediately deal with the current water crisis and contamination event at Red Hill.

At the March 15, 2022 meeting, the HBWS explained that they halted pumping at Hālawa shaft and nearby wells to protect their distribution system and customers from contaminants moving through the aquifer. HBWS also described their strategy for dealing with the water shortage induced by the loss of this important potable water source including both conservation measures but also the development of new sources in the Pearl (see [March 15, 2022 Submittal C1b](#) Red Hill Water Shortage Capital Response Projects). The early April suggestion of a [Governor’s emergency order to expedite permitting](#) briefly raised concerns that this could encourage water-grabbing in the Pearl Harbor Aquifer Sector Area and water users to bypass consideration of impacts to constitutionally-protected public trust purposes.

Expected water shortage for Honolulu Aquifer System Area: Given the Commission’s responsibilities to manage the health of the islands’ aquifers, altered pumping patterns must consider not only the contamination (best addressed by expertise within DOH, which has representation on the Commission), but also chlorides, especially in the fully allocated Honolulu Aquifer System Area. Demand is already high and expected to increase in the BWS Primary Urban Center (Figure 8). While the loss of Hālawa shaft is a challenge for the utility, increased pumping to offset the loss of 10-12 mgd could create new problems elsewhere that the Commission must anticipate and proactively consider.

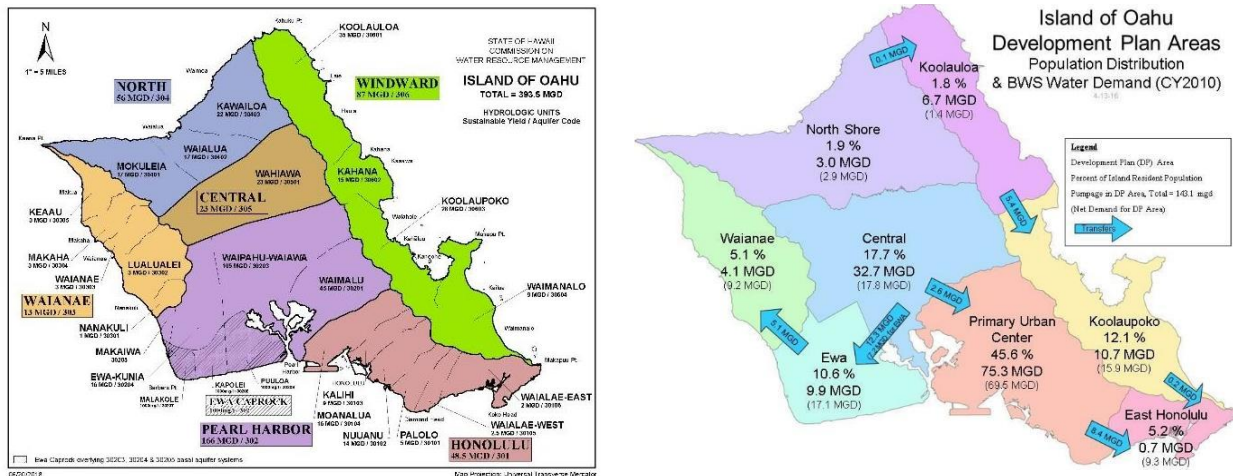


Figure 8: **CWRM**ommission hydrologic units (left) and HBWS water development areas for O‘ahu



**Establish requirements, associated *either* with Water Shortage Plans, water use permits, or another mechanism, to ensure water use permit holders and especially largest water users HBWS and Navy play an active role in protection of O‘ahu’s aquifers and waters.**

- 1) Timely and transparent data sharing of pumpage rates, groundwater levels, and chlorides at available wells and/or index wells, or [CWRM Commission](#) staff access for independent sampling.
- 2) Transparent and advance communication on water conservation, and water shortage trigger status and actions initiated by the water utilities.
- 3) Access to not only existing wells, but also springs, streams, and other locations in the region that have the potential to serve as sentinel sites for contamination or groundwater depletion.

**c) Determine existence of water shortage in the Pearl Harbor aquifer sector or Honolulu aquifer sector and necessary [CWRM Commission](#) action.**

Scope of work item: 1c) *Investigate whether a water shortage exists in the Pearl Harbor aquifer sector area or Honolulu aquifer sector area pursuant to HRS §174C-62, and whether the Pearl Harbor Water Shortage Plan is activated and should be followed.*

In response to the contamination at Red Hill Shaft and underlying aquifer, ~~the Honolulu Board of Water Supply (HBWS)~~ took the precaution of shutting down three of its nearby water sources (Hālawa Shaft, ‘Aiea Well, and Hālawa Well) to avoid uptake of contaminants into its distribution system. Even five months after the event, the contaminant plume remains poorly characterized and groundwater and contaminant fate and transport modeling by the Navy remains insufficient; the model proposed in 2020 was recently rejected by the ~~Hawai‘i Department of Health DOH~~ and the ~~US Environmental Protection Agency EPA~~ (See [EPA/DOH memo and technical report 3/17/2022](#)). In a recent meeting of the Aquifer Recovery Focus Group, it was shared that data from the new groundwater monitoring wells might not be available until late July/August 2022.

The HBWS wells have a combined water use permit allocation of 13.7 million gallons per day (mgd) supplying water to the HBWS metro water system. The HBWS has developed an emergency response strategy to address the loss of its three sources, including reducing customer demands, increasing use of its other sources, monitoring, and new source development (see [March 15, 2022 HBWS submittal C1b](#) Red Hill Water Shortage Capital Response Projects). Increasing HBWS withdrawals may have implications for water use permits and withdrawals in the Pearl Harbor and already over-allocated/over-pumped aquifer sectors of the Honolulu aquifer.

The three Navy system wells have a combined water use permit allocation of 20.3 mgd. At present, the contaminated Red Hill Shaft is being pumped at around 5 mgd for treatment and discharge to Hālawa Stream and the ‘Aiea-Hālawa Well remains offline (see [minutes from 15 March 2022 CWRM meeting](#)). Thus, the Navy system demand now relies wholly on Waiawa Shaft (allocation of 14.97 mgd).

The contaminant-associated disruption to operations of both HBWS and Navy water systems necessitates changes in pumping patterns across the aquifer sector areas due to the loss of nearly 20 mgd of previously potable groundwater water. The impacts and duration of this disruption have yet to be determined. Commissioners might expect to face challenges implementing and enforcing water shortage measures extending to all water users within the affected aquifer sector areas.

~~CWRM~~ommission staff continue to investigate the potential for water shortage in the Pearl Harbor and Honolulu aquifer sectors by tracking:

- 1) Groundwater elevations at monitoring wells (key trigger);
- 2) Reported groundwater pumpage from water use permit holders; and
- 3) Groundwater chloride concentrations.

~~CWRM~~ommission staff shared that reporting lags can sometimes be excessive, up to 6 months. Relatedly, changes to groundwater elevations may be slow; midpoint and transition zones changes at deep monitoring wells lag changes in pumping and rainfall by several months. These indicators may not be the most sensitive or appropriate indicators of potential problems. Staff are currently working to improve timeliness of interagency reporting and data-sharing.

#### **Pearl Harbor Aquifer Sector Area: Currently no water shortage based on existing criteria and available data**

The preliminary assessment by ~~CWRM~~ommission staff based on the current Pearl Harbor Water Shortage Plan (PHWSP) and available data is that the existing criteria for declaring a water shortage **have not been met** (see Exhibit 3). However, water levels appear to be getting close to the first trigger level of -1 standard deviations and therefore need to be closely monitored (Table 1 below). While no water shortage currently exists in the Pearl Harbor Aquifer Sector, the Commission and ~~Honolulu~~-BWS are already taking actions consistent with Stage 1: Water Shortage Watch, including a call for water conservation, coordination meetings, and staff will begin to increase data collection frequency. ~~The Honolulu~~-BWS has begun an aggressive water conservation campaign.

While there is no hazardous material release/contamination trigger in the current PHWSP, ~~CWRM~~ommission Planning Branch staff are working with DOH to develop a process for incorporating contamination triggers. This is important because although the de facto yield of the Waimalu aquifer, for example, was effectively reduced by the contamination event and subsequent shut-off of a number of wells to halt/pre-empt a public health hazard. This scenario is not part of a chloride-based “sustainable yield,” where the relatively easy remedy is to reduce, but not halt pumping. In this case, water resources have been rendered unusable for an indefinite period of time until 1) water treatment options allow this groundwater to be used for non-potable and/or potable purposes or 2) in situ aquifer remediation is accomplished that allows this water to be safely consumed.

1) Groundwater elevations remain above the **CWRM Commission** Stage 1 trigger and HBWS Caution trigger (Tables 1 and 2 below)

Aquifer System Area	Monitor Well	Water Level (feet above mean sea level = ft, msl)	Date of Measurement	Prior Water Level (ft, msl)	Date of Measurement	Prior Negative 1 Standard Deviation from Mean (ft, msl)
Makaīwa	None	NA	NA	NA	NA	NA
'Ewa-Kunia	Kunia Mauka 2	21.58' msl	5/11/2022	21.14' msl	12/28/2021	20.40' msl
	Kunia Middle	15.90' msl	5/11/2022	15.79' msl	12/28/2021	15.29' msl
Waipahu-Waiawa	Waipi'o Mauka	20.29' msl	5/12/2022	19.81' msl	12/28/2021	19.67' msl
	Waipahu	17.82' msl	4/19/2022	17.38' msl	8/2/2021	16.61' msl
Waimalu	Waimalu	19.67' msl	5/12/2022	19.00' msl	12/10/2021	18.13' msl
	Hālawa	19.69' msl	5/11/2022	19.95' msl	12/10/2021	16.90' msl

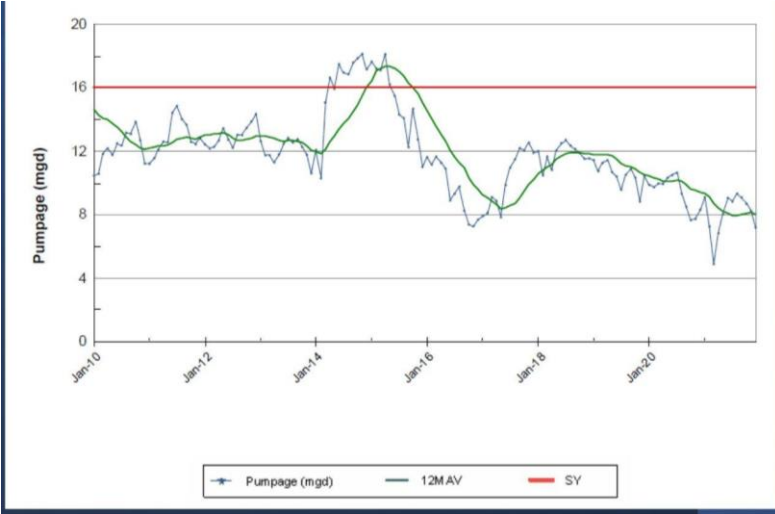
Table 1. Currently available groundwater elevation data from the Commission's monitor wells in Pearl Harbor hydrologic unit and Stage 1 (Water Shortage Watch) trigger.

Aquifer System Area	Monitor Well	Water Level (ft., msl)	Date of measurement	Low Ground Water Level: Caution
Makaiwa	None	N/A	N/A	N/A
Ewa-Kunia	Hoaeae-Kunia	18.56	3/1/2022	13.00
Waipahu-Waiawa	Waipahu	17.91	3/1/2022	17.00
	Pearl City	14.53	3/7/2022	14.00
Waimalu	Kalauao	16.89	3/3/2022	15.50
	Hālawa	16.84	3/6/2022	15.50

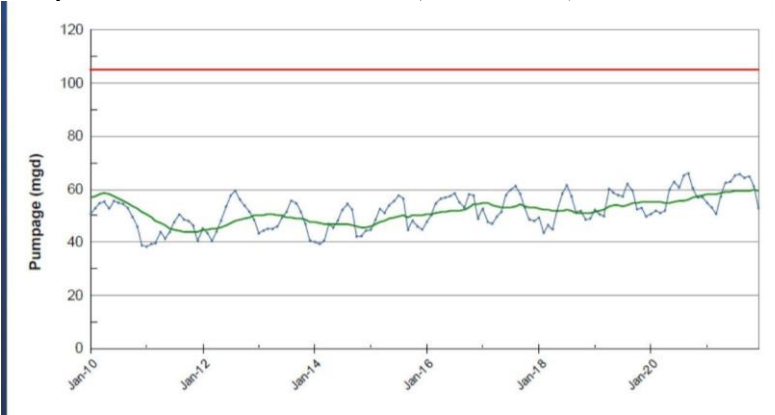
Table 2. Groundwater elevation data from the HBWS index wells in Pearl Harbor hydrologic unit and Low Groundwater Level: Caution trigger.

2) Current withdrawals remain within chloride-defined sustainable yield (SY)

‘Ewa-Kunia Withdrawals (12/31/2021)



Waipahu-Waiawa Withdrawals (12/31/2021)



Waimalu Withdrawals (12/31/2021)



Figure 9. Total pumping by multiple users in the Pearl Harbor aquifer sector area

- 3) Chlorides from numerous wells in the area indicate chlorides are mostly stable or even decreasing. The exception to this is wells in Punanani (Waimalu, upward trend since 2020) and Waipahu (upward trend since 2017). Staff are currently analyzing chloride data.

Honolulu Aquifer Sector Area: Honolulu water shortage situation/plan still being determined. Timely reporting from all permitted users is requested

At present there is no existing Honolulu Aquifer Sector Area Water Shortage Plan (Honolulu WSP), so staff have been developing a provisional plan. One challenge to this matter is that ~~the CWRM Commission~~ does not have its own monitoring wells in Honolulu Aquifer; staff rely fully on HBWS for information on the status of its wells in the Honolulu Aquifer Sector. Working closely and in coordination with HBWS is also necessary because HBWS makes up over 80% of the permitted allocations and actual use in this water management unit. Commission staff have completed the following tasks:

- Reviewed all groundwater use permits in the Honolulu Aquifer Sector Area (~~A~~ASEA)
- Sent letters to water use permit holders requesting their individual water shortage plan
- Received a briefing by the ~~Honolulu Board of Water Supply (HBWS)~~ on their ongoing effort to create a water shortage plan
- Met internally to discuss potential triggers for stages of water shortage
- Considering triggers: HBWS index well water levels/Low Groundwater Level Conditions; withdrawals (pumpage)
- Met with HEER Office/~~Hawai'i Department of Health~~DOH on hazardous substance release triggers
- Draft outline of provisional plan

Commission staff have compiled groundwater elevation data (Table 3) and withdrawal/pumpage data (Table 4) to aid their assessment. Key conclusions are indicated below. Chloride data are not available at this time.

1) Groundwater elevations have dropped **to or** below the HBWS Low Ground Water Level: Caution trigger at -Nu‘uanu and Pālolo index wells.

Aquifer System Area	Monitor Well	Water Level (ft., msl)	Date of measurement	Low Ground Water Level: Caution
Moanalua	Moanalua	19.31	2/28/2022	18.50
Kalihi	Kalihi	21.82	2/28/2022	20.50
Nu‘uanu	Beretania	21.00	2/28/2022	21.00
Pālolo	Kaimuki	23.19	3/1/2022	23.50
Wai‘alae West	None	N/A	N/A	N/A
Wai‘alae East	None	N/A	N/A	N/A

Table 3. Groundwater elevation data from the HBWS index wells in Honolulu hydrologic unit and Low Groundwater Level: Caution trigger.

2) Users exceeding permitted allocations and sustainable yield in Nu‘uanu (12- month moving average as of Dec 2021); Pālolo is over-allocated

Aquifer System	SY	WUP Holder	Allocation	Wells	Dec 2021 12-Mav	Allocation minus water use	Remaining SY	
Kalihi	9	BWS	1.5	3-2052-013	1.277	0.223	7.471	
				3-2052-014	0			
			6.948	3-1952-006	0	6.948		
				3-1952-007	0			
				3-1952-008	0			
				3-1952-016	0			
				3-1952-017	0			
				3-1952-018	0			
				3-1952-019	0			
				3-1952-022	0			
				Kamehameha Schools	0.229	3-2051-001		0
	3-2051-002	0.162						
O‘ahu Country Club	0.06	Pālama Settlement	3-2050-001	0.09	-0.03			
			3-1952-015	0	0.039			
Moanalua	16	BWS	3.79	3-2153-010	1.424	2.366	9.082	
				3-2153-011	0			
				3-2153-012	0			
			Honolulu Country Club	0.346	3-2154-001	0.332		0.014
			Navy	4.659	3-2254-001	4.714		-0.055

		Army	1.035	3-2053-011	0.448	0.587	
				3-2053-013	NRU		
Nu'uuanu	14	BWS	7	3-1849-013	7.622	<b>-0.622</b>	<b>-1.874</b>
				3-1849-014	0		
				3-1849-015	0		
				3-1849-016	0		
			0.7	3-1948-001	0.744	<b>-0.044</b>	
			7	3-1851-012	7.011	<b>-0.011</b>	
				3-1851-013	0		
				3-1851-031	0		
				3-1851-033	0		
				3-1851-034	0		
				3-1851-035	0		
				3-1851-067	0		
				3-1851-074	0		
				3-1851-075	0		
		Pacific Club	0.04	3-1851-007	0.01	0.03	
		Queens Medical Center	0.237	3-1851-054	0.25	<b>-0.013</b>	
		Kawaiaha'o Church	0.03	3-1851-073	0.056	<b>-0.026</b>	
		Punahou School	0.158	3-1849-010	0.181	<b>-0.023</b>	
Pālolo	5	BWS	4	3-1748-003	3.825	0.175	<b>-0.309</b>
				3-1748-004	0		
				3-1748-005	0		
				3-1748-006	0		
				3-1748-007	0		
				3-1748-008	0		
				3-1748-009	0		
				3-1748-010	0		
			1.31	3-1847-001	1.181	0.129	
		Kyo-Ya	0.336	3-1749-019	0.303	0.033	
Wai'alae East	2	BWS	0.19	3-1746-002	0	0.19	1.865
			0.3	3-1843-001	0.008	0.292	
			0.3	3-1745-001	0.127	0.173	
Wai'alae West	2	BWS	0.48	3-1746-001	0.042	0.438	0.966
			0.16	3-1747-005	0.676	<b>-0.516</b>	
		Kamehameha Schools	0.46	3-1646-001	0.316	0.144	

Table 4. Pumping by various water users in the Honolulu -aquifer sector area. Text in bold/red indicates exceedance of allocation/sustainable yield.

3) Chlorides not available at this time.

#### Next steps

Staff have identified the following next steps:

- Follow-up with individual water shortage plans

- Specify triggers and actions
- Develop draft Provisional Honolulu WSP
- Meet with ~~Honolulu~~-HBWS and other groundwater use permit holders to discuss draft Honolulu WSP
- Abbreviated public outreach
- Staff coordinating with HWBS to measure water levels and collect data in Honolulu ASEA
- Staff looking at other non-HBWS monitor wells
- Staff will evaluate HBWS deep monitor well time series data to better understand aquifer conditions
- Briefing/Submittal for adoption to Commission

The Group supports ~~CWRM~~Commission staff efforts to improve reporting and data sharing with HBWS. This would enable better interagency coordination to address the water shortage issues of both Honolulu and Pearl Harbor aquifer sectors and ensure conservation measures by all permitted water users. It is important to note that Honolulu and Pearl Harbor water resources are linked primarily through the HBWS distribution systems; the Pearl Harbor aquifer supports water demands of urban Honolulu. While the neighboring aquifer systems of Waimalu (Pearl Harbor hydrologic unit) and Moanalua (Honolulu hydrologic unit) are also hydrologically connected, from a water management perspective, it is the distribution system spanning these two units that requires a more holistic and parallel/combined assessment of the water shortage situation.

Given the below-average rainfall for the 2021-2022 winter and thus lower than expected recharge coupled with the suspension of pumping at Hālawā shaft (Pearl Harbor aquifer) and infrastructure upgrades/offline wells, HBWS announced voluntary conservation measures in March 2022 (see [3/10/2022 news release](#)). Although HBWS is the single biggest withdrawer of water from the aquifer, the Group believes **all permittees** must participate in water conservation for the upcoming dry season, and the Commission has the authority to declare a water shortage to effect this. We note the Commission's responsibility is to consider water resources as a whole, considering entities affected by the Red Hill event, extending beyond permitted users and inclusive of public trust purposes. The water shortage planning process is forcing much-needed interagency exchange on the fully or over-allocated aquifers of Pearl Harbor and Honolulu which also aids the CWRM's climate-readiness given projected climate change-linked rainfall and recharge declines for this region and implications for sustainable yield (SY).

## Ongoing efforts at Deputy and staff level

Scope of work items:

*1f) Identify additional staff positions needed by CWRM to monitor and mitigate impacts of the ~~RHBFSF Red Hill Fuel Bulk Facility~~ and seek commensurate funding from the Navy.*

*1g) Review the legal options the Commission can pursue*



## RECOMMENDATIONS

**1) Modify the Navy's three water use permits with special conditions to require the development of a comprehensive aquifer remediation and recovery plan that includes implementation schedules, responsible agencies, and funding requirements.** Primary authors for such a plan should include the ~~Hawaii~~-~~Commission-on-Water-Resource-Management~~, ~~Hawai'i~~ ~~Department of Health~~DOH, and the ~~Federal~~US Department of Defense, and ~~the US~~ ~~Environmental Protection Agency~~PA. This plan should build upon and support current planning efforts such as the existing Red Hill Shaft Recovery and Monitoring Plan, the Pearl Harbor Water Resources Management Plan, the recently configured Remediation and Restoration ~~on~~ve Action Plan Committee, and relevant Emergency Orders and directives from the ~~State~~ ~~Department of Health~~DOH. Areas to be addressed in the plan should include:

- g) **Remediation progress:** Demonstrated progress on remediation measures for existing contamination. This includes aiding remediation efforts for contamination that extends beyond Navy property;
- h) **Water quality data sharing:** All ground and surface water monitoring results and risks are shared with the ~~Hawai'i~~-~~Commission-on-Water-Resource-Management~~, ~~State~~ ~~Department of Health~~DOH, and the ~~Honolulu~~ ~~Board of Water Supply~~HBWS in a way that is transparent, complete, and timely;
- i) **Modeling progress:** Demonstrated progress on groundwater and contaminant fate and transport modeling;
- j) **Contingency plans:** Development of and funding to implement an immediate aquifer recovery and remediation contingency plans in case of release during defueling;
- k) **Water shortage plan implementation:** Navy must regularly present and make meaningful progress on water conservation, recycling, and shortage actions to account for their impact on the aquifer.
- l) **Sampling and monitoring** of water chemistry and physical properties and biota at spring-fed sites potentially affected directly by the contamination from Red Hill or indirectly through altered Navy pumping patterns.

**2) Initiate a ~~Water~~-Commission process to modify the three NAVFAC Hawai'i Water Use Permits and permits of other Pearl Harbor and Honolulu Aquifer System water users as appropriate for managing the anticipated water shortages.**

Because there is no process set forth in the Water Code (HRS 174C) or rules (HAR 13-171) for Commission-initiated permit modifications, the modifications would need to follow the same process that is set out in the rules for a new permit (HAR 13-171-12 through 13-171-22), requiring public notice and public hearing. We suggest the ~~CWRM~~ommission deputy and deputy attorney general are best qualified to propose a timeline for the ~~CWRM~~ommission-initiated permit modification process for the Navy and other water use permit holders as appropriate.

**3) Ensure, with Commission action if necessary, that existing policies to address water shortages can be utilized and effectively and equitably enforced to address the anticipated**

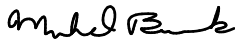
water shortages and/or water emergency resulting from aquifer contamination. Such policies, in addition to addressing water use permit holders, must also consider the broader scope of the public trust, including protection of traditional and customary rights and practices associated with numerous fresh and brackish springs of the Pu‘uloa/Pearl Harbor region.

Timeline:

**May 17:** Group presents recommendations to full Commission for review and discussion as an informational briefing.

**June 14:** Group presents revised recommendations based on May 17 discussion. Full Commission deliberates and considers action.

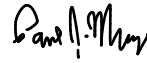
Respectfully submitted,



Mr. Michael G. Buck



Dr. Aurora Kagawa-Viviani



Mr. Paul J. Meyer

- Exhibits:
1. Permitted Interaction Group Scope of Work
  2. Legal Authority
  3. Pearl Harbor Water Shortage Plan
  4. Key Documents and References

### Exhibit 1: Permitted Interaction Group Scope of Work

The ~~Advisory~~ Group's initial scope of work scope was proposed in Staff submittal Item B1, Item 1 on page 5, as amended (bold text below) and approved in the Jan 7, 2022 minutes is as follows:

- a) Recommend potential permit modifications and conditions for the NAVFAC Hawai'i Water Use Permits, including but not limited to:
  - i) A required implementation schedule, monitoring protocol, and enforcement of the Drinking Water Sampling Plan approved by the ~~Department of Health~~ DOH.
  - ii) Determine the appropriate groundwater monitoring model to be used by the Commission to enforce its Water Use Permits issued to the Navy.
  - iii) Recommend ways for the Commission to be fully represented at the decision-making table concerning the future of the ~~Red Hill Fuel Bulk Storage Facility~~ RHBFSF.
  - iv) Suggest how the Commission can assist in public disclosure of the status of the ~~Red Hill Facility~~ RHBFSF, including the progress of Navy actions to defuel its petroleum fuel storage tanks, with attendance by informed Navy officials at future ~~Water~~ Commission meetings.
  - v) Ensure that agreed upon water-quality and ground water sampling is conducted by the Navy, and that all monitoring results and risks are shared quickly and transparently with the Commission, ~~State Department of Health~~ DOH, and the ~~Honolulu Board of Water Supply~~ HBWS.
  - vi) Any other issues related to current and future Navy applications for permits and water usage that address potential short and long-term impacts on the Pearl Harbor and Honolulu Aquifer.
- b) Recommend potential permit modifications and conditions for other Water Use Permits, including the ~~Honolulu Board of Water Supply~~ HBWS, to immediately deal with the current water crisis and contamination event at Red Hill.
- c) Investigate whether a water shortage exists in the Pearl Harbor aquifer sector area or Honolulu aquifer sector area pursuant to HRS §174C-62, and whether the Pearl Harbor Water Shortage Plan is activated and should be followed.
- d) Review proposed expansion of monitoring network of wells at ~~Red Hill~~ RHBFSF and propose recommendations as appropriate.
- e) Identify financial and in-kind contributions the Navy can provide to the Ko'olau Watershed Partnership that promote Aquifer recharge to offset groundwater system losses due to the presence or risk of contamination from the ~~Red Hill Fuel Bulk Facility~~ RHBFSF.
- f) Identify additional staff positions needed by the CWRM Commission to monitor and mitigate impacts of the ~~Red Hill Fuel Bulk Facility~~ RHBFSF and seek commensurate funding from the Navy.
- g) Review the legal options the Commission can pursue

**Exhibit 2: Legal Authority: Constitution, Water Code (HRS 174C), Public Agency Meetings and Records (HRS 92) and Administrative Rules (HAR §13-171)**

**Hawai'i Constitution Article 11, Section 7**

The State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people.

The legislature shall provide for a water resources agency which, as provided by law, shall set overall water conservation, quality and use policies; define beneficial and reasonable uses; protect ground and surface water resources, watersheds and natural stream environments; establish criteria for water use priorities while assuring appurtenant rights and existing correlative and riparian uses and establish procedures for regulating all uses of Hawaii's water resources.

**Hawai'i Revised Statutes §174C,**

**State Water Code**

*The Commission's legal authority is stated clearly in the Water Code. The Group, in review of the State Water Code, believes the Commission has unique and robust regulatory powers to protect the waters of Hawai'i. The fuel releases at the ~~RHBFSF~~**Red Hill Bulk Fuel Storage Facility** require the Commission to exercise its full authority and fiduciary responsibility to protect O'ahu's most important drinking water source from further contamination.*

**§174C-2 Declaration of policy.**

(a) It is recognized that the waters of the State are held for the benefit of the citizens of the State. It is declared that the people of the State are beneficiaries and have a right to have the waters protected for their use.

(d) The state water code shall be liberally interpreted to protect and improve the quality of waters of the State and to provide that no substance be discharged into such waters without first receiving the necessary treatment or other corrective action. The people of Hawaii have a substantial interest in the prevention, abatement, and control of both new and existing water pollution and in the maintenance of high standards of water quality.

**§174C-5 General powers and duties.** The general administration of the state water code shall rest with the commission on water resource management. In addition to its other powers and duties, the commission:

- (12) Shall provide coordination, cooperation, or approval necessary to the effectuation of any plan or project of the federal government in connection with or concerning the waters of the State. The commission shall approve or disapprove any federal plans or projects on behalf of the State. No other agency or department of the State shall assume the duties delegated to the commission under this paragraph, except that the department of health shall continue to exercise the powers vested in it with respect to water quality, and except that the department of business, economic development, and tourism shall continue to carry out its duties and responsibilities under chapter 205A;

**§174C-10] Dispute resolution.** The commission shall have jurisdiction statewide to hear any dispute regarding water resource protection, water permits, or constitutionally protected water interests, or where there is insufficient water to meet competing needs for water, whether or not the area involved has been designated as a water management area under this chapter. The final decision on any matter shall be made by the commission.

**[§174C-62] Declaration of water shortage.**

(a) The commission shall formulate a plan for implementation during periods of water shortage. As a part of the plan, the commission shall adopt a reasonable system of permit classification according to source of water supply, method of extraction or diversion, use of water, or a combination thereof.

(b) The commission, by rule, may declare that a water shortage exists within all or part of an area when insufficient water is available to meet the requirements of the permit system or when conditions are such as to require a temporary reduction in total water use within the area to protect water resources from serious harm. The commission shall publish a set of criteria for determining when a water shortage exists.

(c) In accordance with the plan adopted under subsection(a), the commission may impose such restrictions on one or more classes of permits as may be necessary to protect the water resources of the area from serious harm and to restore them to their previous condition.

(d) A declaration of water shortage and any measures adopted pursuant thereto may be rescinded by rule by the commission.

(e) When a water shortage is declared, the commission shall cause a notice thereof to be published in a prominent place in a newspaper of general circulation throughout the area. The notice shall be published each day for the first week of the shortage and once a week thereafter until the declaration is rescinded. Publication of such notice shall serve as notice to all water users in the area of the condition of water shortage.

(f) The commission shall cause each permittee in the area to be notified by regular mail of any change in the conditions of the permittee's permit, any suspension thereof, or of any other restriction on the use of water for the duration of the water shortage.

(g) If an emergency condition arises due to a water shortage within any area, whether within or outside of a water management area, and if the commission finds that the restrictions imposed under subsection (c) are not sufficient to protect the public health, safety, or welfare, or the health of animals, fish, or aquatic life, or a public water supply, or recreational, municipal, agricultural, or other reasonable uses, the commission may issue orders reciting the existence of such an emergency and requiring that such actions as the commission deems necessary to meet the emergency be taken, including but not limited to apportioning, rotating, limiting, or prohibiting the use of the water resources of the area. Any party to whom an emergency order is directed may challenge such an order but shall immediately comply with the order, pending disposition of the party's challenge. The commission shall give precedence to a hearing on such challenge over all other pending matters.

[Hawai'i Revised Statutes §92-2.5, -](#)

Permitted interactions of members

(b) Two or more members of a board, but less than the number of members which would constitute a quorum for the board, may be assigned to:

- (1) Investigate a matter relating to the official business of their board; provided that:
- (A) The scope of the investigation and the scope of each member’s authority are defined at a meeting of the board; ~~[(Jan 7, 2022 Commission meeting)]~~
  - (B) All resulting findings and recommendations are presented to the board at a meeting of the board; ~~[(Feb 15 and May 17, 2022 (agenda) Commission meetings)]~~ and
  - (C) Deliberation and decision-making on the matter investigated, if any, occurs only at a duly noticed meeting of the board held subsequent to the meeting at which the findings and recommendations of the investigation were presented to the board; ~~[(June 14 (agenda) meeting)]~~ or
- (2) Present, discuss, or negotiate any position which the board has adopted at a meeting of the board; provided that the assignment is made and the scope of each member’s authority is defined at a meeting of the board prior to the presentation, discussion, or negotiation.

(e) Two or more members of a board, but less than the number of members which would constitute a quorum for the board, may attend an informational meeting or presentation on matters relating to official board business, including a meeting of another entity, legislative hearing, convention, seminar, or community meeting; provided that the meeting or presentation is not specifically and exclusively organized for or directed toward members of the board. The board members in attendance may participate in discussions, including discussions among themselves; provided that the discussions occur during and as part of the informational meeting or presentation; and provided further that no commitment relating to a vote on the matter is made or sought.

At the next duly noticed meeting of the board, the board members shall report their attendance and the matters presented and discussed that related to official board business at the informational meeting or presentation.

~~(h) Communications, interactions, discussions, investigations, and presentations described in this section are not meetings for purposes of this part. [L 1996, c 267, §2; am L 2005, c 84, §1; am L 2012, c 177, §1]~~

Hawai’i Administrative Rules Title 13, Chapter 171,

***Designation and regulation of water management areas***

**§13-171-13 Conditions for a water use permit.** (a) To obtain a permit pursuant to this part, the applicant shall establish that the proposed use of water:

- (1) Can be accommodated with the available water source;
- (2) Is a reasonable-beneficial use as defined in section 13-171-2;
- (3) Will not interfere with any existing legal use of water;
- (4) Is consistent with the public interest; .....

**§13-171-22 Review of water use permit.** (a) The commission shall retain and continue to have jurisdiction for the purpose of reviewing and modifying every permit as may be necessary in fulfillment of its duties and obligations under this code.

**§13-171-23 Modification of water use permit.** (a) A permittee may seek modification of any term of a permit. A permittee who seeks to change the use of water subject to the permit, whether or not such change in use is of a material nature, or to change the place of use of the water or to use a greater quantity of water than allowed under the permit or to make any change in respect to the water which may have a material effect upon any person or upon the water resources, shall make application for such modification pursuant to section 13-171-12. Modification of one aspect or condition of a permit may be conditioned on the permittee's acceptance of changes in other aspects of the permit.

(b) All permit modification applications shall be treated as initial permit applications and be subject to sections 13-171-12 to 13-171-22; except that if the proposed modification involves an increase in the quantity of water not exceeding an average amount per month as set forth in section 13-171-14, the commission, at its discretion, may approve the proposed modification without a hearing provided that the permittee establishes that:

(1) A change in conditions has resulted in the water allowed under the permit becoming inadequate for the permittee's needs; or

(2) The proposed modification would result in a more efficient utilization of water than is possible under the existing permit.

(c) County agencies are exempt from the requirements of this section except where the modification involves a change in the quantity of water to be used or where the new use would adversely affect the quality of the water or quantity of use of another permittee. [Eff. MAY 27 1988] (Auth: HRS §174C-8) (Imp: HRS §§174C-5, 174C-57)

**Exhibit 3: Pearl Harbor Water Shortage Plan (Aug 2020)**

Table 5. Water shortage stages, triggers, and actions. Source: <https://files.hawaii.gov/dlnr/cwrm/submittal/2020/sb20200818C1.pdf>



Stage	Trigger(s)	Action(s)
<b>Stage 1: Water Shortage Watch</b>	<ul style="list-style-type: none"> <li>• USDA (United States Department of Agriculture) Secretarial Drought Designation for the county containing ASA; or</li> <li>• -1 standard deviation from average water levels in one or more CWRM DMWs in an ASA for 2 quarterly measurements.</li> </ul>	<ul style="list-style-type: none"> <li>• Joint call for water conservation via press release with BWS; and</li> <li>• Begin regular coordination with BWS, DOH and other large water purveyors and partners on data and messaging; and</li> <li>• CWRM to begin increased data collection including more frequent DMW (deep monitoring well) monitoring from quarterly to monthly and following up with non-compliant reporters.</li> </ul>
<b>Stage 2: Water Shortage Alert</b>	<ul style="list-style-type: none"> <li>• -2 standard deviations from average water levels in one or more CWRM DMWs for 3 monthly measurements; or</li> <li>• BWS Declaration of low groundwater conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• WUP holders in the affected ASA to begin implementing their individual water shortage plans; and</li> <li>• CWRM staff to begin emergency rulemaking process to declare a water shortage; and</li> <li>• Continued coordination with entities identified in the water shortage watch stage; and</li> <li>• Continue monthly monitoring of CWRM DMWs; and</li> <li>• Enforcement of the water use reporting requirement.</li> </ul>
<b>Stage 3: Water Shortage Warning</b>	<ul style="list-style-type: none"> <li>• -3 standard deviations from average water levels in one or more CWRM DMWs in an ASA for 2 monthly measurements.</li> </ul>	<ul style="list-style-type: none"> <li>• CWRM to complete emergency rulemaking process to declare a water shortage; and</li> <li>• CWRM to require permit holders to reduce their pumpage according to the regional water shortage plan permit classification scheme (Table 6) based on the permit holders last reported monthly pumpage prior to the Stage 2 Water Shortage being declared; and</li> <li>• Continued coordination with entities identified in the water shortage watch stage; and</li> <li>• Continued enforcement of water use reporting requirement; and</li> <li>• Continue monthly monitoring of CWRM DMWs.</li> </ul>



#### Exhibit 4: Key Documents and References

Items are ordered chronologically and thematically.

1. DOH Hearing Officer Final Decision, Order, Findings of Fact, and Conclusions of Law (3-Jan 2022) <https://health.hawaii.gov/about/files/2022/01/Final-Decision-Docket-No.-21-UST-EA-02.pdf>.
2. Drinking Water Sampling Plan (Dec 2021) <https://www.cpf.navy.mil/Portals/52/Joint-Drinking-Water-Sampling-Plan-FINAL.pdf>.
3. Red Hill Shaft Recovery and Monitoring Plan (RHSRMP, 26 Jan 2022) <https://health.hawaii.gov/about/files/2022/01/Final-Signed-Red-Hill-Shaft-Recovery-and-Monitoring-Plan-20220126.pdf>.
4. Groundwater:
  - a. Groundwater flow model report (26 March 2020) <https://www.epa.gov/sites/default/files/2020-04/documents/red-hill-groundwater-flow-model-report-redacted-2020-03-25-.pdf>.
  - b. Groundwater Model Progress Update (5 April 2020) .
  - c. EPA and DoH memo and technical review rejecting Navy Groundwater flow model (17 March, 2022) <https://www.epa.gov/system/files/documents/2022-03/epa-hdoh-groundwater-flow-model-report-disapproval-with-attachments-2022-03-17.pdf>.
5. Initial Release Response Report, Fire Suppression Drain Line, Red Hill Bulk Fuel Storage Facility (3 March 2022) <https://health.hawaii.gov/ust/files/2022/03/2022-03-07-Initial-RRR-Fire-Suppression-Release-long-ver-1.pdf>.
6. Emergency Order Docket No. 22-UST-EA-01 Re: Emergency Change-In-Service, Defueling, and Closure of 20 Underground Storage Tanks, Surge Tanks, and Associated Piping, Red Hill Bulk Fuel Storage Facility (6 May 2022) <https://health.hawaii.gov/about/files/2022/05/DOH-Emergency-Order-Final-May-6-2022.pdf>.