ACTION MEMORANDUM

Off-Base Private Drinking Water Time-Critical Removal Action for Enduring Solutions, near Naval Base Kitsap-Bangor, Silverdale, Washington

PREPARED BY: Naval Facilities Engineering Systems Command (NAVFAC) Northwest

DATE: March 2025

1.0 Purpose

The purpose of this Action Memorandum (AM) is to document the selected enduring solutions to address specific per- and polyfluoroalkyl substances (PFAS) above the Department of Defense (DoD)'s Interim Action Levels (DoD, 2024) in four private drinking water wells near Naval Base Kitsap (NBK)-Bangor (Bangor) in Silverdale, Washington. These properties and associated wells are referred to as Resident 3, Resident 4, Resident 5, and Resident 6.

The U.S. Navy is implementing a Time Critical Removal Action (TCRA) at these four properties near NBK-Bangor to provide the residents with a long-term solution for drinking water. The TCRA is intended to select the most protective, enduring, and cost-effective solution to provide a drinking water source. This TCRA is to connect the affected properties to the Silverdale Water District (SWD) water supply.

This AM was prepared per Subsections 300.415 (n)(2) of Title 40 of *Code of Federal Regulations*, as part of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Navy is the lead agency, under Executive Order 12580, for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) action at NBK-Bangor. NBK-Bangor is currently listed on the U.S. Environmental Protection Agency (EPA) National Priorities List.

2.0 Site Conditions and Background

Naval activities began at NBK-Bangor when the U.S. Naval Magazine Bangor was established to provide a deep-water shipment facility for ordnance. From 1944 into the early 1970s, the Navy facility at Bangor was primarily used for shipment and storage of ordnance and demilitarization of unserviceable and dangerous ammunition. In February 1977, NBK-Bangor was commissioned as the West Coast homeport for the Trident Submarine Launched Ballistic Missile System. NBK-Bangor's current mission is to provide administrative and personnel support for submarine force operations and logistical support for other Navy activities (CH2M, 2020). The most common activity associated with a historical release of PFAS to the environment at NBK-Bangor is the use of firefighting foam—specifically, aqueous film-forming foam, or AFFF—for testing, training, firefighting, and other life-saving emergency responses or associated disposal practices.

In 2016, the Deputy Assistant Secretary of the Navy (Environment) issued a memorandum to address past releases of PFAS, under the Navy Environmental Restoration Program (Navy, 2016). This memorandum authorized the Navy to mitigate exposure in private drinking water wells with PFOA and/or PFOS above 70 parts per trillion (ppt), individually or combined, as a result of past Navy operations. In response to the 2016 memorandum, the Navy assessed sites with a known or potential PFAS release and prioritized investigating sites with drinking water supply within one mile downgradient from known release sites. A Preliminary Assessment (PA) for PFAS at NBK-Bangor was conducted in 2020 to identify potential PFAS sources at NBK-Bangor and identify areas requiring further investigation (CH2M, 2020). Twenty-three areas were recommended for further evaluation in a Site Inspection (SI) as potential or confirmed PFAS release areas in the PA. The SI report was finalized in December 2023 and recommended three sites to move forward to a Remedial Investigation (CH2M, 2023).

A desktop evaluation of off-base drinking water sources was conducted as part of the PA following the identification of confirmed PFAS release areas. The objective of this evaluation was to determine whether groundwater is used as drinking water within one mile downgradient of the confirmed PFAS release areas identified in the PA, consistent with the Navy's 2016 policy memo (Navy, 2016). The evaluation concluded that groundwater is used as drinking water near NBK-Bangor and that private drinking water wells are located within 1 mile downgradient of the confirmed PFAS release areas. Thus, in 2020, the Navy initiated drinking water sampling near NBK-Bangor to ensure the communities near the base were not exposed to drinking water with PFOA and/or PFOS above 70 ppt, the DoD's interim action level at the time. As part of the off-base investigation, two residences, hereby referred to as Resident 1 and Resident 2, were found to have wells with exceedances of 70 ppt. As a result, bottled water was provided to both private residences under an emergency removal action (Navy, 2020). After multiple rounds of sampling Resident 1's well, no further action was recommended due to no additional exceedances. Resident 2 continued to receive bottled water until they were connected to the Silverdale Water District (SWD) in 2024 (Navy, 2023). Following the initial voluntary drinking water sampling performed near NBK-Bangor in 2020, a periodic drinking water sampling program was implemented to monitor PFAS in the drinking water well where PFAS was detected above 70 ppt and adjacent residences with drinking water wells. The periodic drinking water sampling program includes biannual sampling to evaluate temporal and spatial variability of PFAS.

On April 26, 2024, the EPA issued a final National Primary Drinking Water Regulation (NPDWR) establishing nationwide drinking water standards for certain PFAS under the Safe Drinking Water Act. This regulation applies to public drinking water systems. Operators of public drinking water systems regulated by the NPDWR have five years to meet these standards. In September 2024, DoD published "Prioritization of Department of Defense Cleanup Actions to Implement the Federal Drinking Water Standards for Per- and Polyfluoroalkyl Substances under the Defense Environmental Restoration Program," which describes DoD's plans to incorporate the EPA's drinking water regulation into DoD's ongoing PFAS cleanups and prioritize actions to address private drinking water wells with the highest levels of PFAS from DoD activities. This policy authorizes the Navy to provide enduring solutions to address private drinking water wells where certain PFAS are at or above the levels established in the policy and shown in **Table 1**. Further, in accordance with the DoD policy, bottled water may only be provided to homes with wells above 70 ppt PFOS and/or PFOA.

Table 1 shows the DoD's Interim Action Levels for PFAS in Private Drinking Water Wells.

Table 1. DoD's Interim Action Levels for PFAS in Private Drinking Water Wells

PFAS	Level
perfluorooctanoic acid (PFOA)	12 parts per trillion (ppt)
perfluorooctane sulfonic acid (PFOS)	12 ppt
perfluorononanoic acid (PFNA)	30 ppt
perfluorohexane sulfonic acid (PFHxS)	30 ppt
hexafluoropropylene oxide dimer acid (HFPO-DA, or GenX)	30 ppt
hazard index for mixture of at least two of PFHxS, PFNA, HFPO-DA, and perfluorobutane sulfonic acid (PFBS)	3 (no units)

As of December 2024, 363 off-base drinking water wells have been sampled by the Navy near NBK-Bangor, and certain PFAS exceed one or more of the DoD's Interim Action Levels for PFAS in seven drinking water wells, including one well discussed above that does not require an enduring solution; one well that serves one home connected to the SWD by the Navy (Navy, 2023); one well serving multiple properties connected to the SWD on their own accord; and four wells serving four properties that are the subject of this AM. In accordance with the DoD policy, the Navy will conduct TCRAs when possible. The DoD policy also dictates that bottled water may only be provided to homes with wells above 70 ppt PFOS and/or PFOA. Therefore, the Navy is providing point of use (POU) filtration systems to these homes as a short-term solution prior to conducting the enduring/long-term solution (Navy, 2025).

3.0 Threats to Public Health or Welfare or the Environment, and Statutory and Regulatory Authorities/Endangerment Determination

Potential releases of pollutants and contaminants may present an imminent and substantial endangerment to public health, welfare, and the environment. Any historical release on Navy facilities has the potential to impact groundwater and drinking water adjacent to the Navy facilities. The Navy continues to investigate releases and migration of those releases through the RI at NBK-Bangor.

Following the September 2024 DoD policy memorandum, the Navy identified four private drinking water wells containing certain PFAS above the DOD's Levels, but less than 70 ppt PFOS and/or PFOA, and notified the residents.

4.0 Removal Action and Estimated Costs

The following are alternative actions considered and descriptions of their level of protectiveness and how the action is or is not an effective solution for the impacted residences:

- Connection to a public water supply and decommissioning of the existing drinking water well is considered the most protective and effective alternative for properties that have access to a public drinking water distribution system because this action eliminates access to the impacted private drinking water well and therefore cuts off receptor exposure. This alternative provides for unlimited use of drinking water at the off-base residences, with no post-removal site control or periodic operation and maintenance, which makes it a lower cost option to implement over time. In addition, PFAS would not be released back into the environment through disposal of wastewater (via the septic system) or through disposal of spent filtration material. System installation would be carried out in accordance with public water system requirements.
- Point-of-Entry (POE) water treatment alternatives are considered protective and effective solutions because PFAS compounds are removed from the groundwater supply from the private drinking water well through treatment. POEs have long-term ongoing associated maintenance, monitoring and disposal costs, and requirements that must be addressed in a timely manner to maintain protectiveness and effectiveness. This alternative is not considered the most efficient solution for properties near NBK-Bangor because they are near a public water supply and POEs have ongoing maintenance, disposal, and coordination requirements.
- Continuing to provide a POU filtration system for up to four off-Base residences for drinking and cooking will address PFAS impacts above the DoD's Levels for PFAS in private drinking water wells; however, it is considered comparatively minimally protective or effective because water may continue to be used for potable or non-potable purposes and therefore, receptors are still exposed, and the water impacted with specific PFAS may be rereleased to the environment in septic leach fields with no controls.
- Drilling a new private well is considered minimally effective because PFAS concentration and distribution within the aquifer is not yet fully defined. It is unknown whether an aquifer groundwater with concentrations below DoD Levels, suitable for drinking water, exists at depths where construction of a drinking water well is practical at the location of the affected residence. For this alternative, until the PFAS source, fate, and transport conceptual model are identified, there is a risk that groundwater used as the replacement water source could become impacted with PFAS under long-term pumping.

The Navy has identified the most protective and efficient long-term solution, construction details, estimated costs, and rationale for selection for each property below:

- **Residents 3-6: Connection to SWD.** Roughly 1,860 linear feet of distribution piping and associated water supply pumping improvements will be installed to support the connection. The baseline estimated project costs include the project work plan, safety plan, planning costs, management costs, and excavation and connection costs for an estimated total cost of $800,500. With variability and uncertainty, total project

costs could potentially be as high as $1,200,750, which is consistent with typical estimate variability noted for conceptual and feasibility study project predesign planning under AACE International (formerly the Association for the Advancement of Cost Engineering) Class 4 estimating guidelines. All work will be conducted in accordance with the public drinking water system regulations. The other alternatives were eliminated because Residences 3-6 are adjacent to a public drinking water distribution system and this is the most protective solution.

The Navy estimates the implementation of all removal action components (including the design and construction) may take up to 1 year after the AM is signed.

5.0 Expected Change in the Situation Should Action be Delayed or Not Taken

If recommended removal actions are delayed or not implemented, the Navy will continue to provide POU filtration systems (Navy, 2025). Failure to provide clean drinking water to residents with impacted water would result in continued exposure to PFAS above the DoD's Interim Action Levels for private drinking water wells.

6.0 Future Regulatory Standards for PFAS

This removal action is being performed for off-base drinking water based on the exceedance of DoD's Interim Levels for the PFAS in private drinking water wells. If additional regulations for PFAS are established, then the Navy will need direction from DoD and all drinking water data collected will be reevaluated to determine if additional removal actions by the Navy may be warranted.

7.0 Recommendations

This memorandum documents approval of the TCRA to address off-base drinking water exposure to PFAS compounds for the four identified well locations affecting multiple residences near NBK-Bangor. Conditions at the site meet the NCP Section 300.415(b) and (n)(2) criteria for removal and approval is recommended for the proposed removal action. NAVFAC Northwest is undertaking this TCRA.

Approval:

J.W. HALE
Captain, United States Navy
Commanding Officer

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Date

8.0 References

Department of the Navy (Navy). 2016. *Perfluorinated Compounds/Perfluoroalkyl Substances (PFC/PFAS) - Identification of Potential Areas of Concern (AOCs). June 20.*

Department of Defense (DoD). 2024. *Prioritization of Department of Defense Cleanup Action to Implement the Federal Drinking Water Standards for Per- and Polyfluoroalkyl Substances under the Defense Environmental Restoration Program.* September 3.

Navy. 2020. *Emergency Response Action Memorandum, Naval Base Kitsap Bangor, Silverdale Washington.* March 3.

CH2M HILL, Inc. (CH2M). 2020. *Preliminary Assessment for Per- and Polyfluoroalkyl Substances (PFAS).* Final. December.

CH2M. 2023. *Site Inspection Report for Per- and Polyfluoroalkyl Substances.* Final. December.

Navy. 2023. *Off-Base Private Drinking Water Removal Action Memorandum, near Naval Base Kitsap-Bangor, Silverdale, Washington.* November.

Navy. 2025. *Action Memorandum – Point of Use Drinking Water Treatment, near Naval Base Kitsap- Bangor, Silverdale, Washington.* January.