



Response to Comments

Interim Action Work Plan & SEPA Determination of Non-Significance

EFR HQ IVES Cleanup Site

Issaquah, WA

Toxics Cleanup Program

Washington State Department of Ecology
Northwest Region Office
Shoreline, Washington

May 2026

Publication Information

This document is available on the Department of Ecology's [EFR HQ IVES cleanup site webpage](#).¹

Cover photo credit

- Eastside Fire & Rescue Headquarters property, part of the EFR HQ IVES cleanup site, 2023, WA State Dept of Ecology

Related Information

- Cleanup Site ID: 16581
- Facility Site ID: 87761647

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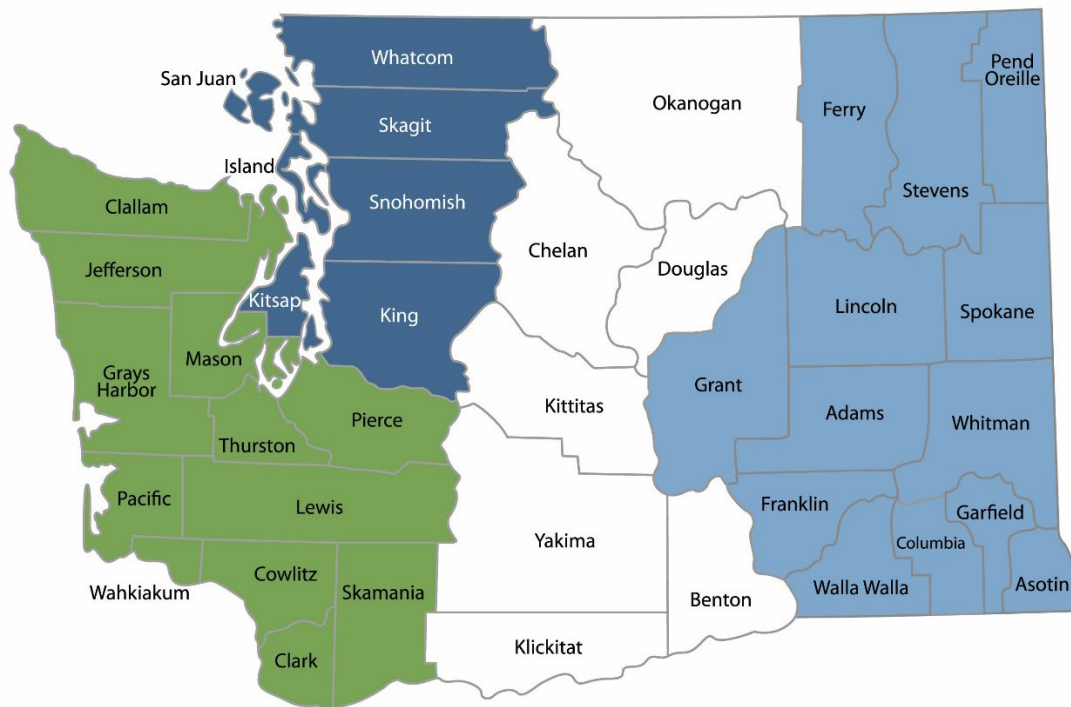
¹ <https://apps.ecology.wa.gov/cleanupsearch/site/16581>

² <https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup>

³ <https://ecology.wa.gov/about-us/accessibility-equity/accessibility>

Department of Ecology's Region Offices

Map of Counties Served



Southwest Region
360-407-6300

Northwest Region
206-594-0000

Central Region
509-575-2490

Eastern Region
509-329-3400

Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
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Washington State Department of Ecology
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Shoreline, WA

May 2026



DEPARTMENT OF
ECOLOGY
State of Washington

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Outreach Summary

The EFR HQ IVES (Eastside Fire & Rescue Headquarters and Issaquah Valley Elementary School) cleanup site, situated in the Lower Issaquah Valley located northwest of downtown Issaquah., is undergoing Washington State’s [formal cleanup process](#)⁴ as directed under the Model Toxics Control Act ([MTCA](#)⁵). The WA State Department of Ecology is addressing contamination at the site.

Ecology’s outreach activities related to this site’s 60-day comment period (October 20, 12:00 a.m. – December 22, 11:59 p.m., 2025) included:

- **Fact Sheet:**
 - US mail distribution of a postcard providing information about the cleanup site, the public comment period, and open house event to over 39,000 addresses, including all those in the impacted water service areas as well as other interested parties.
 - Email distribution of the fact sheet to over 250 people, including interested individuals, local/county/state/federal agencies, neighborhood associations, and interested community groups.
 - The postcard and fact sheet were available digitally through Ecology’s [cleanup site webpage](#)⁶ in English. The fact sheet was also available online in Spanish and Chinese.
- **Legal Notices:**
 - Publication of one print display ad in [The Seattle Times](#),⁷ dated Saturday, October 18, 2025.
 - Publication of digital ads with the online [Issaquah Reporter](#)⁸ from Monday, October 20 to Monday, December 22, 2025.
- **Contaminated Site Register newsletter:**
 - Publication of six notices in Ecology’s [Contaminated Site Register](#):⁹
 - Comment Period Notice:
 - October 16, 2025
 - October 30, 2025
 - November 13, 2025
 - November 27, 2025
 - December 11, 2025
 - Visit [Ecology’s Contaminated Site Register website](#)¹⁰ to download PDFs.

⁴ <https://ecology.wa.gov/MTCA-process>

⁵ <https://ecology.wa.gov/mtca>

⁶ <https://apps.ecology.wa.gov/cleanupsearch/site/16581>

⁷ <https://www.seattletimes.com/>

⁸ <https://www.issaquahreporter.com/>

⁹ <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Site-Register-lists-and-data>

¹⁰ <https://apps.ecology.wa.gov/publications/UIPages/PublicationList.aspx?IndexTypeName=Program&NameValue=Toxics+Cleanup&DocumentTypeName=Newsletter>

- **Media Notification:**
 - Ecology sent a media notice on Thursday, October 16, 2025, to *The Seattle Times* newspaper, the online *Issaquah Reporter*, the online *Sammamish Independent*, and the online *Issaquah Daily*.
- **Media Coverage:**
 - None
- **Blog and Social Media:**
 - Ecology posted a [blog](#)¹¹ on October 20, 2025.
 - Facebook event postings:
 - [Open House \(in-person\)](#)¹²
 - [Open house \(online\)](#)¹³
- **Open House Event**
 - Ecology hosted an in-person and online Open House event from 5:00 pm to 7:00 pm on Wednesday, November 5, 2024, at the Eastside Fire & Rescue, 175 Newport Way NW, Issaquah. During the Open House event, staff from Ecology, City of Issaquah, Eastside Fire & Rescue, Sammamish Plateau Water, WA Dept of Health, and King County Health were available to talk with community members and answer questions. During the event, staff engaged with the public to discuss the cleanup site and answer questions.
- **Websites:**
 - Ecology announced the comment period, posted the fact sheet and postcard, and made the review documents available on the following webpages:
 - Ecology's [cleanup site webpage](#)¹⁴
 - Ecology's [Rainier Trail & Memorial Field cleanup site webpage](#)¹⁵
 - [Ecology's Public Inputs & Events webpage](#)¹⁶
- **Document Repositories:**
 - Copies of the review documents and fact sheets (including translations) were available for review at the Issaquah Public Library.
 - Outreach materials also directed the public to contact Kristen Forkeutis, Outreach Specialist, for document review assistance.

¹¹ <https://ecology.wa.gov/blog/october-2025/cleaning-up-planning-early-actions-to-manage-pfas-at-eastside-fire-rescue-headquarters>

¹² <https://www.facebook.com/share/1BQKpc1RLQ/>

¹³ <https://www.facebook.com/share/17hp8CmmEn/>

¹⁴ <https://apps.ecology.wa.gov/cleanupsearch/site/16581>

¹⁵ <https://apps.ecology.wa.gov/cleanupsearch/site/16582>

¹⁶ <https://ecology.wa.gov/Events/Search/Listing>

Comment Summary

From October 20, 12:00 a.m. to December 22, 11:59 p.m., 2025, Ecology solicited comments on an Interim Action Work Plan and State Environmental Policy Act (SEPA) Determination of Non-Significance. The Interim Action Work Plan describes the planned cleanup work of contaminated soil and groundwater associated with the EF&R Headquarters property. The SEPA Determination of Non-Significance is Ecology's determination that the cleanup work is not likely to harm the environment.

Ecology received five formal comments during the 60-day comment period.

Table 1: List of Commenters

	Date	First Name	Last Name	Agency, Organization, or Business	Submitted By
1	10/22/25	Jesse	LeGault		Individual
2	10/24/25	Dean	Kerekes		Individual
3	10/27/25	Peter	Hansen		Individual
4	11/30/25	Emily	Jones		Individual
5	12/18/25	John	Krauss	Sammamish Plateau Water	Organization

Next Steps

Ecology has reviewed and considered the comments received on the Interim Action Work Plan and SEPA Determination of Non-Significance. Based on Ecology's evaluation of the comments, some updates will be made to the Interim Action Work Plan. However, these updates are not significant enough to warrant a second comment period.

Ecology will finalize the documents and proceed with the cleanup for this site. See the graphic below and visit Ecology's [cleanup process webpage](https://ecology.wa.gov/MTCA-process)¹⁷ to learn more about Washington's cleanup process.

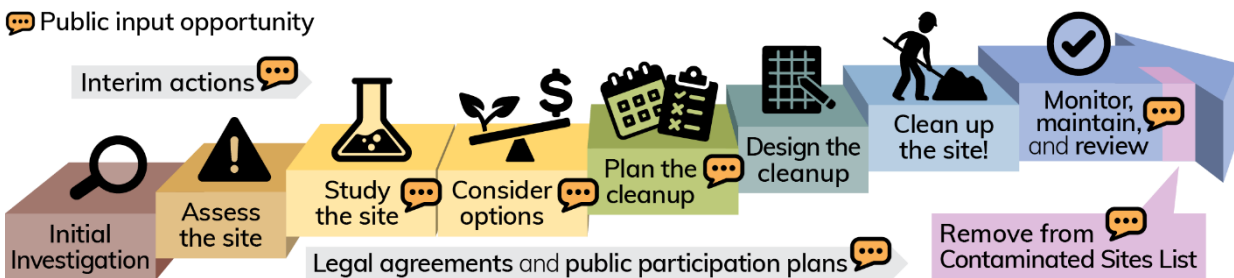


Figure 1: Washington's cleanup process

Public Comments and Responses

The public comments are presented below, along with Ecology's responses. The Appendix contains the comments in their original format.

Comment from: Jesse LeGault, 10/22/25

I think this project is a great idea and I support proactively removing the pollutants in the water supply.

Response:

Thank you for your comment. We appreciate hearing your feedback and receiving your support for this planned work.

¹⁷ <https://ecology.wa.gov/MTCA-process>

Comment from: Dean Kerekes, 10/24/25

I have no knowledge of existing cleanup practice but why would we continue to allow fire emergency agencies to continue to store and utilize PFAS containing foam. There are very good alternative available...I recommend and replaced these in 2018 in all the automated fire suppression systems at a major household manufacturing company

Response:

Thank you for your comment and recommendation.

Eastside Fire & Rescue (EF&R) and other fire departments have been restricted from using Aqueous Film Forming Foam (AFFF) in training scenarios since the [Toxics in Firefighting Law](#).¹⁸ was passed in Washington in 2018. The sale of AFFF-containing firefighting foam to municipal fire departments has also been banned since January 1, 2020.

While AFFF-containing foams may still be used in fire responses, fire departments are in the process of disposing of these agents under Washington's Hazardous Waste Regulations. There are exemptions to these regulations for military, airport, and refinery use. More information about Washington's AFFF collection and disposal program may be found here:

<https://ecology.wa.gov/waste-toxics/reducing-toxic-chemicals/product-replacement-program/afff-disposal>

Comment from: Peter Hansen, 10/27/25

My child attends Issaquah Valley Elementary, one of the cleanup sites. I am uncomfortable regarding his possible exposure to PFAS chemicals when he plays at recess. He has told me how kids will sometimes dig in the dirt.

Response:

Thank you for sharing your concern and feedback. While not part of this interim action, the Issaquah Valley Elementary School is part of the EFR HQ IVES cleanup site, because firefighting training was conducted there. The Remedial Investigation for the EFR HQ IVES cleanup site includes sampling and evaluating soils at Issaquah Valley Elementary School. Soil sampling results are being reviewed by Ecology and the Department of Health for recommendations regarding field use and other guidance, which will be shared with the school to communicate with all parents/guardians. Ecology always recommends taking simple steps to reduce exposure to contaminated soil and limit its spread—See [Healthy actions - Washington State Department of Ecology](#).¹⁹ for more information.

¹⁸ <https://ecology.wa.gov/waste-toxics/reducing-toxic-chemicals/washingtons-toxics-in-products-laws/toxics-in-firefighting>

¹⁹ <https://ecology.wa.gov/spills-cleanup/contamination-cleanup/dirt-alert-program/healthy-actions>

Comment from: Emily Jones, 11/30/25

I am submitting a comment regarding the EFR HQ IVES Cleanup site.

After reviewing SEPA 202504352, I appreciate the implementation of protective measures, such as the expansion and soil stabilization of the permeable reactive barrier (PRB). To promote transparency among all stakeholders, I recommend that monitoring results be made publicly available.

According to Lyu et al. (2022), there is an emphasis on the necessity of long-term monitoring due to the persistence of PFAS and the risk of plume rebound. I suggest that SEPA 202504352 incorporate a clearly defined groundwater monitoring schedule.

"Given PFAS persistence and mobility in subsurface environments, long-term groundwater monitoring is critical. I recommend at least a 10-year post-installation monitoring plan, with annual public reporting, to ensure the PRB continues to meet remediation goals." (Lyu et al. 2022)

Response:

Thank you for your comment.

As part of the Model Toxics Control Act (MTCA) [cleanup process](#),²⁰ a Cleanup Action Plan (CAP) will be developed to describe the selected cleanup action, set cleanup standards, schedule next steps, and set requirements for monitoring and maintenance. The CAP requires compliance monitoring to evaluate the effectiveness and ongoing operation of the permeable reactive barrier. The Compliance Monitoring Plan is incorporated into the CAP as Appendix H and includes descriptions of monitoring and reporting requirements. The compliance monitoring results will be reported on a semi-annual basis once the interim action is complete. Ecology will upload the reports to the [Site database](#)²¹ for public access and review upon receipt. The CAP will be shared with the public for review and comment during a future comment period.

Regarding long-term monitoring, this interim action will be incorporated into any permanent Cleanup Action Plan developed for the Site. Due to the size and complexity of the Site, it is expected that any permanent solution and required monitoring programs will be multi-year commitments.

If you are interested in receiving notifications about the EFR HQ IVES cleanup site, please subscribe to the [site webpage](#)²² and click the "Subscribe to this site" button in the upper right corner. You can unsubscribe at any time. You may also request to be added to the site mailing list by emailing Kristen.Forkeutis@ecy.wa.gov.

²⁰ <https://ecology.wa.gov/MTCA-process>

²¹ <https://apps.ecology.wa.gov/cleanupsearch/site/16581#site-documents>

²² <https://apps.ecology.wa.gov/cleanupsearch/site/16581>

Comment from: Jay Krauss, Sammamish Plateau Water, 12/18/25

Note – See the appendix to view this comment in its original format, which includes footnotes and attachments.

December 18, 2025

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Re: Comments on EFR/IVES PFAS Site Draft Interim Action Work Plan and SEPA
DNS/Checklist
Ecology Cleanup Site ID: 16581

Dear Ms. Wooten and Mr. Atkins:

Introduction

Sammamish Plateau Water and Sewer District (the District or Sammamish Plateau Water) is commenting on two related documents from the Department of Ecology (Ecology) related to the Eastside Fire and Rescue Headquarters and Issaquah Valley Elementary School cleanup site (EFR/IVES, Site ID: 16581). The first is the draft Interim Action (IA) work plan, and the second is the checklist and Determination of Nonsignificance (DNS) under the State Environmental Policy Act (SEPA).

Consistent with its previous comments on interim actions proposed for this Site, the District believes that the draft IA work plan and associated SEPA review documents lack sufficient information and evaluation on what appears intended to be part of the permanent remedial action for the Site. Specifically:

- They lack adequate information on the mass of PFAS present at the EFR headquarters site that is to be addressed by the interim action, and related evaluation of the

effectiveness of the proposed sequestration treatments including effectiveness over time;

- They lack consideration and evaluation of alternatives to the proprietary treatments being proposed;
- They lack evaluation of the proposed treatment of vadose zone soils, which was not included in the pilot test;
- They lack evaluation of impact on remedial options in the event that the Interim Action fails, including through breakthrough or contaminant “roll over;” and
- They lack identification of or planning for potential contingencies in the event of remedy failure.

As a result, the draft IA work plan does not satisfy requirements of the Model Toxics Control Act (MTCA), and the SEPA review fails to provide information and evaluation required to support issuance of a DNS.

Accordingly, Ecology should not approve the draft IA work plan. Instead, Ecology should require revisions to address the comments and concerns raised in this letter and attachments. It should also withdraw the SEPA DNS and not revisit SEPA review until concerns raised here are addressed in a revised IA work plan. Given the significance of this proposed action for the Lower Issaquah Valley Aquifer (LIVA) and the many thousands of people who rely upon it for potable water supply, early scoping for SEPA review would be appropriate.

As always, the District remains available to collaborate with Ecology to ensure that any IA will in fact improve conditions at the Site without creating unintended risks that could adversely impact the LIVA or jeopardize later efforts to cleanup of the Site.

District’s June 2024 comments on LIVA PFAS Agreed Orders

As part of its ongoing engagement with Ecology, Eastside Fire and Rescue, and the City of Issaquah, the District submitted detailed comments in June 2024 on the Agreed Order for the EFR/IVES Site.

The letter explains the District’s interests as a major public water purveyor that relies on the LIVA as its primary source of supply. As a result of PFAS contamination at two of the District’s production wells (wells 7 and 8), the District stopped production from the wells in 2017, and in 2021 obtained authorization from Ecology to pump the authorized quantities for those wells from its well 9. Wells 7 and 8 continue to exhibit PFAS contamination well above applicable screening levels. Ecology has recognized the District’s interests in the LIVA PFAS sites through its fact sheets and mailers, and through its water rights permitting process, all of which identify the District’s south zone, and specifically, wells 7 and 8, as impacted by PFAS contamination associated with the EFR/IVES Site.³

Ecology is also working with the District to install a treatment system to address PFAS contamination in wells 7 and 8. Ecology is providing partial funding for the capital costs of

installing treatment. However, the District and its customers are providing the majority of the funding for capital costs, and will be responsible for all ongoing O&M costs, which will be substantial.

Given these critical interests, the District supports timely and efficient investigation and cleanup of the LIVA PFAS sites consistent with MTCA. Accordingly, the District's June 2024 comments expressed a number of concerns with the interim action proposed in the EFR/IVES Agreed Order, including that:

- Any proposal for a permeable reactive barrier (PRB) needs to demonstrate that it will not foreclose reasonable alternatives for permanent cleanup at the Site;
- The IA work plan should describe alternative interim actions considered and explain why they were not selected;
- The IA work plan should evaluate the impacts of injecting PFAS sequestration compounds deep into the aquifer, including performance effectiveness after the sequestration media in the PRB becomes saturated with PFAS;
- The IA work plan should evaluate the long-term effects of saturated media on the aquifer and groundwater quality; and
- The IA work plan should include appropriate contingency plans for responding to remedy failure, such as saturated media becoming a source of future groundwater contamination.

Ecology's August 2024 response to District's Agreed Order comments

Ecology responded to the District's comments in August 2024. Ecology acknowledged the District's engagement on the sites over time, including its submission of data on the District's wells to help with the overall understanding of the sites, and expressed Ecology's interest in continuing to work with the District "as the project progresses." With regard to the Interim Action, Ecology stated as follows:

We acknowledge that the language in Appendix C related to the permeable reactive barrier implied an Interim Action had already been selected, when it has not. We have updated the language accordingly. An Interim Action work plan will go out for public comment prior to the implementation of the Interim Action. We hope that document will answer many of the questions you raise in these comments, and we appreciate any additional comments you may have on the document at that time.

September 2025 EFR/IVES Site Interim Action Work Plan and SEPA DNS/Checklist

Based on Ecology's response to the District's comments on the Agreed Order discussed above, the District expected the draft Interim Action work plan would address the concerns the District has repeatedly raised about the reactive barrier employed in the pilot test and proposed for significant expansion in the Interim Action. Unfortunately, the draft IA work plan does not satisfy these expectations.

The District's consultants, CDM Smith, developed the attached detailed comments on the draft Interim Action work plan and the SEPA DNS/checklist. In sum, the District is concerned that the draft work plan and current SEPA checklist/DNS do not provide adequate information or evaluation of the many uncertainties associated with this significant project affecting the aquifer that tens of thousands of residents of the Issaquah Valley and Sammamish Plateau rely upon for their drinking water.

Before proceeding with this proposed interim action Ecology should pause, evaluate alternatives, and fully evaluate the effects of any action on the aquifer, the communities that rely upon it, and on future cleanup options. Ecology should also identify contingencies in the event that this relatively new proprietary treatment – the purpose of which is to indefinitely or permanently sequester PFAS in the aquifer – fails. The IA work plan should include contingency plans. Until these steps are taken, the Interim Action work plan and SEPA review are incomplete and inconsistent with MTCA and SEPA.

Sammamish Plateau Water's Continuing Concerns with Draft Interim Action Work Plan and SEPA DNS/Checklist

There are significant uncertainties and unknowns with the current site characterization and with the proposed permanent application of proprietary remedial action products as an “interim” action. The IA work plan and SEPA review needs to be supported with factual evidence (information/data) and include objective statements recognizing the large number of unknowns related to this interim action, some of which should be addressed with more preliminary design investigations, additional pilot and bench-scale testing, and ongoing monitoring evaluation of the previously implemented pilot test to improve the design before rushing into this action of such scale and permanency. These steps are fundamental to standard remedial design practices that are being overlooked for an action characterized by the qualified term “Interim,” but which is effectively permanent: it would be difficult if not impossible to reverse the injections into the aquifer in the event of remedy failure.

Uncertainties and unknowns that should be investigated, evaluated and presented before implementing this very large and permanent “interim” action include:

- **The presence (in terms of mass) of PFAS precursor chemicals.** PFAS precursor constituents likely exist in soils at the Site that are planned to be left in place post interim action. These precursors can, over time, transform into PFAS constituents at concentrations of regulatory concern. Further sampling and characterization should be conducted to estimate the mass of PFAS at the Site, including precursor chemicals.
- **The effectiveness of the current pilot tested barrier wall.** A critical and objective review on the performance of the EFR/IVES pilot test and any effectiveness issues and lessons learned from this smaller scale pilot test is crucial to informing the design of this Interim Action, which proposes using the same construction methods and coagulated activated carbon (CAC)-based proprietary product on a more

expansive scale. For example, the draft Interim Action work plan proposes a line of injection locations to increase the thickness of the pilot test barrier wall. This suggests that predesign calculations, models, and/or estimates were lacking, or that observations from the pilot have not been effectively communicated. The District has previously raised concerns about contaminant breakthrough and believes the IA work plan requires a much more detailed analysis before proceeding.

- **The constructability, necessity and impacts (good/bad) of injecting the CAC into the vadose zone.** As pointed out in the attached detailed comments on the Interim Action work plan, injection of CAC into the vadose zone was not performed in the pilot test and is a significant unknown. A separate small-scale pilot test should be performed to evaluate and inform the design before performing this at the scale proposed in the Interim Action. Relevant and tangible performance metrics need to be assigned to the vadose zone injection to confirm delivery of CAC and reductions in vadose zone to groundwater leaching. Currently, no performance metrics are presented or considered to evaluate this significant unknown and the necessity of this injection to the vadose has not been demonstrated, which is a requirement for Interim Actions under MTCA.
- **Bench Testing of other media types.** The current plan and design for soil stabilization and expanded aquifer injections is proposing to use CAC. There are several other media that may be more economical and effective. These should be considered through bench testing before moving forward with the CAC-based product sold by the same vendor (Regenesis) that is playing a significant role in the design.
- **A contingency plan to address any issues or failure of the interim action.** The current IAWP is void of any descriptions of logical contingency plans in the event the interim action is found (through performance monitoring) to be failing or underperforming relative to design objectives. This should be developed with iterative logic that addresses any failures of the design components critical for meeting interim action objectives over the period of the time the remedy components are intended to be performing, which for the permeable reactive barrier wall (PBR) is indefinite. This contingency planning is critical for the proposed PBR due to the potential that, at some point in time, the concentrating PFAS within the barrier wall could lead to higher concentrations in groundwater downgradient of the barrier wall due to competitive desorption by other constituents in groundwater (something colloquially referred to as “roll over”).

Conclusion

As Ecology is aware, the District supports timely and efficient investigation and cleanup of the LIVA PFAS sites consistent with MTCA.⁸ We know Ecology shares these goals, as expressed in part through Ecology’s funding for much of the work being performed at the EFR/IVES Site. We therefore look forward to Ecology working to revise the Interim Action work plan and associated SEPA review to address the District’s significant comments and concerns.

We also look forward to continuing to collaborate with Ecology on these important efforts. As has always been the case, the District would be happy to make its consultants available to Ecology to discuss the proposed Interim Action, our comments, and any other technical concerns related to the LIVA PFAS sites.

Sincerely,

John C. Krauss
General Manager

Cc:

Kristen Forkeutis, Ecology
Scott Coffey, CDM Smith
Matt Wells, Foster Garvey

Attachment: CDM Smith December 18, 2025 Review and Comments on Draft Interim Action Work Plan for EFR/IVES Site and Associated SEPA DNS/Checklist, Ecology Cleanup Site ID: 16581

25-12-37

Response:

Thank you for your comments. We recognize your concerns about impacts on the Lower Issaquah Valley Aquifer and the communities that rely upon it. We are committed to protecting this resource and have considered your feedback about the Interim Action Work Plan (IAWP) and State Environmental Policy Action Determination of Non-Significance (SEPA DNS) and Checklist. Nonetheless, the Model Toxics Control Act will dictate the course of action we take as does the financial burden the state is facing to address PFAS contamination. Therefore, we will work to answer your questions and potentially find reasonable solutions that may require compromise.

Our response to your comments will be separated into the following sections:

- Primary Concerns and Summarized Responses
- Direct responses to Sammamish Plateau Water's main points of concern
- Direct responses to CDM's main points of concern
- Next steps

Primary Concerns and Summarized Responses

Upon review of your comments about both the draft IAWP and SEPA DNS and Checklist, we understand them to focus on the following three primary concerns, which are broadly addressed below.

1. The Site, or select aspects of the Site, have been insufficiently characterized to support identification of interim actions.

While we appreciate SPWSD's interest in additional characterization of the Site, completion of the Remedial Investigation for the Site is not a requirement for an interim action. Per Washington Administrative Code (WAC) 173-340-430(1), an interim action may be performed at any point in the cleanup process where it is deemed necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance; corrects a problem that may become substantially worse or cost more to address over time; or is necessary to provide for completion of other cleanup work. As previously discussed, the releases to groundwater and completed exposure pathway through the City of Issaquah's production well COI-PW04 and the ongoing releases identified at the EFR HQ Source Area meet these criteria.

The EFR HQ Source Area is spatially limited and characterized sufficiently to evaluate and design an interim action. The nature and extent of contamination at this location is well understood based on an extensive program of soil and groundwater sampling. Additional data collection is already underway as part of the Remedial Investigation that will further refine the conceptual site model but is not expected to substantively change the reported nature and extent of contamination at the EFR HQ Source Area that will be used to prepare the Feasibility Study.

Additionally, the Remedial Investigation and subsequent Feasibility Study for the EFR Site is ongoing, with the goal of further characterizing the Site, potential contaminant and exposure pathways, and potential affected parties and ecological receptors.

2. Further evaluation of other alternatives should be conducted prior to proceeding with selection of an interim action.

Pilot testing performed in 2021 collected additional specific design information including flux of per- and polyfluoroalkyl substances (PFAS) in groundwater at selected wells, groundwater flow velocities, placement of colloidal activated carbon (CAC) in the subsurface, and evaluation of CAC efficacy in treating PFAS in groundwater. A technology evaluation was performed and reported as part of the Pilot Test (Farallon 2023). The combined investigation and pilot test data provides a comprehensive and thorough evaluation of the EFR HQ Source Area sufficient to identify and design an interim action

that will substantially reduce a pathway and address imminent threats to human health and the environment.

While further evaluation of other alternatives is possible, the pilot test has already demonstrated that the proposed construction methods are feasible at the EFR HQ Source Area, CAC placement was consistent throughout the treatment interval, and CAC treatment of groundwater resulted in removal of 99-percent or more of target PFAS from groundwater. These results would appear to directly satisfy SPWSD's concerns regarding the constructability and impacts associated with injecting CAC into the saturated soil column and vadose zone. Placement was previously confirmed visually through coring within the barrier and performance groundwater monitoring following construction of the Pilot Test permeable reactive barrier.

Additional bench testing, as requested by SPWSD, would be in addition to the bench testing already specified as part of the Interim Action Work Plan and would delay implementation of the interim action. Section 5.2.4, Bench Testing indicates the final bench testing will be performed to identify the appropriate product dosing rate and efficacy of the treatment approach. Unless bench testing indicates the proposed approach would not be effective, and further evaluation is required, replication of the same test across multiple treatment products is beyond the scope of the interim action. The Interim Action Work Plan includes provisions for performance monitoring to ensure soil remediation levels are achieved as part of the interim action. As part of the final remediation, groundwater monitoring will evaluate both treatment removal efficacy and impacts to groundwater following construction.

3. The interim action may not perform as anticipated or could potentially foreclose future cleanup actions.

Completion of the interim action does not reduce or otherwise negate the requirement of the final cleanup action, selected by Ecology after the Feasibility Study process as specified in the Agreed Order, to be protective of human health and the environment and address all potential exposure pathways. Performance of the interim action, identified through the planned performance monitoring program, would be considered as part of identifying and developing the alternatives for Ecology's final cleanup action for the Site. Following the interim action, the results of the Remedial Investigation and Feasibility Study process will be reported to Ecology for its Cleanup Action Plan.

Direct response to Sammamish Plateau Water's main points of concern

Please see our direct responses to your recommendations about further investigating, evaluating and presenting additional information before implementing this interim action.

- **The presence (in terms of mass) of PFAS precursor chemicals.** PFAS precursor constituents likely exist in soils at the Site that are planned to be left in place post interim action. These precursors can, over time, transform into PFAS constituents at concentrations of regulatory concern. Further sampling and characterization should be conducted to estimate the mass of PFAS at the Site, including precursor chemicals.

Response: While further testing for total oxidizable precursors or other non-regulated constituents may add some new information, the resulting changes to the conceptual site model are expected to be minimal and are unlikely to significantly affect design criteria for the interim action, which will incorporate a margin of safety when considering total mass loading and estimated barrier life.

We acknowledge that EPA Method 1633A does not quantify all precursors. The uncertainty surrounding precursors will be addressed through periodic monitoring of groundwater. If break-through is observed, a contingency plan will be triggered. The contingency plan will be part of the Cleanup Action Plan developed after the interim action. Potential contingencies include excavating and disposing of source material and/or spent CAC and expanding the width of the PRB with fresh CAC downgradient of the existing CAC. The contingency plan is a form of adaptive management that allows us to make progress toward cleaning up the site in the face of uncertainty.

- **The effectiveness of the current pilot tested barrier wall.** A critical and objective review on the performance of the EFR/IVES pilot test and any effectiveness issues and lessons learned from this smaller scale pilot test is crucial to informing the design of this Interim Action, which proposes using the same construction methods and coagulated activated carbon (CAC)-based proprietary product on a more expansive scale. For example, the draft Interim Action work plan proposes a line of injection locations to increase the thickness of the pilot test barrier wall. This suggests that predesign calculations, models, and/or estimates were lacking, or that observations from the pilot have not been effectively communicated. The District has previously raised concerns about contaminant breakthrough and believes the IA work plan requires a much more detailed analysis before proceeding.

Response: Pilot testing performed in 2021 collected additional specific design information including flux of per- and polyfluoroalkyl substances (PFAS) in groundwater at selected wells, groundwater flow velocities, placement efficacy of colloidal activated carbon (CAC) in the subsurface, and evaluation of CAC efficacy in treating PFAS in groundwater. These results were presented in the PFAS Pilot Test Summary Report dated July 29, 2022.

Pursuant to the requirements of MTCA, the pilot testing was performed to evaluate the feasibility of constructing a CAC permeable reactive barrier (PRB) at the EFR Source Area and whether doing so would be effective reducing concentrations of PFAS in groundwater. To answer both questions a 55-foot long PRB was constructed across portion of the

EFR Source Area with the highest reported concentrations of PFAS in groundwater (NWN-MW10).

The barrier length was deemed sufficient for a pilot test to provide adequate monitoring data at the test well, understanding that some shadowing effects and fluctuations in groundwater flow may slightly impact the monitoring results. The pilot testing successfully confirmed a working radius of influence of 3.3 feet for each injection point and consistent placement of CAC in the subsurface. Groundwater monitoring data reported reductions in PFAS concentrations of up to orders of magnitude, corresponding to removal rates of 99-percent of quantitated PFAS mass from groundwater.

A technology evaluation was performed and reported as part of the Pilot Test (Farallon 2021). The combined investigation and pilot test data provides a comprehensive and thorough evaluation of the EFR HQ Source Area sufficient to identify and design an interim action that will substantially reduce a pathway and address imminent threats to human health and the environment. Based on the data collected and analysis submitted to date Ecology believes we have characterized the site sufficiently to proceed with the interim action instead of spending more time studying the site.

The Remedial Investigation is on schedule and still in progress, and the Feasibility Study has not been completed. Therefore, the interim action has been prepared consistent with the requirements of MTCA and does not foreclose any reasonable cleanup action alternatives in the future (WAC 1738340-430(3)(b)). These may include, but are not limited to, mass excavation, additional soil amendment, in-situ stabilization, encapsulation, and/or capping and monitored natural attenuation.

Completion of the interim action does not reduce or otherwise negate the requirement of the final cleanup action, selected by Ecology after the Feasibility Study process as specified in the Agreed Order, to be protective of human health and the environment and address all potential transport and exposure pathways. Performance of the interim action, identified through the planned performance monitoring program, would be considered as part of identifying and developing the alternatives for Ecology's final cleanup action for the Site. Following the interim action, the results of the Remedial Investigation and Feasibility Study process will be reported to Ecology for its Cleanup Action Plan. Pursuant to MTCA, contingency plans are not required for interim actions and would ultimately fall under Ecology's Cleanup Action Plan and review process for final cleanups.

- **The constructability, necessity and impacts (good/bad) of injecting the CAC into the vadose zone.** As pointed out in the attached detailed comments on the Interim Action work plan, injection of CAC into the vadose zone was not performed in the pilot test and is a significant unknown. A separate small-scale pilot test should be performed to evaluate and inform the design before performing this at the scale proposed in the Interim Action. Relevant and tangible performance metrics need to be assigned to the vadose

zone injection to confirm delivery of CAC and reductions in vadose zone to groundwater leaching. Currently, no performance metrics are presented or considered to evaluate this significant unknown and the necessity of this injection to the vadose has not been demonstrated, which is a requirement for Interim Actions under MTCA.

Response: While further evaluation of other alternatives is possible, the pilot test has already demonstrated that the proposed construction methods are feasible at the EFR HQ Source Area, CAC placement was consistent throughout the treatment interval, and CAC treatment of groundwater resulted in removal of 99-percent or more of target PFAS from groundwater.

These results would appear to directly satisfy SPWSD's concerns regarding the constructability and impacts associated with injecting CAC into the saturated soil column and vadose zone. CAC placement will be verified through confirmation coring and monitoring temporary piezometers at 3 locations each followed by performance groundwater monitoring (EDR S.5.5.2).

- **Bench Testing of other media types.** The current plan and design for soil stabilization and expanded aquifer injections is proposing to use CAC. There are several other media that may be more economical and effective. These should be considered through bench testing before moving forward with the CAC-based product sold by the same vendor (Regenesys) that is playing a significant role in the design.

Response: Additional bench testing, as requested by SPWSD, would be in addition to the bench testing already specified as part of the Interim Action Work Plan and would delay implementation of the interim action. Section 5.2.4, Bench Testing indicates the final bench testing will be performed to identify the appropriate product dosing rate and efficacy of the treatment approach. Unless bench testing indicates the proposed approach would not be effective, and further evaluation is required, replication of the same test across multiple treatment products is beyond the scope of the interim action.

The Interim Action Work Plan includes provisions for performance monitoring to ensure soil remediation levels are achieved as part of the interim action. As part of the final remediation, groundwater monitoring will evaluate both treatment removal efficacy and impacts to groundwater following construction.

- **A contingency plan to address any issues or failure of the interim action.** The current IAWP is void of any descriptions of logical contingency plans in the event the interim action is found (through performance monitoring) to be failing or underperforming relative to design objectives. This should be developed with iterative logic that addresses any failures of the design components critical for meeting interim action objectives over the period of the time the remedy components are intended to be performing, which for the permeable reactive barrier wall (PBR) is indefinite. This contingency planning is critical for the proposed PBR due to the potential that, at some point in time, the

concentrating PFAS within the barrier wall could lead to higher concentrations in groundwater downgradient of the barrier wall due to competitive desorption by other constituents in groundwater (something colloquially referred to as “roll over”).

Response: It is unlikely that the interim action will perform significantly differently than anticipated because the technologies to be employed have been tested on the Site. Additionally, Site soils will be subjected to additional bench testing during the interim action final design, and/or methods to be employed at the Site are commercially mature (i.e. excavation, capping). Finally, the performance monitoring provisions are designed to identify such an outcome.

Pursuant to MTCA, contingency plans are not required for interim actions and would ultimately fall under Ecology’s Cleanup Action Plan and review process for final cleanups. Completion of the interim action does not reduce or otherwise negate the requirement of the final cleanup action, selected by Ecology after the Feasibility Study process as specified in the Agreed Order, to be protective of human health and the environment and address all potential transport and exposure pathways. Performance of the interim action, identified through the planned performance monitoring program, would be considered as part of identifying and developing the alternatives for Ecology’s final cleanup action for the Site. Following the interim action, the results of the Remedial Investigation and Feasibility Study process will be reported to Ecology for its Cleanup Action Plan.

Direct response to CDM’s main points of concern

Please see our direct responses to the detailed recommendations for revising the IAWP and SEPA DNS/Checklist from CDM Smith.

1.0 Introduction, Page 1-1, 1st sentence, 1st paragraph: The text states that Farallon Consulting prepared this IAWP; however, it appears that Regensis performed significant portions of the design as evidenced by their branding on several of the appendices. It should be clearly stated that Regensis performed portions of the design (e.g., ISS and PRB), and that no other comparable remedial products were evaluated or considered.

Response: The section will be clarified to note that design was performed in coordination with Regensis (‘Contractor’).

1.0 Introduction, Page 1-1, 3rd & 4th paragraphs: Historical releases of AFFF have impacted source area soil, source area groundwater, and downgradient groundwater - The City withdraws groundwater as mentioned, but so does the District and this should be acknowledged.

Response: Will add text to note that SPWD also withdraws groundwater from the same aquifer.

1.3 Regulatory Interactions, Page 1-3, 2nd sentence, 1st paragraph: The text should be revised to specify that MTCA classifies 6 specific PFAS compounds (PFOA, PFOS, PFNA, PFHxS, PFBS, and HFPO-DA), not the entire class of PFAS. Note: It is confusing and imprecise to use the word "list"

in reference to hazardous substances as it implies RCRA.

Response: The text will be revised to reference the 6-PFAS list as the regulated hazardous substances of concern.

1.4 Abbreviated Class B AFFF Background, Page 1-5, 3rd sentence, 1st paragraph: Note: “PFAS-free AFFF” is a misnomer. For term consistency, the author should refer to the ITRC fact sheet on AFFF (ITRC, September 2023, link: https://pfas-1.itrcweb.org/wp-content/uploads/2023/10/AFFF_PFAS_FactSheet_Sept2023_final.pdf); all AFFF contain PFAS. This is important as the text suggests EFR transitioned to a PFAS-free AFFF, and there may be confusion if training continues to use “PFAS free-AFFF” (which still contains PFAS) and in doing so could compromise the effectiveness of the interim action.

Response: The text will be revised to reduce the chance for misinterpretation of the PFAS-Free AFFF nomenclature.

1.4 Abbreviated Class B AFFF Background, Page 1-5, 2nd paragraph: An estimate of historical AFFF discharged onto the EFR site soils should be determined as it is an important factor in understanding the residual PFAS precursors not targeted by current analytical method 1633A that will transform, over time, into PFAS of regulatory concern.

Response: Training frequency and estimated volumes of concentrated product used per training event were reported in the PFAS Characterization Study Summary Report (Farallon, 2019). Individual product records for each training event were not available.

2.1 Lower Issaquah Valley Regional Setting, Page 2-1, 1st paragraph: The District's extraction of groundwater for potable municipal supply should also be mentioned in this section.

Response: Will add text to note that SPWD also withdraws groundwater from the same aquifer.

2.5.3.2 Beneficial Use, Page 2-10, 1st paragraph: This appears to be the first mention of Sammamish Plateau Water & Sewer District groundwater extraction, with a statement that no migration pathway is confirmed. The District's groundwater extraction for municipal water supply purposes should be mentioned earlier in Section 2.1 and evidence should be provided to support the statement “unconfirmed migration pathway”, as a migration pathway is suspected. (See Sammamish Plateau Water’s December 17, 2025 comment letter to Ecology on the EFR/IVES Remedial Investigation Work Plan)

Response: Will add text to note that SPWD also withdraws groundwater from the same aquifer. Also, revise unconfirmed to “potential”.

3.3 Summary of Pilot Test Results, Page 3-2, 1st paragraph: PlumeStop reagent was observed in groundwater at NWN-MW10 and therefore this well should no longer be considered representative of downgradient conditions. See also comments below on Table 7.

Response: Will review condition of NWN-MW10 and propose an alternative monitoring point as appropriate.

4.2 Contaminants of Potential Concern, Page 4.2, Bulleted lists: Lists of detectable PFAS are limited because the majority of PFAS in fluorotelomer AFFF are not detected via targeted

methods, but represent precursors that will transform into PFAS of regulatory concern. Some acknowledgement of the limits of this list should be made.

Response: Will clarify laboratory-detectable PFAS compounds

4.2 Contaminants of Potential Concern, Page 4.2, Bulleted lists: Currently available extraction methods for soils can quantify a small amount of PFAS in comparison to what is typically encountered at AFFF sites. Some acknowledgement of this limitation should be made, with potential reference to Nickerson et al., 2020 and Gonda et al., 2024. Links provided as follows: (<https://pubs.acs.org/doi/10.1021/acs.est.0c00792>) (<https://link.springer.com/article/10.1007/s00216-024-05585-2>). See also comment below re Section 6.2.

Response: We acknowledge that U.S. EPA analytical methods do not quantitate all known PFAS compounds; however, no EPA approved total oxidizable precursor method has been promulgated to date. The Interim Action Work Plan will be revised to incorporate limited testing using EPA 1621 as appropriate to evaluate mass -balance of PFAS.

5.2.1 Description of Work Elements and Sequence of Activities, Page 5-2, 1st Bullet and all subsequent references to total PFAS: In reference to 1 mg/kg total PFAS; total would include nontarget analysis and appropriate extraction to understand PFAS associated with soil. Without base-acid sequential extraction and TOP Assay / Total Organofluorine, it is not possible to say total PFAS. It is likely this means ΣPFAS40 from the 1633A method list and should be caveated accordingly or, ideally, proper characterization should be performed.

Response: The Interim Action Work Plan will be revised to identify the analytes comprising the 1 mg/kg remediation level.

5.2.2.1 Soil, Page 5-2, Last paragraph: Some acknowledgement should be made that the proposed remediation level of PFAS ≤ 1 mg/kg, which exceeds screening levels that are protective of human health and the environment, will result in soils above screening levels remaining in situ and insufficiently characterized due to method limitations. Also, asphalt has a degree of permeability and should not be referred to as impervious.

Response: Soils above Site remediation levels will remain on-site and will be encapsulated by means described in the Interim Action Work Plan. Completion of the interim action does not reduce or otherwise negate the requirement of the final cleanup action, selected by Ecology after the Feasibility Study process as specified in the Agreed Order, to be protective of human health and the environment and address all potential transport and exposure pathways. Performance of the interim action, identified through the planned performance monitoring program, would be considered as part of identifying and developing the alternatives considered for Ecology's final cleanup action for the Site.

The Interim Action Work Plan will be revised to remove the word 'impervious' regarding asphalt cap.

5.2.3 Expansion of PRB, Page 5-3, 1st Sentence: The interim action report, as written, seems presumptive of Regenesys' PlumeStop as the selected product for full scale implementation

regardless of the results of the bench testing. This may turn out to be at a greater cost because of the reliance upon a single option. The use of i.e., (or "namely") seems to impose bias towards PlumeStop at a time when all remedial options should be considered; using e.g., (or "for example") and then listing a technology provider's specific product would be more appropriate. Importantly, for injected adsorbents, there are other options that should be evaluated before proceeding with the interim action.

Response: Additional bench testing would be in addition to the bench testing already specified as part of the Interim Action Work Plan and would delay implementation of the interim action. Section 5.2.4, Bench Testing indicates the final bench testing will be performed to identify the appropriate product dosing rate and efficacy of the treatment approach. Unless bench testing indicates the proposed approach would not be effective, and further evaluation is required, replication of the same test across multiple treatment products is beyond the scope of the interim action.

5.2.4 Bench Testing and 6.2 Soil Performance Monitoring, Pages 5-3 and 6-1, Whole Section;

2nd paragraph, last sentence: If a bench-test is to be performed, other products should be considered instead of favoring only one proprietary product. There are several options for stabilizing agents that could be incorporated into the bench-testing for an unbiased assessment, and in a way that minimizes additional laboratory costs.

Response: Additional bench testing would be in addition to the bench testing already specified as part of the Interim Action Work Plan and would delay implementation of the interim action. Section 5.2.4, Bench Testing indicates the final bench testing will be performed to identify the appropriate product dosing rate and efficacy of the treatment approach. Unless bench testing indicates the proposed approach would not be effective, and further evaluation is required, replication of the same test across multiple treatment products is beyond the scope of the interim action.

5.2.4 Bench Testing and 6.2 Soil Performance Monitoring, Pages 5-3 and 6-1, Whole Section;

2nd paragraph, last sentence: At the proposed allowable soil concentration of 1 ppm, leaching at 95% would result in groundwater concentrations of 50,000 ppt. This is several orders of magnitude greater than groundwater screening levels in Table 2. More effective leaching inhibition is achievable when considering other stabilizing agents such as RemBind, FluoroSorb, and zeolites.

Response: The remediation level of 1 mg/kg identifies the area directly treated with additional in-situ stabilization product and does not indicate the total extent of the interim action. Although the remediation level does leave some residual material in-situ as stated, the interim action proposes to address the leaching pathway with additional treatment in the PRB and further reduce the mobility of PFAS with capping the source area.

Completion of the interim action does not reduce or otherwise negate the requirement of the final cleanup action, selected by Ecology after the Feasibility Study process as specified in the Agreed Order, to be protective of human health and the environment and address all potential transport and exposure pathways. Performance of the interim action will be monitored

following completion of construction to evaluate whether further cleanup actions are required.

5.2.6 Excavation and In Situ Stabilization of PFAS Contaminated Soil, Page 5-4, 2nd sentence, 1st paragraph: Please specify the name and location of the Subtitle C TSD for verification of requirements in accordance with 2024 EPA Destruction and Disposal Guidance.

Response: Final TSD facilities will be confirmed once final bids for excavated soil transport and disposal have been received and reviewed. Any facility selected will be properly licensed to receive the soil as profiled, in accordance with the Resource Conservation and Recovery Act.

6.2 Soil Performance Monitoring, Page 6-1, 1st sentence, 1st paragraph: Some acknowledgement should be given that standard target methods were used which are known to underestimate PFAS associated with soils impacted by historical use of AFFF

Response: The revised Interim Action Work Plan will be revised to acknowledge the limitations of currently approved EPA analytical methods.

6.3 Soil Confirmation Monitoring and Appendix B, Section 6.3, Page 6-1: Performance for ISS is based on achieving homogeneous and uniform distribution of the stabilizing agent throughout the treated area. While PFAS analytical performance monitoring data is likely not necessary due to pre-design bench-testing, confirmatory monitoring throughout the implementation that shows homogeneous and uniform distribution of the stabilizing agent was achieved is warranted and should be detailed in these sections

Response: The revised Interim Action Work Plan will include a description of construction monitoring methods to maximize uniformity of stabilizing agent distribution.

Figure 13, Fig 13, Legend: It is presumptive to refer to the interim PRB as the “Full Scale PRB.” Interim action language should be maintained.

Response: The Interim Action Work Plan will be revised to identify the work as the Interim Action PRB.

Table 7 NWN-MW10 Data: This "downgradient" location of the pilot test had evidence of PlumeStop in the well as of October 2021. Recent data provided for 2023 (within 2 years) suggests PFAS concentrations may be increasing. If more recent data is available, it should be provided. Evaluating this pilot test data objectively is important for understanding the long-term effectiveness of this interim action and its design.

Response: Performance monitoring data for NWN-MW10 is provided in the draft Interim Action Work Plan. Long term compliance monitoring will be addressed through the Performance Monitoring Program for the interim action and will inform final remedy development and selection through the FS process.

Table 9 NWN-MW10 Data: The field parameters appear to show a definitive shift (Dec 2022 and Feb 2023) suggesting that something is influencing the results or the effectiveness of the PRB is decreasing. This should be discussed when considering expanding the pilot test to an interim action.

Response: The interim action final design and implementation will incorporate available monitoring data collected as part of the pilot study and Remedial Investigation groundwater monitoring program as appropriate.

Appendix B, Section 4, Page 4-1: Some justification should be provided for why colloidal activated carbon was selected over reasonable equivalent options. It seems unfairly presumptive to only discuss colloidal activated carbon when a proper feasibility study has not yet been performed.

Response: Completion of the interim action does not reduce or otherwise negate the requirement of the final cleanup action, selected by Ecology after the Feasibility Study process as specified in the Agreed Order, to be protective of human health and the environment and address all potential transport and exposure pathways.

Results of performance monitoring of the interim action identified through the planned performance monitoring program, would be considered as part of identifying and developing the alternatives considered for Ecology's final cleanup action for the Site. Following the interim action, the results of the Remedial Investigation and Feasibility Study process will be reported to Ecology for its Cleanup Action Plan.

Appendix B, Section 5.1, Page 5-1, 1st sentence, 1st paragraph: Using "or equivalent" when a specific product is specified is incorrect. More appropriate terminology would be "or approved equal;" however, it appears no formal pragmatic comparison was performed and PlumeStop is the presumptive remedy.

Response: Remove equivalency language, as more appropriate for a final Feasibility Study.

Appendix B, Section 5.2, Page 5-2, 2nd sentence, 2nd paragraph: 10% for swell seems low, especially with a higher percentage of silts/clays in the shallower soils. Some justification in a design should be provided, or some geotechnical consideration should be given before specifying an approximate swell attributable to both stabilizer addition and clay hydration.

Response: Additional geotechnical testing and analyses will be performed as required to finalize the design of the interim action from the initial 30-percent design presented in Appendix B.

Appendix B, Section 5.5, Page 5-5, 1st paragraph, 2nd sentence: The term "full-scale" is used for this interim action and seems inappropriate, especially since a feasibility study has not been performed.

Response: The Interim Action Work Plan will be revised to use the description Interim Action PRB.

Appendix B, Section 5.5, Page 5-5, 3rd bullet: Extending the injected PRB into the unsaturated/infrequently saturated zone is a deviation from the pilot study and this should be specifically stated to avoid confusion that the interim action for the PRB is merely an extension of the pilot test.

Response: The Interim Action Work Plan currently states how the injection program will be carried out and baseline assumptions for the design and estimated cost. Additional

documentation will be provided with the final design following completion of the data collection and bench testing process as appropriate.

Appendix B, Section 5.5, Page 5-5, 3rd bullet: The performance monitoring plan, as described, does not seem to have a way of assessing the **technical necessity** of extending the injected PRB into the unsaturated zone. This represents an expanded scope as part of an interim action that does not meet the objectives defined in the Agreed Order, which states "*...an interim action is a remedial action that is **technically necessary** to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance, that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed, or that is needed to provide for completion of a site hazard assessment, remedial investigation/feasibility study, or design of a cleanup action plan.*" (see Ecology Agreed Orders for EFR/IVES and MF/RT, Section 6.7, emphasis added).

Response: Application of CAC in the vadose zone has been identified as within the scope required to treat any localized mobilization of PFAS associated with seasonal fluctuations in groundwater elevation. As described in the draft Interim Action Work Plan soil remaining in the vadose zone will also be treated directly with the selected carbon amendment offering direct treatment of source material as well as additional reactive capacity beyond the edges of the proposed excavation area.

Performance monitoring will evaluate the ongoing effectiveness of the proposed interim action for compliance with final cleanup levels.

Appendix B, Section 5.5.1, Page 5-6, Middle of 3rd paragraph: The statement "...higher volume of injectate solution will be required in unsaturated than saturated..." while seemingly intuitive that unsaturated zone injections may vertically accommodate more fluid resulting in localized mounding, some parameter based justification for this is necessary. Injected fluid within the saturated zone should be volumetrically equivalent, but may require more pressure to achieve displacement of liquid versus air in the unsaturated zone.

Response: The Interim Action Work Plan specifies estimated volumes in unsaturated (55-gallons) and saturated soil (40-gallons). Both values are approximate and subject to field verification of product placement to ensure PRB construction meets design requirements.

The Interim Action Work Plan will be revised to note that specific pumping and pressure requirements will be monitored and refined during construction to meet design requirements.

Appendix B, Section 5.5.1, Page 5-7, 1st paragraph: First, an injection concentration is specified in Table 8 for both the vadose injection and saturated injection. Second, the design does not appear to have been collaboratively developed if the reagent manufacturer is free to specify whatever injection concentration they decide with no design basis specified.

Response: The Interim Action Work Plan will be revised to incorporate the concentrations reported in Table 8.

Appendix B, Section 5.5.1, Page 5-6, 1st paragraph: This section needs to include the design calculations supporting the length, width, and depth of the PRB. In Section 5.5.2 (page 5-7), it seems like 12 additional injection points are being added to increase the thickness of the PRB from the pilot test, which may indicate that the groundwater migration was not appropriately considered during the pilot test and should be confirmed for the interim action plan.

Response: The Engineering Design Report will be revised to note that the pilot test results indicated high efficacy removing PFAS from groundwater and adding additional PRB thickness will further increase reactive capacity and longevity of the proposed Interim Action PRB.

Appendix B, Section 5.5.1, Page 5-6, 3rd paragraph: The text needs to specify if any changes were made to the effective porosity assumptions based on pilot test observations.

Response: The Engineering Design Report will incorporate pilot test observations reported in the PFAS Pilot Test Summary Report as appropriate.

Appendix B, Section 5.5.1, Pages 5-6 to 5-7: No discussion or consideration of the site geochemistry appears to have been included as a design parameter. Naturally occurring species (like organic carbon) will compete with PFAS to sorb onto the injected remedial product and can directly influence its useful life prior to PFAS breakthrough.

Response: Geochemistry was previously considered and incorporated into the pilot test design (Farallon 2022). The Compliance Monitoring Plan provided in Appendix H will be revised to indicate geochemical parameters will be periodically evaluated as part of performance monitoring.

Appendix B, Section 5.5.1, Pages 5-6 to 5-7: It is well known that an injected sorbent will have an upper threshold for PFAS adsorption that is expected to be exhausted eventually. Data from the pilot test (and the apparent increasing PFAS concentrations at NWN-MW10) should be used to provide some estimate of when PFAS will breakthrough the PRB. Further, it should be clearly stated that breakthrough concentrations of PFAS may exceed the maximum influent concentrations due to "roll over" or desorption of previously sorbed PFAS, threatening downgradient receptors.

Response: While all reactive media may eventually be exhausted, the Interim Action Work Plan will be revised to indicate the design will incorporate sufficient reactive capacity to treat all PFAS source material with a sufficient factor of safety to meet the permanence requirements identified under MTCA.

Carey et al. 2022 indicated that PRB effectiveness may be accurately estimated through bench-scale testing supporting full-scale design including estimated barrier lifespan. Some shadowing effects and/or variability in the groundwater quality reported at monitoring well NWN-MW10 were anticipated at the time of the pilot test because the test does not extend across the full downgradient edge of the EFR Source Area.

Performance monitoring during both the interim action and eventual Feasibility Study and final approved Cleanup Action Plan, as well as contingency plans incorporated into the Cleanup

Action Plan, will monitor and evaluate the ongoing effectiveness of both this interim action and future final remedies and provide protection to downgradient receptors.

Appendix B, Section 5.5.2, Page 5-7, 3rd paragraph, Last sentence: Given Mohr's circle and the propensity for fracture propagation in porous media to parabolically migrate upwards to ground surface, a "bottom up" approach should at least be considered for more reliable distribution. Injection contractors prefer top down because if surface at the annulus of the borehole is observed, advancing the injection rods strengthens the "seal" around the injection point, but this short-changes the designated injection interval. Furthermore, 20 to 100 psi is sufficient to initiate hydraulic fractures within porous media with a high sand content at depths of 6 to 26 feet because of the friction angle (i.e., not purely based on the mass of overburden soils).

Response: Injection and emplacement methods will be evaluated with the Contractor to provide the best distribution and effectiveness based on Site conditions. The Interim Action Work Plan will be revised to address alternative injection methodologies as appropriate.

Appendix B, Section 5.6.1, Page 5-10, 2nd full paragraph, 1st sentence: It seems like a presumptive decision has already been made to use PlumeStop, and now SourceStop. Alternatively, SourceStop could be one product fairly considered at the bench-scale versus other options that could be more economical and have equal or superior performance.

Response: PlumeStop and SourceStop are under consideration for application by injection and mechanical mixing, respectively.

The Interim Action Work Plan notes that SourceStop or an equivalent product will be used, based on bench scale testing results. Unless bench testing results indicate the selected product will not provide sufficient reactive capacity or performance, additional bench testing for multiple treatment products is beyond the scope of the interim action.

Appendix B, Section 5.6.1, Page 5-10, Last paragraph: While bench-testing will ultimately provide a design basis for selecting a stabilizer concentration, a minimum stabilizer concentration of 1 percent by dry soil weight should be required because anything less can present too much uncertainty for justifying the cost of mobilizing to do the work. Insufficient dosing can end up sacrificing effectiveness or costing the project more money to remobilize and remix the soil.

Response: The Interim Action Work Plan will be revised to indicate the final dosage rate will be confirmed through bench testing and selection of an appropriate factor of safety to ensure sufficient reactive capacity to meet permanence requirements specified under MTCA.

Appendix B, Section 5.6.1, Page 5-10, Last paragraph: SourceStop (and activated carbon regardless of particle size) is an aDsorptive process, not an aBSorptive process. This is important to specify because a weakness of injected sorbents is a limit of surface area and eventual desorption of concentrated PFAS in light of continued mass flux.

Response: The Interim Action Work Plan will be revised to correct this typographical error.

Appendix B, Section 5.6.1, Page 5-10, Last paragraph: No discussion or consideration of the site geochemistry appears to have been included as a design parameter. Naturally occurring species (like organic carbon) will compete with PFAS to sorb onto the stabilizing agent.

Response: General geochemistry was evaluated as part of the pilot test design process. Results were provided in the PFAS Pilot Test Summary Report (Farallon 2022). Geochemical parameters will be considered as part of the final design.

Appendix B, Section 5.6.2, Page 5-11, 1st full paragraph on page: SPLP is unrepresentative of leaching conditions in real-world scenarios and may create an unfavorable leaching condition given unrealistic disturbance and soil to liquid ratio. It presents a very aggressive leaching condition. An alternative may be LEAF 1314, 1315, or 1316, which are a series of leaching approaches that are more realistic and have been considered/tailored for PFAS recently.

Response: Further review of alternative leaching analytical methodologies may be performed to evaluate whether less aggressive testing and design criteria are appropriate as part of column testing.

Appendix B, Section 5.6.2, Page 5-11, 1st full paragraph on page: TCLP is an inappropriate tool to assess PFAS leaching for waste disposal criteria. TCLP uses an acidic pH, which promotes anionic sorption to soil and underrepresents the leaching potential. SPLP would be a better assessment than TCLP, but LEAF 1314 may be the most realistic.

Response: Disposal criteria and testing are specified by the disposal facility permit and Resource Conservation and Recovery Act requirements. Profiling may be adjusted as required by the facility and applicable regulations.

Appendix B, Section 5.6.2, Page 5-11, 1st paragraph: We suggests including particle size distribution and Atterberg limits into the bench-testing work as these results from these analyses will be informative for the design.

Response: Geotechnical testing will be considered and performed as recommended by a qualified person as part of final design.

Appendix B, Section 5.6.5, Page 5-13, 2nd paragraph: Relying upon Regenesis for protocols for soil mixing is ill advised. They are a product supplier. A qualified geotechnical engineer should specify soil mixing protocols to apply requisite force and qualitative performance monitoring (like particle size reduction and mix uniformity) for assessment. Regenesis will evidently provide concentration (which may likely be in the 2% to 3% per dry weight range), but they should not be entrusted to specify soil mixing protocols unless they are provided by a Regenesis licensed geotechnical engineer.

Response: Mixing means and methods and quality control criteria will be incorporated into the final Engineering Design Report.

Appendix B, Section 5.6.6, Page 5-13 to 5-14: Prior to installing the asphalt cap and after compaction testing is complete, it may be advisable to wait a few weeks to a couple months for self-settlement - especially if added liquid is required during soil mixing. ~10 to 12 feet of soil

mixing (even following compaction) could result in inches worth of settlement resulting in depressions within the asphalt cap

Response: Backfill and compaction design criteria will be specified as appropriate by a qualified person and addressed as part of the final Engineering Design Report.

Appendix B, Section 5.10, Page 5-4: An excavation of this size with staged spoil piles in the Pacific Northwest may need some consideration for precipitation and runoff concerns (tarps, earthen berms, etc.). This is not the same as Section 5.6.7 which appropriately plans for increased runoff following the installation of the cap; this is for earthwork if a rainstorm is encountered.

Response: Stormwater management will be addressed as part of final engineering design and and/or procurement of a Construction Stormwater General Permit as appropriate.

Appendix B, Section 5.12.1, Page 5-6,1st paragraph: Unsaturated zone excavation has the potential to create dust that needs to be managed by the Contractor. OSHA specifications should be used, and a dust monitoring plan is needed. The language here is too flexible and requires quantitative metrics for exposure concerns.

Response: Dust control and suppression will be addressed as part of final engineering design.

Appendix – Comments in Original Format

I-1: Jesse LeGault

Submit Date: 10/22/2025 9:11 AM

Submit Method: Website

Comment I-1-1

I think this project is a great idea and I support proactively removing the pollutants in the water supply.

I-2: Dean Kerekes

Submit Date: 10/24/2025 2:12 AM

Submit Method: Website

Comment I-2-1

I have no knowledge of existing cleanup practice but why would we continue to allow fire emergency agencies to continue to store and utilize PFAS containing foam. There are very good alternative available...I recommend and replaced these in 2018 in all the automated fire suppression systems at a major household manufacturing company

I-4: Peter Hansen

Submit Date: 10/27/2025 9:29 AM

Submit Method: Website

Comment I-4-1

My child attends Issaquah Valley Elementary, one of the cleanup sites. I am uncomfortable regarding his possible exposure to PFAS chemicals when he plays at recess. He has told me how kids will sometimes dig in the dirt.

I-5: Emily Jones

Submit Date: 11/30/2025 2:46 PM

Submit Method: Website

Comment I-5-1

I am submitting a comment regarding the EFR HQ IVES Cleanup site.

After reviewing SEPA 202504352, I appreciate the implementation of protective measures, such as the expansion and soil stabilization of the permeable reactive barrier (PRB). To promote transparency among all stakeholders, I recommend that monitoring results be made publicly available.

According to Lyu et al. (2022), there is an emphasis on the necessity of long-term monitoring due to the persistence of PFAS and the risk of plume rebound. I suggest that SEPA 202504352 incorporate a clearly defined groundwater monitoring schedule.

"Given PFAS persistence and mobility in subsurface environments, long-term groundwater monitoring is

critical. I recommend at least a 10-year post-installation monitoring plan, with annual public reporting, to ensure the PRB continues to meet remediation goals." (Lyu et al. 2022)

Org-1: Sammamish Plateau Water (John Krauss)

Submit Date: 12/18/2025 12:07 PM

Submit Method: Email

Comment Org-1-1



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Sammamish, WA 98075

Main: 425.392.6256
Fax: 425.391.5389

www.spwater.org

December 18, 2025

Kimberly Wooten
Northwest Region Section Manager
Toxics Cleanup Program
Washington State Department of Ecology
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Shoreline, WA 98133-9716
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Vance Atkins, Site Manager
Washington State Department of Ecology
PO Box 330316
Shoreline, WA 98133-9716
Vance.Atkins@ecy.wa.gov

Re: Comments on EFR/IVES PFAS Site Draft Interim Action Work Plan and SEPA
DNS/Checklist
Ecology Cleanup Site ID: 16581

Dear Ms. Wooten and Mr. Atkins:

Introduction

Sammamish Plateau Water and Sewer District (the District or Sammamish Plateau Water) is commenting on two related documents from the Department of Ecology (Ecology) related to the Eastside Fire and Rescue Headquarters and Issaquah Valley Elementary School cleanup site (EFR/IVES, Site ID: 16581). The first is the draft Interim Action (IA) work plan, and the second is the checklist and Determination of Nonsignificance (DNS) under the State Environmental Policy Act (SEPA).

Consistent with its previous comments on interim actions proposed for this Site, the District believes that the draft IA work plan and associated SEPA review documents lack sufficient information and evaluation on what appears intended to be part of the permanent remedial action for the Site. Specifically:

- They lack adequate information on the mass of PFAS present at the EFR headquarters site that is to be addressed by the interim action, and related evaluation of the effectiveness of the proposed sequestration treatments including effectiveness over time;
- They lack consideration and evaluation of alternatives to the proprietary treatments being proposed;
- They lack evaluation of the proposed treatment of vadose zone soils, which was not included in the pilot test;
- They lack evaluation of impact on remedial options in the event that the Interim Action fails, including through breakthrough or contaminant “roll over;” and
- They lack identification of or planning for potential contingencies in the event of remedy failure.

As a result, the draft IA work plan does not satisfy requirements of the Model Toxics Control Act (MTCA), and the SEPA review fails to provide information and evaluation required to support issuance of a DNS.

Accordingly, Ecology should not approve the draft IA work plan. Instead, Ecology should require revisions to address the comments and concerns raised in this letter and attachments. It should also withdraw the SEPA DNS and not revisit SEPA review until concerns raised here are addressed in a revised IA work plan. Given the significance of this proposed action for the Lower Issaquah Valley Aquifer (LIVA) and the many thousands of people who rely upon it for potable water supply, early scoping for SEPA review would be appropriate.¹

As always, the District remains available to collaborate with Ecology to ensure that any IA will in fact improve conditions at the Site without creating unintended risks that could adversely impact the LIVA or jeopardize later efforts to cleanup of the Site.

District’s June 2024 comments on LIVA PFAS Agreed Orders

As part of its ongoing engagement with Ecology, Eastside Fire and Rescue, and the City of Issaquah, the District submitted detailed comments in June 2024 on the Agreed Order for the EFR/IVES Site.²

¹ See WAC 197-11-262(1) (“The purpose of early scoping is to identify possible environmental issues prior to making a threshold determination.”).

² June 4, 2024 letter from John Krauss, Sammamish Plateau Water, to Brett Carp, Ecology, re Public Comment on Agreed Orders for the Lower Issaquah Valley PFAS Cleanup Sites Eastside Fire & Rescue Headquarters / Issaquah Valley Elementary Site (Site ID 16581) Rainier Trail & Memorial Field Site (Site ID 16582).

The letter explains the District's interests as a major public water purveyor that relies on the LIVA as its primary source of supply. As a result of PFAS contamination at two of the District's production wells (wells 7 and 8), the District stopped production from the wells in 2017, and in 2021 obtained authorization from Ecology to pump the authorized quantities for those wells from its well 9. Wells 7 and 8 continue to exhibit PFAS contamination well above applicable screening levels. Ecology has recognized the District's interests in the LIVA PFAS sites through its fact sheets and mailers, and through its water rights permitting process, all of which identify the District's south zone, and specifically, wells 7 and 8, as impacted by PFAS contamination associated with the EFR/IVES Site.³

Ecology is also working with the District to install a treatment system to address PFAS contamination in wells 7 and 8. Ecology is providing partial funding for the capital costs of installing treatment. However, the District and its customers are providing the majority of the funding for capital costs, and will be responsible for all ongoing O&M costs, which will be substantial.

Given these critical interests, the District supports timely and efficient investigation and cleanup of the LIVA PFAS sites consistent with MTCA. Accordingly, the District's June 2024 comments expressed a number of concerns with the interim action proposed in the EFR/IVES Agreed Order, including that:

- Any proposal for a permeable reactive barrier (PRB) needs to demonstrate that it will not foreclose reasonable alternatives for permanent cleanup at the Site;
- The IA work plan should describe alternative interim actions considered and explain why they were not selected;
- The IA work plan should evaluate the impacts of injecting PFAS sequestration compounds deep into the aquifer, including performance effectiveness after the sequestration media in the PRB becomes saturated with PFAS;
- The IA work plan should evaluate the long-term effects of saturated media on the aquifer and groundwater quality; and
- The IA work plan should include appropriate contingency plans for responding to remedy failure, such as saturated media becoming a source of future groundwater contamination.

Ecology's August 2024 response to District's Agreed Order comments

Ecology responded to the District's comments in August 2024. Ecology acknowledged the District's engagement on the sites over time, including its submission of data on the

³ See, e.g., EFR HQ IVES Cleanup Site Fact Sheet, Publication 25-09-180 at Fig. 2 (Ecology, 2025), and Final Report of Examination for a Water Right Change, Change Application CG1-00289C@1 (Ecology, 2021).

District's wells to help with the overall understanding of the sites, and expressed Ecology's interest in continuing to work with the District "as the project progresses." ⁴ With regard to the Interim Action, Ecology stated as follows:

We acknowledge that the language in Appendix C related to the permeable reactive barrier implied an Interim Action had already been selected, when it has not. We have updated the language accordingly. An Interim Action work plan will go out for public comment prior to the implementation of the Interim Action. We hope that document will answer many of the questions you raise in these comments, and we appreciate any additional comments you may have on the document at that time.

September 2025 EFR/IVES Site Interim Action Work Plan and SEPA DNS/Checklist

Based on Ecology's response to the District's comments on the Agreed Order discussed above, the District expected the draft Interim Action work plan would address the concerns the District has repeatedly raised about the reactive barrier employed in the pilot test and proposed for significant expansion in the Interim Action. Unfortunately, the draft IA work plan does not satisfy these expectations.

The District's consultants, CDM Smith, developed the attached detailed comments on the draft Interim Action work plan and the SEPA DNS/checklist. In sum, the District is concerned that the draft work plan and current SEPA checklist/DNS do not provide adequate information or evaluation of the many uncertainties associated with this significant project affecting the aquifer that tens of thousands of residents of the Issaquah Valley and Sammamish Plateau rely upon for their drinking water.

Before proceeding with this proposed interim action Ecology should pause, evaluate alternatives, and fully evaluate the effects of any action on the aquifer, the communities that rely upon it, and on future cleanup options. Ecology should also identify contingencies in the event that this relatively new proprietary treatment – the purpose of which is to indefinitely or permanently sequester PFAS in the aquifer – fails. The IA work plan should include contingency plans. Until these steps are taken, the Interim Action work plan and SEPA review are incomplete and inconsistent with MTCA⁵ and SEPA.⁶

⁴ Washington Department of Ecology, Responses to Comments, Draft Agreed Orders, Lower Issaquah Valley PFAS Cleanup Sites, August 2024, at p. 19.

⁵ See, e.g., WAC 173-340-430(3)(b) (interim action shall not foreclose reasonable alternatives for the final cleanup action); WAC 173-340-430(4)(a) ("[S]ufficient technical information must be available regarding the facility to ensure the interim action is appropriate and warranted."); and WAC 173-340-430(7)(b)(ii) (IA work plans must include "Alternative interim actions considered and an explanation of why the proposed alternative was selected.").

⁶ See, e.g., WAC 197-11-030(2)(c) (SEPA documents should be "...concise, clear, and ... supported by evidence that the necessary environmental analyses have been made."); and WAC 197-11-060(4)(c) (SEPA documents

Sammamish Plateau Water's Continuing Concerns with Draft Interim Action Work Plan and SEPA DNS/Checklist

There are significant uncertainties and unknowns with the current site characterization and with the proposed permanent application of proprietary remedial action products as an “interim” action. The IA work plan and SEPA review needs to be supported with factual evidence (information/data) and include objective statements recognizing the large number of unknowns related to this interim action, some of which should be addressed with more preliminary design investigations, additional pilot and bench-scale testing, and ongoing monitoring evaluation of the previously implemented pilot test to improve the design before rushing into this action of such scale and permanency. These steps are fundamental to standard remedial design practices that are being overlooked for an action characterized by the qualified term “Interim,” but which is effectively permanent: it would be difficult if not impossible to reverse the injections into the aquifer in the event of remedy failure.

Uncertainties and unknowns that should be investigated, evaluated and presented before implementing this very large and permanent “interim” action include:

- **The presence (in terms of mass) of PFAS precursor chemicals.** PFAS precursor constituents likely exist in soils at the Site that are planned to be left in place post interim action. These precursors can, over time, transform into PFAS constituents at concentrations of regulatory concern. Further sampling and characterization should be conducted to estimate the mass of PFAS at the Site, including precursor chemicals.
- **The effectiveness of the current pilot tested barrier wall.** A critical and objective review on the performance of the EFR/IVES pilot test and any effectiveness issues and lessons learned from this smaller scale pilot test is crucial to informing the design of this Interim Action, which proposes using the same construction methods and coagulated activated carbon (CAC)-based proprietary product on a more expansive scale. For example, the draft Interim Action work plan proposes a line of injection locations to increase the thickness of the pilot test barrier wall. This suggests that predesign calculations, models, and/or estimates were lacking, or that observations from the pilot have not been effectively communicated. The District has previously raised concerns about contaminant breakthrough and believes the IA work plan requires a much more detailed analysis before proceeding.

require careful consideration of “...the range of probable impacts, including short-term, long-term, direct, indirect and potential cumulative effects.”).

- **The constructability, necessity and impacts (good/bad) of injecting the CAC into the vadose zone.** As pointed out in the attached detailed comments on the Interim Action work plan, injection of CAC into the vadose zone was not performed in the pilot test and is a significant unknown. A separate small-scale pilot test should be performed to evaluate and inform the design before performing this at the scale proposed in the Interim Action. Relevant and tangible performance metrics need to be assigned to the vadose zone injection to confirm delivery of CAC and reductions in vadose zone to groundwater leaching. Currently, no performance metrics are presented or considered to evaluate this significant unknown and the necessity of this injection to the vadose has not been demonstrated, which is a requirement for Interim Actions under MTCA.⁷
- **Bench Testing of other media types.** The current plan and design for soil stabilization and expanded aquifer injections is proposing to use CAC. There are several other media that may be more economical and effective. These should be considered through bench testing before moving forward with the CAC-based product sold by the same vendor (Regenesis) that is playing a significant role in the design.
- **A contingency plan to address any issues or failure of the interim action.** The current IAWP is void of any descriptions of logical contingency plans in the event the interim action is found (through performance monitoring) to be failing or underperforming relative to design objectives. This should be developed with iterative logic that addresses any failures of the design components critical for meeting interim action objectives over the period of the time the remedy components are intended to be performing, which for the permeable reactive barrier wall (PBR) is indefinite. This contingency planning is critical for the proposed PBR due to the potential that, at some point in time, the concentrating PFAS within the barrier wall could lead to higher concentrations in groundwater downgradient of the barrier wall due to competitive desorption by other constituents in groundwater (something colloquially referred to as “roll over”).

⁷ See WAC 173-340-430(1)(a) (interim action is “A remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance at a facility.”)

Conclusion

As Ecology is aware, the District supports timely and efficient investigation and cleanup of the LIVA PFAS sites consistent with MTCA.⁸ We know Ecology shares these goals, as expressed in part through Ecology's funding for much of the work being performed at the EFR/IVES Site. We therefore look forward to Ecology working to revise the Interim Action work plan and associated SEPA review to address the District's significant comments and concerns.

We also look forward to continuing to collaborate with Ecology on these important efforts. As has always been the case, the District would be happy to make its consultants available to Ecology to discuss the proposed Interim Action, our comments, and any other technical concerns related to the LIVA PFAS sites.

Sincerely,



John C. Krauss
General Manager

Cc:

Kristen Forkeutis, Ecology
Scott Coffey, CDM Smith
Matt Wells, Foster Garvey

Attachment: CDM Smith December 18, 2025 Review and Comments on Draft Interim Action Work Plan for EFR/IVES Site and Associated SEPA DNS/Checklist, Ecology Cleanup Site ID: 16581

25-12-37

⁸ See, e.g., December 17, 2025 letter from John Krauss, Sammamish Plateau Water, to Vance Atkins, Ecology, re Lower Issaquah Valley PFAS Site Remedial Investigation Work Plans, Ecology Cleanup Site ID: 16581 – Follow up and Request for Meeting.



500 Union Street, Suite 600
Seattle, WA 98101
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December 18, 2025

Jay Krauss
General Manager
Sammamish Plateau Water
1510 228th Avenue SE
Sammamish, WA 98075

Subject: CDM Smith Review and Comments on Draft Interim Action Work Plan for EFR/IVES
Site and Associated SEPA DNS/Checklist
Ecology Cleanup Site ID: 16581

This letter transmits CDM Smith review comments on the Draft Interim Action Work Plan proposed for the EFR/IVES site and the associated State Environmental Policy Act Determination of Nonsignificance and Checklist for the proposed Interim Action. These comments were prepared by CDM Smith staff with extensive experience with PFAS evaluation and remediation, including subject matter expert Jeffrey McDonough, MS, PE.

Please let me know if you have any questions regarding this transmittal. We appreciate the continued opportunity to work with Sammamish Plateau Water on this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Scott Coffey".

Scott Coffey, LHG
Project Technical Lead
CDM Smith Inc.

Encl.



Comments on the EFR/IVES Interim Action Work Plan

1.0 Introduction, Page 1-1, 1st sentence, 1st paragraph: The text states that Farallon Consulting prepared this IAWP; however, it appears that Regensis performed significant portions of the design as evidenced by their branding on several of the appendices. It should be clearly stated that Regensis performed portions of the design (e.g., ISS and PRB), and that no other comparable remedial products were evaluated or considered.

1.0 Introduction, Page 1-1, 3rd & 4th paragraphs: Historical releases of AFFF have impacted source area soil, source area groundwater, and downgradient groundwater - The City withdraws groundwater as mentioned, but so does the District and this should be acknowledged.

1.3 Regulatory Interactions, Page 1-3, 2nd sentence, 1st paragraph: The text should be revised to specify that MTCA classifies 6 specific PFAS compounds (PFOA, PFOS, PFNA, PFHxS, PFBS, and HFPO-DA), not the entire class of PFAS. Note: It is confusing and imprecise to use the word "list" in reference to hazardous substances as it implies RCRA.

1.4 Abbreviated Class B AFFF Background, Page 1-5, 3rd sentence, 1st paragraph: Note: "PFAS-free AFFF" is a misnomer. For term consistency, the author should refer to the ITRC fact sheet on AFFF (ITRC, September 2023, link: https://pfas-1.itrcweb.org/wp-content/uploads/2023/10/AFFF_PFAS_FactSheet_Sept2023_final.pdf); all AFFF contain PFAS. This is important as the text suggests EFR transitioned to a PFAS-free AFFF, and there may be confusion if training continues to use "PFAS free-AFFF" (which still contains PFAS) and in doing so could compromise the effectiveness of the interim action.

1.4 Abbreviated Class B AFFF Background, Page 1-5, 2nd paragraph: An estimate of historical AFFF discharged onto the EFR site soils should be determined as it is an important factor in understanding the residual PFAS precursors not targeted by current analytical method 1633A that will transform, over time, into PFAS of regulatory concern.

2.1 Lower Issaquah Valley Regional Setting, Page 2-1, 1st paragraph: The District's extraction of groundwater for potable municipal supply should also be mentioned in this section.

2.5.3.2 Beneficial Use, Page 2-10, 1st paragraph: This appears to be the first mention of Sammamish Plateau Water & Sewer District groundwater extraction, with a statement that no migration pathway is confirmed. The District's groundwater extraction for municipal water supply purposes should be mentioned earlier in Section 2.1 and evidence should be provided to support the statement "unconfirmed migration pathway", as a migration pathway is suspected. (See Sammamish Plateau Water's December 17, 2025 comment letter to Ecology on the EFR/IVES Remedial Investigation Work Plan)

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3.3 Summary of Pilot Test Results, Page 3-2, 1st paragraph: PlumeStop reagent was observed in groundwater at NWN-MW10 and therefore this well should no longer be considered representative of downgradient conditions. See also comments below on Table 7.

4.2 Contaminants of Potential Concern, Page 4.2, Bulleted lists: Lists of detectable PFAS are limited because the majority of PFAS in fluorotelomer AFFF are not detected via targeted methods, but represent precursors that will transform into PFAS of regulatory concern. Some acknowledgement of the limits of this list should be made.

4.2 Contaminants of Potential Concern, Page 4.2, Bulleted lists: Currently available extraction methods for soils can quantify a small amount of PFAS in comparison to what is typically encountered at AFFF sites. Some acknowledgement of this limitation should be made, with potential reference to Nickerson et al., 2020 and Gonda et al., 2024. Links provided as follows: (<https://pubs.acs.org/doi/10.1021/acs.est.0c00792>) (<https://link.springer.com/article/10.1007/s00216-024-05585-2>). See also comment below re Section 6.2.

5.2.1 Description of Work Elements and Sequence of Activities, Page 5-2, 1st Bullet and all subsequent references to total PFAS: In reference to 1 mg/kg total PFAS; total would include nontarget analysis and appropriate extraction to understand PFAS associated with soil. Without base-acid sequential extraction and TOP Assay / Total Organofluorine, it is not possible to say total PFAS. It is likely this means Σ PFAS40 from the 1633A method list and should be caveated accordingly or, ideally, proper characterization should be performed.

5.2.2.1 Soil, Page 5-2, Last paragraph: Some acknowledgement should be made that the proposed remediation level of PFAS $\leq$ 1 mg/kg, which exceeds screening levels that are protective of human health and the environment, will result in soils above screening levels remaining in situ and insufficiently characterized due to method limitations. Also, asphalt has a degree of permeability and should not be referred to as impervious.

5.2.3 Expansion of PRB, Page 5-3, 1st Sentence: The interim action report, as written, seems presumptive of Regenesys' PlumeStop as the selected product for full scale implementation regardless of the results of the bench testing. This may turn out to be at a greater cost because of the reliance upon a single option. The use of i.e., (or "namely") seems to impose bias towards PlumeStop at a time when all remedial options should be considered; using e.g., (or "for example") and then listing a technology provider's specific product would be more appropriate. Importantly, for injected adsorbents, there are other options that should be evaluated before proceeding with the interim action.

5.2.4 Bench Testing and 6.2 Soil Performance Monitoring, Pages 5-3 and 6-1, Whole Section; 2nd paragraph, last sentence: If a bench-test is to be performed, other products should be considered instead of favoring only one proprietary product. There are several

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options for stabilizing agents that could be incorporated into the bench-testing for an unbiased assessment, and in a way that minimizes additional laboratory costs.

5.2.4 Bench Testing and 6.2 Soil Performance Monitoring, Pages 5-3 and 6-1, Whole Section; 2nd paragraph, last sentence: At the proposed allowable soil concentration of 1 ppm, leaching at 95% would result in groundwater concentrations of 50,000 ppt. This is several orders of magnitude greater than groundwater screening levels in Table 2. More effective leaching inhibition is achievable when considering other stabilizing agents such as RemBind, FluoroSorb, and zeolytes.

5.2.6 Excavation and In Situ Stabilization of PFAS Contaminated Soil, Page 5-4, 2nd sentence, 1st paragraph: Please specify the name and location of the Subtitle C TSDF for verification of requirements in accordance with 2024 EPA Destruction and Disposal Guidance.

6.2 Soil Performance Monitoring, Page 6-1, 1st sentence, 1st paragraph: Some acknowledgement should be given that standard target methods were used which are known to underestimate PFAS associated with soils impacted by historical use of AFFF

6.3 Soil Confirmation Monitoring and Appendix B, Section 6.3, Page 6-1: Performance for ISS is based on achieving homogeneous and uniform distribution of the stabilizing agent throughout the treated area. While PFAS analytical performance monitoring data is likely not necessary due to pre-design bench-testing, confirmatory monitoring throughout the implementation that shows homogeneous and uniform distribution of the stabilizing agent was achieved is warranted and should be detailed in these sections

Figure 13, Fig 13, Legend: It is presumptive to refer to the interim PRB as the “Full Scale PRB.” Interim action language should be maintained.

Table 7 NWN-MW10 Data: This "downgradient" location of the pilot test had evidence of PlumeStop in the well as of October 2021. Recent data provided for 2023 (within 2 years) suggests PFAS concentrations may be increasing. If more recent data is available, it should be provided. Evaluating this pilot test data objectively is important for understanding the long-term effectiveness of this interim action and its design.

Table 9 NWN-MW10 Data: The field parameters appear to show a definitive shift (Dec 2022 and Feb 2023) suggesting that something is influencing the results or the effectiveness of the PRB is decreasing. This should be discussed when considering expanding the pilot test to an interim action.

Appendix B, Section 4, Page 4-1: Some justification should be provided for why colloidal activated carbon was selected over reasonable equivalent options. It seems unfairly presumptive to only discuss colloidal activated carbon when a proper feasibility study has not yet been performed.

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Appendix B, Section 5.1, Page 5-1, 1st sentence, 1st paragraph: Using "or equivalent" when a specific product is specified is incorrect. More appropriate terminology would be "or approved equal;" however, it appears no formal pragmatic comparison was performed and PlumeStop is the presumptive remedy.

Appendix B, Section 5.2, Page 5-2, 2nd sentence, 2nd paragraph: 10% for swell seems low, especially with a higher percentage of silts/clays in the shallower soils. Some justification in a design should be provided, or some geotechnical consideration should be given before specifying an approximate swell attributable to both stabilizer addition and clay hydration.

Appendix B, Section 5.5, Page 5-5, 1st paragraph, 2nd sentence: The term "full-scale" is used for this interim action and seems inappropriate, especially since a feasibility study has not been performed.

Appendix B, Section 5.5, Page 5-5, 3rd bullet: Extending the injected PRB into the unsaturated/infrequently saturated zone is a deviation from the pilot study and this should be specifically stated to avoid confusion that the interim action for the PRB is merely an extension of the pilot test.

Appendix B, Section 5.5, Page 5-5, 3rd bullet: The performance monitoring plan, as described, does not seem to have a way of assessing the **technical necessity** of extending the injected PRB into the unsaturated zone. This represents an expanded scope as part of an interim action that does not meet the objectives defined in the Agreed Order, which states "*...an interim action is a remedial action that **is technically necessary** to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance, that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed, or that is needed to provide for completion of a site hazard assessment, remedial investigation/feasibility study, or design of a cleanup action plan.*" (see Ecology Agreed Orders for EFR/IVES and MF/RT, Section 6.7, emphasis added).

Appendix B, Section 5.5.1, Page 5-6, Middle of 3rd paragraph: The statement "...higher volume of injectate solution will be required in unsaturated than saturated..." while seemingly intuitive that unsaturated zone injections may vertically accommodate more fluid resulting in localized mounding, some parameter based justification for this is necessary. Injected fluid within the saturated zone should be volumetrically equivalent, but may require more pressure to achieve displacement of liquid versus air in the unsaturated zone.

Appendix B, Section 5.5.1, Page 5-7, 1st paragraph: First, an injection concentration is specified in Table 8 for both the vadose injection and saturated injection. Second, the design does not appear to have been collaboratively developed if the reagent manufacturer is free to specify whatever injection concentration they decide with no design basis specified.

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Appendix B, Section 5.5.1, Page 5-6, 1st paragraph: This section needs to include the design calculations supporting the length, width, and depth of the PRB. In Section 5.5.2 (page 5-7), it seems like 12 additional injection points are being added to increase the thickness of the PRB from the pilot test, which may indicate that the groundwater migration was not appropriately considered during the pilot test and should be confirmed for the interim action plan.

Appendix B, Section 5.5.1, Page 5-6, 3rd paragraph: The text needs to specify if any changes were made to the effective porosity assumptions based on pilot test observations.

Appendix B, Section 5.5.1, Pages 5-6 to 5-7: No discussion or consideration of the site geochemistry appears to have been included as a design parameter. Naturally occurring species (like organic carbon) will compete with PFAS to sorb onto the injected remedial product and can directly influence its useful life prior to PFAS breakthrough.

Appendix B, Section 5.5.1, Pages 5-6 to 5-7: It is well known that an injected sorbent will have an upper threshold for PFAS adsorption that is expected to be exhausted eventually. Data from the pilot test (and the apparent increasing PFAS concentrations at NWN-MW10) should be used to provide some estimate of when PFAS will breakthrough the PRB. Further, it should be clearly stated that breakthrough concentrations of PFAS may exceed the maximum influent concentrations due to "roll over" or desorption of previously sorbed PFAS, threatening downgradient receptors.

Appendix B, Section 5.5.2, Page 5-7, 3rd paragraph, Last sentence,: Given Mohr's circle and the propensity for fracture propagation in porous media to parabolically migrate upwards to ground surface, a "bottom up" approach should at least be considered for more reliable distribution. Injection contractors prefer top down because if surface at the annulus of the borehole is observed, advancing the injection rods strengthens the "seal" around the injection point, but this short-changes the designated injection interval. Furthermore, 20 to 100 psi is sufficient to initiate hydraulic fractures within porous media with a high sand content at depths of 6 to 26 feet because of the friction angle (i.e., not purely based on the mass of overburden soils).

Appendix B, Section 5.6.1, Page 5-10, 2nd full paragraph, 1st sentence: It seems like a presumptive decision has already been made to use PlumeStop, and now SourceStop. Alternatively, SourceStop could be one product fairly considered at the bench-scale versus other options that could be more economical and have equal or superior performance.

Appendix B, Section 5.6.1, Page 5-10, Last paragraph: While bench-testing will ultimately provide a design basis for selecting a stabilizer concentration, a minimum stabilizer concentration of 1 percent by dry soil weight should be required because anything less can present too much uncertainty for justifying the cost of mobilizing to do the work. Insufficient dosing can end up sacrificing effectiveness or costing the project more money to remobilize and remix the soil.

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Appendix B, Section 5.6.1, Page 5-10, Last paragraph: SourceStop (and activated carbon regardless of particle size) is an aDsorptive process, not an aBSorptive process. This is important to specify because a weakness of injected sorbents is a limit of surface area and eventual desorption of concentrated PFAS in light of continued mass flux.

Appendix B, Section 5.6.1, Page 5-10, Last paragraph: No discussion or consideration of the site geochemistry appears to have been included as a design parameter. Naturally occurring species (like organic carbon) will compete with PFAS to sorb onto the stabilizing agent.

Appendix B, Section 5.6.2, Page 5-11, 1st full paragraph on page: SPLP is unrepresentative of leaching conditions in real-world scenarios and may create an unfavorable leaching condition given unrealistic disturbance and soil to liquid ratio. It presents a very aggressive leaching condition. An alternative may be LEAF 1314, 1315, or 1316, which are a series of leaching approaches that are more realistic and have been considered/tailored for PFAS recently.

Appendix B, Section 5.6.2, Page 5-11, 1st full paragraph on page: TCLP is an inappropriate tool to assess PFAS leaching for waste disposal criteria. TCLP uses an acidic pH, which promotes anionic sorption to soil and underepresents the leaching potential. SPLP would be a better assessment than TCLP, but LEAF 1314 may be the most realistic.

Appendix B, Section 5.6.2, Page 5-11, 1st paragraph: We suggests including particle size distribution and Atterberg limits into the bench-testing work as these results from these analyses will be informative for the design.

Appendix B, Section 5.6.5, Page 5-13, 2nd paragraph: Relying upon Regenesis for protocols for soil mixing is ill advised. They are a product supplier. A qualified geotechnical engineer should specify soil mixing protocols to apply requisite force and qualitative performance monitoring (like particle size reduction and mix uniformity) for assessment. Regenesis will evidently provide concentration (which may likely be in the 2% to 3% per dry weight range), but they should not be entrusted to specify soil mixing protocols unless they are provided by a Regenesis licensed geotechnical engineer.

Appendix B, Section 5.6.6, Page 5-13 to 5-14: Prior to installing the asphalt cap and after compaction testing is complete, it may be advisable to wait a few weeks to a couple months for self-settlement - especially if added liquid is required during soil mixing. ~10 to 12 feet of soil mixing (even following compaction) could result in inches worth of settlement resulting in depressions within the asphalt cap

Appendix B, Section 5.10, Page 5-4: An excavation of this size with staged spoil piles in the Pacific Northwest may need some consideration for precipitation and runoff concerns (tarps, earthen berms, etc.). This is not the same as Section 5.6.7 which appropriately plans for increased runoff following the installation of the cap; this is for earthwork if a rainstorm is encountered.

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Appendix B, Section 5.12.1, Page 5-6, 1st paragraph: Unsaturated zone excavation has the potential to create dust that needs to be managed by the Contractor. OSHA specifications should be used, and a dust monitoring plan is needed. The language here is too flexible and requires quantitative metrics for exposure concerns.

References:

Gonda et al., 2024, Quantitative assessment of poly- and perfluoroalkyl substances (PFASs) in aqueous film forming foam (AFFF)-impacted soils: a comparison of analytical protocols. Anal Bioanal Chem 416, 6879–6892 (2024).

ITRC, September 2023, Aqueous Film-Forming Foam Fact Sheet

Nickerson et al., 2020, Enhanced Extraction of AFFF-Associated PFASs from Source Zone Soils, American Chemical Society.

Comments on the SEPA DNS/Checklist for EFR/IVES Interim Remedial Action

Section B.1.e, Page 7, Vadose Zone Source Treatment: The statement "...PFAS constituents with applicable screening levels are above 1 mg/kg in soil..." ignores the fact that precursors to these compounds can exist and transform into PFAS constituents at concentrations of regulatory concern, and that these precursors cannot be evaluated without sequential basic and acidic extraction analytical methods that do not appear to be considered in this work plan.

Section B.1.e, Page 8, Vadose Zone Source Treatment (via soil stabilization): Ecology should consider whether it is appropriate for a vendor of a specific product to have informed the design where it appears to be biasing the treatment product to a CAC-based product which this vendor provides.

The bench scale test should consider non-CAC products (e.g., FluoroSorb, RemBind, Zeolites) that may be more cost efficient and effective.

Anything less than 1% by dry soil weight may be an improper balance of the mobilization cost versus the certainty of treatment (i.e., no less than 1% by dry soil weight should be evaluated at the bench).

Section B.1.e, Page 9, Backfilling and Compaction: With regards to treated soil and imported structural backfill material placed with 95% compaction, there is no solidifying agent specified in the work plan and no description of how post-mixing consolidation will be considered to prevent future settling.

Section B.1.f, Page 10, Erosion concerns: It is contradictory that the opening statement definitively states no erosion will occur because of clearing, construction or use, yet an erosion and sediment control plan and BMPs are planned to be implemented. This statement should be revised to correct the contradiction.

Section B.3.a, Page 11, Surface water: The statement "no surface water bodies in the vicinity of EFR HQ Source Area" needs more clarification on what is being defined as "vicinity" because the main fork of Issaquah Creek is only 500 feet west of the project area.

Section B.3.b and c, Page 11-12, Ground water: The checklists' discussion of potential impacts to groundwater is completely inadequate. The checklist fails to disclose that the purpose of the PRB is to sequester PFAS in the aquifer itself. It also fails to disclose how this sequestered PFAS will behave in the aquifer over time, including how it could become a continuing source of groundwater contamination for decades to come.

Section B.8.a, Page 17, Land and shoreline use: It is technically incorrect to say "The proposed interim action intends to treat the PFAS concentrations found in vadose zone soil and

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shallow groundwater at the NWN AFFF Training Area and will not affect current land uses on nearby or adjacent properties" (emphasis added).

To clarify, the actions being proposed will not treat the PFAS constituents in the media at the EFR HQ source area. They will only remove and temporally, for an uncertain period of time, trap (**not treat**) the PFAS constituents. It is important to be transparent and factual with the treatment process of this permeable barrier wall. There is a high degree of uncertainty of how long the barrier wall will trap and prevent breakthrough and migration of the PFAS contamination from the source area which is not acknowledged in the in the SEPA DNS/Checklist.