STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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August 25, 2025

Tom Graham
Director EHS, North America
JELD-WEN, Inc.
2645 Silver Crescent Drive
Charlotte, NC 28273 USA

Re: Jeld Wen – Ecology Comments on Uplands EDR Reports

Site Name:	Jeld Wen
Site Address:	300 W Marine View Drive, Everett, WA 98201-1030
Cleanup Site ID:	4402
Facility Site ID:	2757
Agreed Order No.	DE 5095

Dear Tom Graham:

Ecology has received your draft Engineering Design Reports (EDRs) dated July 21, 2025, for the Creosote and Woodlife Areas. Attached are Ecology's comments on these reports.

Please let me know if you have any questions regarding these comments.

As always, Ecology appreciates the ongoing efforts of the Jeld Wen team to clean up the Site.

Sincerely,

Frank P. Winslow, LHG
Toxics Cleanup Program
Headquarters Section

Enclosures

cc: Chris Kramer, SLR
Scott Miller, SLR
Josh Morman, Ecology

Enclosures

Ecology Comments on
Jeld Wen Site - Draft Engineering Design Report – Woodlife Area

Ecology Comments on
Jeld Wen Site - Draft Engineering Design Report – Creosote Area

Ecology Comments on

Jeld Wen Site - Draft Engineering Design Report – Creosote Area

General Comment #1 – Deep Air Sparging

The draft EDR report included air sparging (AS) in the shallow groundwater system only. The report made an argument based on a conclusion that shallow groundwater AS would be sufficient to address the vapor intrusion pathway.

The Final Cleanup Action Plan (CAP) dated August 2023 included both shallow and deep air sparging. While addressing the vapor intrusion pathway is an important element of the AS/Soil Vapor Extraction (SVE) system for this area, other pathways/objectives are also discussed within the CAP including

> "*The remedial action of BIO will be performed in the deep groundwater zone to reduce the presence of and potential for migration of NAPL*." CAP Section 2.3.3.
>
> "*The BIO cleanup action will continue until there is a diminishing return in the BIO's implementation and approval from Ecology. When REL has been achieved and the BIO system is showing diminishing return, the performing PLPs will initiate a study to determine if MNA is applicable to achieve the CUL*…." CAP Section 2.3.4.

Note the CULs for groundwater in the CAP include both naphthalene and CPAHs (see CAP Exhibit 3). Deep AS is needed to promote biodegradation within the deep groundwater zone.

> "*Groundwater REL - Removal of mobile NAPL in deep groundwater (for protection of* shallow groundwater)" (CAP Exhibit 3).
>
> "*Operation of the BIO treatment system in deeper groundwater (nitrate-nutrient-surfactant solution and air injections) will also remove or reduce the presence of NAPL source(s) and address potential migration of these contaminants*." (CAP Section 3.2.1).

These CAP excerpts demonstrate that the objectives of a deep AS system include not only vapor intrusion, but also remediation of NAPL, CPAHs and Naphthalenes in deep groundwater. While achieving RELs and CULs for deep groundwater may be challenging, the proposed cleanup actions are anticipated to enhance conditions within the deep groundwater system including:

- Removal of the more volatile and more mobile fractions and thus providing further protection for both the vapor intrusion pathway and preventing contaminant migration.
- Removal of contaminant mass through physical removal of volatile fractions and enhanced biodegradation.

The objective of this system will be to reduce contamination in the deep groundwater system to the maximum extent practicable, consistent with MTCA requirements. Ecology does not agree with the statement in the EDR "*Not sparging the deeper zone will reduce the potential risk of mobilization of the DNAPL in the deep groundwater*." The volatile fractions will be the most mobile and removing them will reduce overall contaminant mobility. Any case for a mobilization concern for deep AS should have been raised during the FS and CAP phases of the project, not during remedial design.

Ecology requests that the EDR be revised to include the required deep AS wells. The AS wells should cover the extent of groundwater contamination, including the extent of NAPL in the deep groundwater zone, and the extent of naphthalene and CPAHs above CULs within the deep groundwater.

Comment #2 – Section 4.4.3.2 – Inadvertent Discovery Plan

We have been advised that Ecology Toxic Cleanup Program's (TCP's) archaeologist will be performing an archaeological review prior to cleanup. We will let you know when more is known on this subject.

Comment #3 – Section 4.5.1 - Dewatering

Please add a statement in this section that any dewatering discharges will be done in compliance with local and state requirements including any required permits or authorizations.

Comment #4 – Soil Backfill and Surface Restoration

Please state that prior to placement of such fill, the backfill material will be demonstrated to be uncontaminated either through provenance or analytical testing. Ecology highly recommends that "clean fill" materials from urban (non-quarry) sources not be used for this purpose (use of clean quarry fill is highly recommended).

Comment #5 – Section 4.8 - SVE and AS Design Elements

Please add the following subsections to Section 4.8:

4.8.1 SVE System Design Elements

Please list (table or bullet list) and discuss the components of the SVE system. This should include the number of piping runs, lengths, diameters, slot size and filter pack specification (including sizing methods), vacuum blower or pump, and activated carbon effluent treatment vessels.

4.8.2 AS System Design Elements

Please list (table or bullet list) and discuss the components of the AS system. Include the numbers of shallow and deep wells, well screened intervals, slot size and gravel filter pack specification (including sizing methods based on grain size distribution data). Drilling methods should be discussed including procedures to ensure a consistent placement of filter pack gravel.

Comment #6 – Section 4.8 - Depth of SVE system

Ecology approved an excavation approach of four feet of excavation plus two feet of added fill in part due to flooding/groundwater infiltration concerns for the SVE system. SVE system groundwater infiltration was encountered during the AS pilot test and is a significant concern. The draft EDR stated:

> *Saw cuts of the existing surface pavement would be made for each of the SVE sections and the SVE sections would be installed below the existing surface pavement depth (Figure 7). A vapor barrier would be placed over the SVE section cut such that the SVE system induced vacuum would influence soil/soil vapors below the existing surface pavement. The proposed fill and new surface asphalt pavement would be placed over the existing surface pavement as described in Section 4.7 and Appendix A*.

Please add to **Figure 7** the groundwater level range that is expected based on-Site data, including the AS pilot testing and well transducer data. Ecology notes that Attachment 7 from the Uplands PDRI report dated May 30 2025 included hydrographs that ran from May to August 2024. Hopefully, the transducers were left in the monitoring wells and updated hydrographs can be provided since that monitoring data did not likely include the higher water level periods. Ecology cannot provide our concurrence on the SVE system depth until these data and a revised Figure 7 are provided.

Comment #7 – Section 4.8 - Basis of SVE and AS Layout

Ecology requests the following figures to demonstrate the basis of the AS/SVE system layouts:

- Revise **Figure 6** to include the extent of naphthalene and CPAHs in shallow groundwater at concentrations above CULs, and the extent of NAPL in the shallow ground water system (if any has been found).
- Add a new **Figure 7**, Deep Groundwater AS system layout including the extent of naphthalene and CPAHs in deep groundwater at concentrations above CULs, and the extent of NAPL in the deep groundwater system.
- Revised **Figure 5** to show the outline of the area covered by the shallow and deep AS systems and the extent of naphthalene in soil at concentrations above CULs.

Ecology notes that the area covered by the SVE system will need to extend beyond the AS treatment area to demonstrate that all AS air will be captured.

Generally, Ecology expects to see AS and SVE layouts that have sufficient overlap such that no untreated areas remain. Both Figure 5 and Figure 6 currently show untreated areas (based on the estimated radius-of-influences.) Having more overlap of treatment areas appears to be warranted to eliminated untreated areas.

Comment #8 – Section 4.10 - Required Permits

Please modify the EDR as follows:

> All actions carried out by Ecology or Ecology's contractor must be performed in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in RCW 70.105D.090 which allows an exemption from the procedural requirements of **selected** State and local permits, **though the substantive requirements of such permit requirements still apply**.

Comment #9 – Section 4.10 – Required Permits

Please add discussion regarding permitting requirements/authorizations for SVE air discharges and if air pre-treatment will be required. Compliance criteria should be included.

Comment #10 – Section 4.11 – Schedule

Please add discussion that the periods of operation of the AS/SVE system and then MNA monitoring will ultimately be determined by sampling results. The transition from AS/SVE to MNA will be based on Ecology's concurrence that the system is diminishing returns and RELs have been achieved such the continued operations in not warranted. Ecology will make such a determination based on review of the following data:

- SVE discharge analytical data.
- Groundwater monitoring results (including NAPL measurements, groundwater analytical data, and MNA-related data).
- Operational data (showing continued operation and pulsing of the AS and SVE system).

The period of MNA monitoring will be until CULs have been achieved at all groundwater points of compliance or until ceasing of monitoring is approved by Ecology. Ecology anticipates that the MNA monitoring will likely need to have adjustments over time, potentially including locations, analytes, and frequencies.

Comment #11 – Section 4.12.2 – Performance Monitoring

Please clarify that during the excavation work, the lateral extent of the remedial excavation will be expanded should any free product or product blebs be observed in the excavation side slopes.

Comment #12 – Section 4.13 - Reporting

This section indicates that a Cleanup Action Completion Report will be submitted once excavation activities and the surface restoration are completed. Additional reports and plans will be needed as an outcome of the cleanup work. These additional reports and plans will be listed within the Consent Decree for cleanup of the Site and should be mentioned herein. Current Section 4.13 can be revised to be titled "Reporting," with the following subsections added:

4.13.1 – Excavation Cleanup Action Completion Report

4.13.2 – AS/SVE System Installation Report

4.13.3 – AS/SVE System Operations and Maintenance Plan

4.13.4 – Compliance Monitoring Plan

4.13.5 – Monitoring Reports

Ecology notes that the Excavation Cleanup Action Completion Report should include the following elements:

- Plan map showing the excavation boundaries, depths, and previous sampling locations.
- Cross section showing the excavation, groundwater levels (high and low), and remaining contamination.

- Disposal receipts from a permitted disposal facility.
- Discussion of the occurrence (depths and concentrations) of any remaining vadose zone contamination.

The AS/SVE System installation Report should include:

- As-built diagrams and sections for the AS wells, the SVE wells, and the other elements of the construction (e.g. blowers, compressor, and piping).

The AS/SVE System Operations and Maintenance (O&M) Plan will detail operations of the AS/SVE system including performance monitoring requirements such as SVE discharge rate and quality monitoring and activated carbon replacement.

The Performance and Compliance Groundwater Monitoring Plan will detail locations, analytes, and frequencies of groundwater monitoring in the Creosote area to first demonstrate that groundwater RELs have been achieved (and in conjunction with SVE discharge data that diminishing returns have been achieved. And then during MNA until CULs have been achieved. This document can be provided either within the O&M Plan or separately.

Monitoring Reports should include regular reporting of operational and water level measurements and analytical data to Ecology, including both tabulated data and laboratory reports. This should include groundwater monitoring data (water levels and water quality), and SVE and AS operational data. Ecology suggests a quarterly frequency of submittal of monitoring reports.

Ecology Comments on

Jeld Wen Site - Draft Engineering Design Report – Woodlife Area

General Comment #1:

The planned cleanup of the Woodlife Area appears to be a relatively straightforward excavation and offsite disposal cleanup action. For any such project, Ecology's primary interests are:

- Sufficient confirmation sampling data (whether pre- or post-excavation) clearly demonstrate that all contaminated soil has been removed, and where any contamination above cleanup levels remains, the remaining contamination is well defined.
- Documentation of proper soil disposal at a permitted disposal facility (e.g. weight tickets/disposal receipts).
- Documentation of proper treatment and disposal of any dewatering water (including regulatory correspondence demonstrating compliance).

At the Wood life area, some site-specific considerations are as follows:

- Concern of stormwater entering the area from the West Marine View Drive (see EDR Figure 6). Ecology requests conceptual design/plans for mitigating this concern within the 60% design submittal (see also below comment #2).
- Management of traffic to and from the Heidelberg facility to the west.
- Utilities within the excavation area. Please provide a detailed plan map of utilities in this area within the 60% design submittal.

Ecology notes that groundwater compliance monitoring needs will be established within an Ecology-approved Groundwater Compliance Monitoring Plan for the Site as a whole. That document will be referenced within the forthcoming Consent Decree for the Site.

Comment # 2 – Section 4.4.2.2 – Stormwater

This section states:

> *If an unseasonable rain event occurs during the Woodlife Area cleanup, barriers used to control run-on could cause water ponding on West Marine View Drive and this many necessitate road closure for safety. If the Woodlife Area cleanup is*

completed during non-summer months, additional coordination and actions will be necessary to redirect stormwater runoff/run-on in this area.

Ecology does not believe that excavation within summer months and responding reactively would be sufficient to manage risk of stormwater runoff from West Marine View Drive. Although a weather forecast window with no precipitation may significantly reduce risk, mitigation measures need to be in place or ready-to-implement if conditions change or completion of the excavation work is delayed. Hence, Ecology request that the 60% design include the design of measures to prevent stormwater from Marine View Drive entering the site during the excavation work.

Comment # 3 – Section 4.4.3.1 – Health and Safety Plan

Ecology requests that the construction team be advised specifically of the presence of dioxin/furans (DFs) at high concentrations in this area and their highly carcinogenic nature. Prevention of dermal contact or dust inhalation is critical. In addition, rigorous attention to decontamination and management of decontamination fluids is critical in this area. Complacency is always a risk at cleanup sites.

Ecology also notes that the excavation will extend to the edge of West Marine View Drive, so appropriate safety provisions will need to be implemented to ensure safety for workers and passersby.

Comment # 4 – Section 4.4.3.2 – Inadvertent Discovery Plan

We have been advised that Ecology Toxic Cleanup Program's (TCP's) archaeologist will be performing an archaeological review prior to cleanup. We will let you know when more is known on this subject.

Comment # 5 – Section 4.5 – Soil Excavation & Monitoring Wells

Should confirmation soil sampling indicate the need for excavation in an area that has existing monitoring wells, then such wells must be decommissioned by a licensed well driller. If such cases occur, then Ecology will determine the need to replace such monitoring wells.

Comment #6 – Section 4.5.1 – Dewatering

Please add additional detail in this section on the depth to groundwater data in this area, including locations of monitoring wells and minimum and maximum depth to water data. Inclusion of a hydrograph showing seasonal trends and the optimal periods for excavation (lowest groundwater level periods) would be appropriate.

Comment #7 – Section 4.7 – Excavation Confirmation Sampling

Ecology notes that the sufficiency of confirmation soil sampling will be determined by Ecology following receipt and review of the Cleanup Action Report. Should Ecology determine additional data are needed, then additional sampling following cleanup could be required. However, this possibility could potentially be mitigated through real-time communication and data transmittals to Ecology with confirmation soil sampling locations and depths to seek our concurrence on the sufficiency of confirmation soil sampling.

Comment #8 – Section 4.10 - Required Permits

Please modify the EDR as follows:

> All actions carried out by Ecology or Ecology's contractor must be performed in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in RCW 70.105D.090 which allows an exemption from the procedural requirements of **selected** State and local permits, **though the substantive requirements of such permit requirements still apply**.

Comment #9 – Section 4.13 – Cleanup Action Report

Please provide additional details on the components of the Cleanup Action Report, including but not limited to:

- Excavation plan map and sections showing the depth of the excavation, and confirmation soil sampling results documenting clean excavation floor and sidewalls, and remaining contamination, where present.
- Utilities encountered within the excavation and how they were managed.
- Weight ticket/disposal receipts from the permitted disposal facility.
- Discussion of dewatering volumes and periods, copies of regulatory correspondence related to dewatering discharge, and discharge sampling data.
- Discussion of stormwater management during cleanup, including actions to prevent runoff entering the site from West Marine View Drive.
- Discussion of routing of traffic to and from the Heidelberg facility during the excavation work.
- Provenance of "clean fill" used for backfilling the excavation and analytical data if such materials have been sampled. Ecology recommends use of materials only from clean quarries for backfill.