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January 13, 2022

Warren Snyder
Senior Manager, Environmental Engineering
Rayonier Advanced Materials
1301 Riverplace Blvd, Suite 2300
Jacksonville, FL 32207
warren.snyder@rayonieram.com

Re: Response to Rayonier Letter of October 15, 2021, regarding Interim Action Report Volume IV

- **Site Name:** Port Angeles Rayonier Mill Site
- **Site Address:** 700 N Ennis, Port Angeles, Clallam County, WA
- **Facility/Site ID:** 19
- **Cleanup Site ID:** 2270

Dear Warren Snyder:

On October 15, 2021, the Washington State Department of Ecology (Ecology) received Rayonier A.M. Properties' (RAMP) letter responding to Ecology's August 19, 2021, letter (August 19 letter) approving Volumes I, II, and III. Ecology's August 19 letter provided direction for development of the Agency Review Draft of an Interim Action Plan for the Study Area (Volume IV) including the Proposed Interim Action. In your letter you raised concerns that Ecology did not provide rationale for the Proposed Interim Action. As Ecology had several conversations with RAMP on the Proposed Interim Action, we did not provide a detailed rationale in the August 19 letter.

On December 14, 2021, Ecology received a draft Volume IV report. The draft Volume IV report did not include the Proposed Interim Action as directed in Ecology's August 19, 2021 letter. Instead, the draft Volume IV report includes the recommended preferred alternatives of the Volume III report. This letter provides clarification on the cleanup action selection process under authority of the Model Toxics Control Act (MTCA), chapter 70A.305 RCW,[1] Ecology's rationale for the Proposed Interim Action, and next steps for completion of work under Agreed Order No. DE 6815 (agreed order).

[1] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305

MTCA and Selection of Remedy

MTCA rules prescribe how to evaluate and select cleanup actions.[2] The rules also set forth expectations for cleanup actions[3] and for institutional controls.[4] The selected cleanup action must meet the "threshold"[5] and "other"[6] requirements, including using permanent solutions to the maximum extent practicable. The cleanup action also must not rely primarily on institutional controls when it is technically possible to implement a more permanent action for all or a portion of the site.[7]

Only one of the evaluated alternatives can satisfy the requirement to use permanent solutions to the maximum extent practicable. Ecology uses the disproportionate cost analysis (DCA) to determine which alternative uses permanent solutions to the maximum extent practicable.[8] This involves comparing the alternatives against the evaluation criteria:[9]

- Protectiveness
- Permanence
- Cost
- Effectiveness over the long term
- Management of short-term risks
- Technical and administrative implementability
- Consideration of public concerns

Volume III evaluated the alternatives presented against these criteria, calculated benefit-to-cost ratio, and recommended those alternatives with the highest benefit-to-cost ratio as the preferred alternatives.

The comparison of benefits and costs may be quantitative (i.e. a benefit-to-cost ratio), but will often be qualitative and require the use of best professional judgement. Specifically, Ecology has the discretion to favor or disfavor qualitative benefits and use that information in selecting a cleanup action.[10]

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[2] WAC 173-340-360
[3] WAC 173-340-370
[4] WAC 173-340-440
[5] WAC 173-340-360(2)(a)
[6] WAC 173-340-360(2)(b)
[7] WAC 173-340-440(6)
[8] WAC 173-340-360(3)(b), (e)
[9] WAC 173-340-360(3)(f)
[10] WAC 173-340-360(3)(e)(ii)(C)

When determining which cleanup action alternative "uses permanent solutions to the maximum extent practicable,"[11] MTCA requires Ecology to select the most permanent alternative whose incremental cost is not disproportionate to the incremental benefit it would achieve compared to the lower cost alternatives.[12] Thus, the alternative with the highest benefit-to-cost ratio is not necessarily the same as the alternative that is "permanent to the maximum extent practicable."

In addition, the MTCA rules and the Sediment Management Standards (SMS) require that the cleanup action shall not rely primarily on institutional controls and monitoring where it is technically possible to implement a more permanent cleanup action for all or a portion of the Site.[13]

The agreed order required RAMP to produce a feasibility study (Volume III) which develops and evaluates a range of alternatives for interim remedial actions for the Study Area. RAMP could include a recommendation for the selection of an interim action alternative for Ecology's consideration. The Volume III report indeed does this. As stated in Ecology's August 19 letter, Ecology agrees there is sufficient information for Ecology to select the Proposed Interim Action. **However, our approval of Volume III does not constitute concurrence with the conclusions reached regarding the recommended preferred alternatives of Volume III.**

Rationale for Proposed Interim Action

The following is provided to supplement Ecology's August 19 letter.

Soil

Ecology selects Alternative SL-3 as the Proposed Interim Action for soil. Alternative SL-3 is permanent to the maximum extent practicable, and does not rely primarily on institutional controls for large portions of the property.

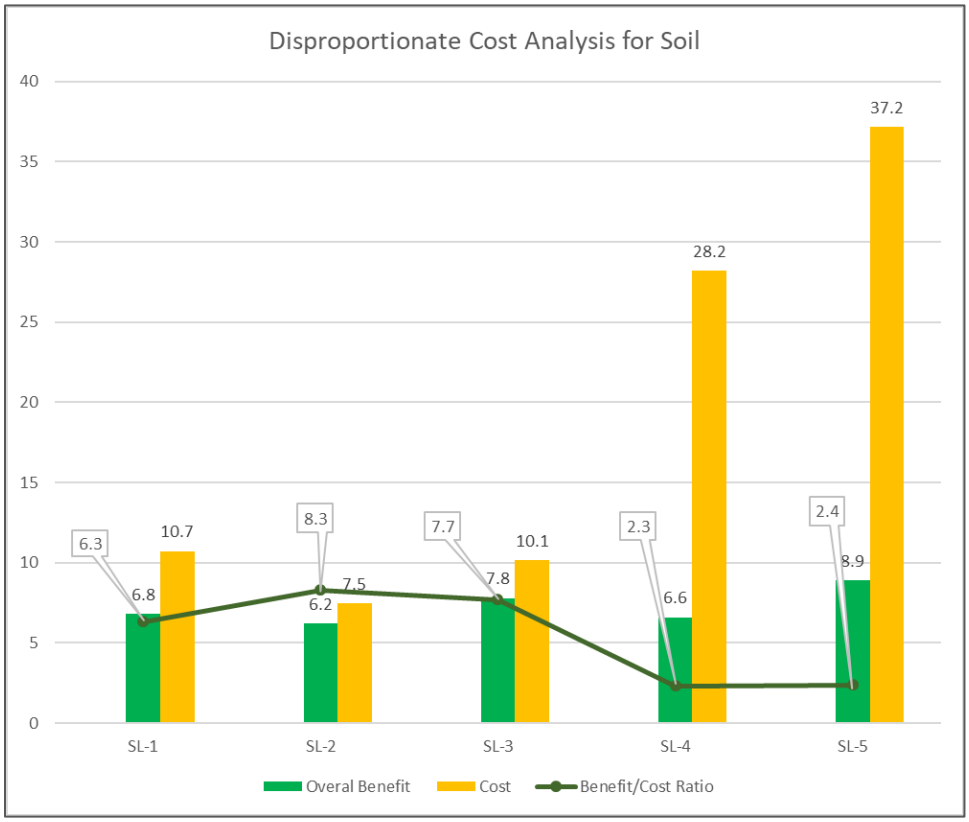
As mentioned above, under a DCA, the comparison of benefits and costs may be quantitative, but will often be qualitative and require the use of best professional judgement[14]. Ecology reviewed the Volume III DCA, evaluated the incremental change in benefit versus cost, and applied best professional judgement to determine which alternative is permanent to the maximum extent practicable.

[11] WAC 173-340-360(3)(b)
[12] WAC 173-340-360(e)
[13] WAC 173-340-440(6) and WAC 173-204-570(3)(h)
[14] WAC 173-340-360(e)(ii)(C)

Review Overall Benefit and Cost

Volume III presented the Overall Benefit and Cost, and the benefit-to-cost ratio in Figure 1.

Figure 1



- Alternative SL-5 scores the highest on Overall Benefit, but is the most costly alternative. The benefit-to-cost ratio is low at 2.4.

- Alternative SL-2, the recommended preferred alternative of Volume III, scores the lowest on Overall Benefit, but is the least costly alternative. The benefit-to-cost ratio is high at 8.3.

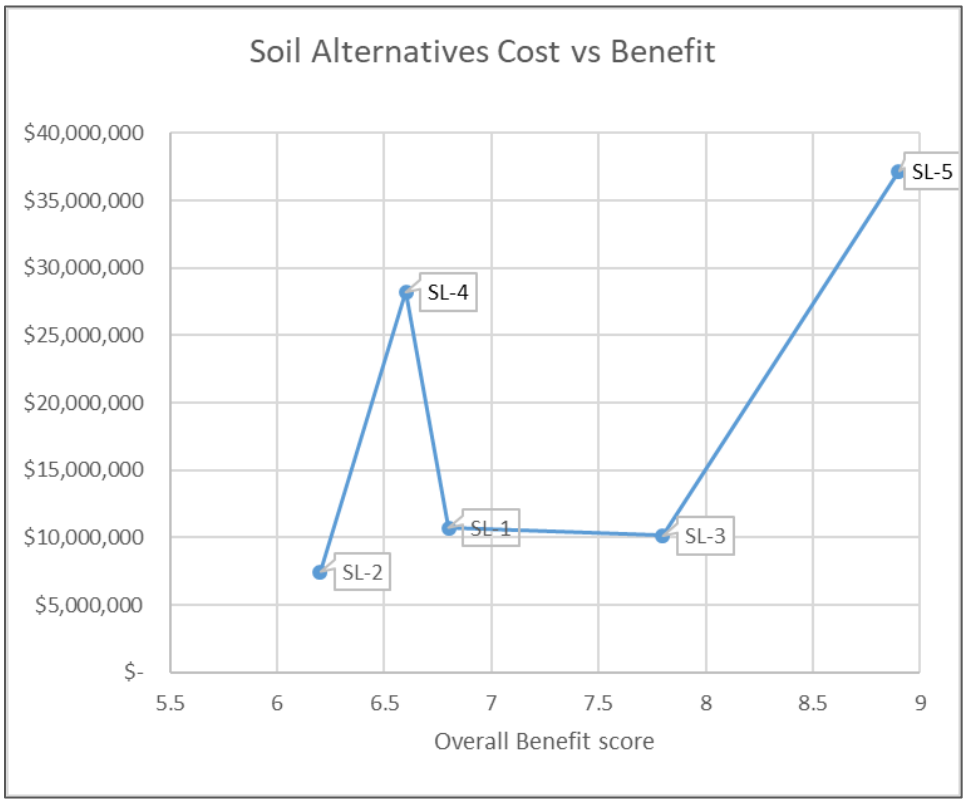
- Alternative SL-3 scores second highest on Overall Benefit, and is the second least costly alternative. The benefit-to-cost ratio is also high at 7.7.

While the benefit-to-cost ratio for Alternative SL-3 is slightly less than Alternative SL-2, it provides a higher overall benefit with a cost that is not disproportionate to the cost of Alternative SL-2. Alternative SL-3 provides the best overall benefit while being one of the least costly alternatives. **Alternative SL-3 would achieve more benefit than Alternative SL-2 from a quantitative and qualitative standpoint without being disproportionately more costly. As such, it is the alternative that "uses permanent solutions to the maximum extent practicable."**

Incremental Change in Overall Benefit versus Incremental Change in Cost

To look at the incremental change in Overall Benefit versus incremental change in Cost, Ecology plotted the Overall Benefit versus Cost (Figure 2).

Figure 2



The inflection point in the curve is at Alternative SL-3. This is the point where the incremental change in Cost of the alternatives grows faster than the incremental change in Overall Benefit. The incremental benefit gained between Alternatives SL-5 and SL-3 is 1.1 (i.e., 8.9-7.8) at a cost of $27M which is disproportionate. The incremental benefit gained between Alternatives SL-3 and SL-2 is 1.6 (i.e., 7.8-6.2) at a cost of $2.7M. This cost is not disproportionate. **Thus Alternative SL-3 is permanent to the maximum extent practicable**.

MTCA requires that the cleanup action shall not rely primarily on institutional controls and monitoring where it is technically possible to implement a more permanent cleanup action for all or a portion of the site.[15] Institutional controls include physical measures like fences, use restrictions, and educational programs like signs and postings. Engineered controls include containment or treatment systems designed and constructed to prevent or limit the movement of, or exposure to, hazardous substances.

[15] WAC 173-340-440(6)

Institutional controls are less protective than engineered controls as they are not very effective or reliable at preventing exposure to hazardous substances in the long term. People do ignore signs, cut through fences, and set up camps on vacant land. In comparison, an engineered cap is far more reliable and likely to endure, especially over the long term, as a means of preventing people from being exposed to hazardous substances at levels MTCA deems unsafe for unrestricted exposure scenarios. This is also why Ecology concludes, from a qualitative standpoint, that Alternative SL-3 would achieve substantially greater benefit over SL-2 than the purely quantitative analysis might indicate.

It is technically possible (i.e., capable of being designed, constructed and implemented regardless of cost) to use an engineering control (containment) for the contaminated soil exceeding unrestricted use cleanup levels (CULs). After considering the alternatives presented in Volume III, it is clear that it is technically possible to implement a more permanent cleanup action than Alternative SL-2, which relies primarily on institutional controls for portions of the upland study area cleanup. **Alternative SL-3 consolidates and contains all contaminated soil above the CULs, and does not rely primarily on institutional controls.**

Groundwater

Ecology selects Alternative G-1 as the Proposed Interim Action for groundwater. Alternative G-1 is permanent to the maximum extent practicable. Volume III identified Alternative G-1 as the recommended preferred alternative. Ecology agrees with the Volume III recommendation, and has determined that Alternative G-1 is permanent to the maximum extent practicable.

Sediment

Ecology selects Alternative S-2 with the modification of dredging the dock footprint as the Proposed Interim Action for sediment. Alternative S-2 is permanent to the maximum extent practicable. Volume III recommends Alternative S-2 as the preferred alternative. **Ecology agrees with the Volume III recommendation with the modification of dredging the dock footprint.**

Contaminated sediment in the dock footprint shall be dredged, assuming a 2-foot cut (as described in Alternative S-3). The berth areas shall be filled with clean fill to match the post-dredge elevations in the dock footprint to achieve a bathymetry less prone to the accumulation of fine particulates and potential contaminants. The enhanced natural recovery (ENR) layer shall extend across the filled berth areas and dock footprint.

Sediments under the dock are not well characterized in the Marine Data Summary Report (Volume II) due to the limited number of samples. Volume II notes that concentrations of risk drivers and contaminants of concern in surface sediment were generally highest near the dock.

There is a concentration gradient with the highest concentrations being generally closer to the mill dock and decreasing with distance from the dock[16]. Also, there are no toxicity results for sediments under the dock.

Untreated wastewater was discharged from outfalls under and near the dock for decades. Also, the dock consists of approximately 4000 creosote pilings that have been and continue to be an on-going source of polycyclic aromatic hydrocarbons (PAHs). These concentrated sources in one area support the conclusion that the sediments under the dock are likely contaminated to at least the same level as sediment immediately adjacent to the dock, and the contamination likely poses a bioaccumulation and toxicity threat.

In 2019, RAMP shared a proposed Technical Assistance – Field Conditions Survey for the Dock, Jetty, and Shoreline Project. The purpose was to sample soil and sediment conditions to support the engineering design for the removal of the dock and jetty, and re-contouring of the shoreline. Ecology understands that soil sampling took place in August 2019, and sediment sampling took place in November and December 2019. The sediment sampling was to include six cores under the dock. RAMP has not provided the results of this field survey. **Please provide these results to Ecology**.

Based on the high concentrations of contaminants adjacent to and emanating from the dock, the fact that creosote pilings and outfalls beneath the dock are a known source of PAH contamination, and no recent data to indicate otherwise, Ecology concludes the sediments under the dock are contaminated, and likely at higher concentrations compared to surrounding sediments.

The large dock structure has protected the underlying sediments from erosional forces. Once the dock is removed, there is a potential that the underlying contaminated sediments will erode and spread contamination to other areas of the harbor.

ENR is an effective remedy for areas where contaminant concentrations are sufficiently low that the addition and mixing of clean substrate with the existing shallow sediment is adequate to meet the cleanup levels within a reasonable restoration timeframe. However, sediment concentrations in the dock footprint may be too high for ENR to be successful.

Dredging the contaminated sediments in the dock footprint is more protective as it reduces the potential for contaminated sediments to spread to other areas of the harbor, and ensures the cleanup levels in the sediment cleanup unit are achieved in a reasonable restoration timeframe. **Therefore, Ecology is modifying Alternative S-2 to include dredging the dock footprint.**

[16] Volume II, Section 2.3.1.2

Next Steps

Ecology supports the removal of the dock and jetty, and shoreline reconfiguration. As we have discussed for several years now, because of the potential for erosion of contaminated sediments, the dock and jetty cannot be removed without fully remediating contaminated sediments and shoreline soils as part of the same project.

Ecology is working with all permitting agencies. The permitting agencies require assurance that the necessary remedial actions for contaminated sediments are known, approved, and ready to be implemented. To provide that assurance, Ecology must approve, under the MTCA process, an Interim Action Plan for the Study Area and engineering design for sediment and shoreline soil remediation. As we have discussed, the sediment remediation can be phased first.

The purpose of the Interim Action Plan for the Study Area (Volume IV) is to document the Proposed Interim Action. Ecology provided direction for the Proposed Interim Action in its August 19 letter, and further detail and rationale in this letter. The December 14, 2021, draft Volume IV report did not document the Proposed Interim Actions for soil and sediment as directed.

Therefore, RAMP is not in compliance with the agreed order. RAMP shall revise the draft Volume IV report to include the Proposed Interim Actions. **Ecology is granting a deadline for submittal of the revised Volume IV report of 60 calendar days from receipt of this letter.**

If you have any questions, I may be reached at (360) 407-6257.

Sincerely,

Marian L. Abbett

Marian L. Abbett, P.E.
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MLA/tam

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Ecology Site File