



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **Draft Model Remedies for Cleanup of Former Orchard Properties in Central and Eastern Washington *Responsiveness Summary***

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***Ecology's response to public comments***

**Comment Period: May 7, 2021 through June 7, 2021**

For the

**Toxics Cleanup Program**

Washington State Department of Ecology  
Union Gap, Washington

July 2021, Publication 21-09-005

## Publication Information

This document is available on the Department of Ecology's website at:

<https://apps.ecology.wa.gov/publications/summarypages/2109005.html>

### Related Information

Former Orchard Property Soil Arsenic and Lead Levels. Ecology requires soil sampling for properties in areas that were occupied by orchards prior to 1950 and are being converted to another use.

For an interactive map, visit: [Dirt Alert Map](#)<sup>1</sup>

*Please note: Use any common web browser, except Internet Explorer, for maps to display.*

### Toxics Cleanup Program

Central Region Office  
1250 W. Alder Street  
Union Gap, WA 98903-0009  
Phone: 509-454-7838

**Website**<sup>2</sup>: [Washington State Department of Ecology](#)

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<sup>1</sup> <https://apps.ecology.wa.gov/dirtalert/>

<sup>2</sup> [www.ecology.wa.gov/contact](http://www.ecology.wa.gov/contact)

# Department of Ecology's Regional Offices

## Map of Counties Served



Region	Counties served	Mailing Address	Phone
<b>Southwest</b>	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
<b>Northwest</b>	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
<b>Central</b>	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
<b>Eastern</b>	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
<b>Headquarters</b>	Across Washington	PO Box 46700 Olympia, WA 98504	360-407-6000

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## Summary

Pesticide practices used on historical orchards caused widespread soil contamination in Central and Eastern Washington. Lead arsenate, broadly and legally applied, was used to control the codling moth, which caused apples and cherries to rot. Lead and arsenic, two toxic chemicals, were the main components of this pesticide. Its use occurred over six decades, from the late 1800s until approximately 1950, when it was replaced by DDT. Lead arsenate was used more and more frequently over time as its effectiveness decreased. Lead and arsenic do not degrade over time, and remain in the soil to this day. This document is designed to outline sampling and cleanup methods consistent with Ecology's regulations.

A public comment period was held from May 7, 2021 through June 7, 2021 for the review of the Draft Model Remedies for Cleanup of Former Orchard Properties in Central and Eastern Washington: Sampling and Cleaning up Arsenic- and Lead-Contaminated Soils. The following comments were received during the comment period. These comments helped inform updates to the final version dated July 2021. The final document is available on the Department of Ecology's website at: <https://apps.ecology.wa.gov/publications/SummaryPages/2109006.html>. Comments have been presented verbatim, other than minor editing to fit the format of this Responsiveness Summary. Ecology's responses are after each comment and are in *italics*.

# Comments Received with Ecology's Responses

## Comment from Brian Patterson:

I am commenting on the document "Draft Model Remedies for Cleanup of Former Orchard Properties in Central and Eastern Washington". I want to express my support for the document as written, including all wording, technical approaches, and requirements. This is a program that has been a long time coming, resulting in thousands of children in Washington State growing up on land contaminated with lead and arsenic at levels likely to affect their brain development, who never should have been subjected to these conditions.

Given that the development of the draft model remedy went through an extended process in 2020 through the Working Group, which included a broad range of stakeholders, it was developed openly and fairly. As such, it is my assumption that there will be no substantive changes to the draft model remedy prior to finalization. If this is not the case, it should be presented again for public comment.

Once finalized, the model remedy will only be protective of human health if it is utilized. There are at least three essential components to assuring that it is used:

1. The Department of Ecology continues to advocate for its use, to both the public and to the government agencies (e.g. cities and counties) that grant permits for development.
2. Local government agencies that grant permits for development integrate requirements to comply with the model remedy into their permitting processes.
3. The public has a mechanism for communicating with the Department of Ecology to disclose projects that should be complying with the model remedy but might not be.

To ensure that all three of these components are utilized, I would request that the Department of Ecology specifically add to its website a notification page where members of the public can go to view projects that have gone, or are currently going, through the model remedy process. This web page should include the ability for anyone to submit to the Department of Ecology information about a potential or ongoing project on old orchard land that does not currently appear on the Department's list of such projects.

Thank you for your efforts on this extremely important program.

***Ecology's Response to Brian Patterson:***

*Thank you for your comments. The final model remedy will have minor edits, but no substantial changes will be made. The Department of Ecology is working with affected local governments to convey our expectations that sampling and cleanup, if necessary, is required for historical orchard areas. Cleanup is expected to occur prior to occupancy. Our official SEPA comment reflecting these requirements began in mid-April. Ecology also plans to conduct a robust education and outreach campaign for the public.*

*Already, several blog posts have been published and will continue throughout the year. These posts have resulted in positive media attention and more public awareness.*

*Ecology recently asked local governments to participate in a process that will result in example model codes that could be incorporated into existing rules. Similar codes in multiple cities and counties will provide clarity to homebuilders and developers, and Ecology will advocate for their adoption and use.*

*Ecology plans to update our website so community members can contact Ecology about specific properties. Ecology also plans to update our online maps to reflect planned and completed cleanups.*



**Comment from Norm Peck:**

Overall I believe you have developed an excellent Model Remedy for evaluation and remediation of soil contaminated by past use of lead arsenate as a codling moth control in apple and pear orchards.

I would like to suggest inclusion of suggestions to engage in at least some cursory information gathering about orchard history if it is available, and possibly some limited background information on how PbAs was used. For example the two most common application methods were broadcast spraying and tree-specific sprinkler head application. These two methods result in unique and different distributions of contamination within the orchard areas. The suggestion to identify, if possible, the mixing area and treating it as a separate decision unit is a very good one. All of the above support the suggestion to explore history of use/layout if possible.

In the XRF testing section, I suggest including a couple of notes or cautions. First, in the use of first generation XRF technology (aka "The Gold Brick") in evaluation of XRF at the Tacoma Smelter Plume Child Use Areas, it was found that where lead (Pb) concentrations in soil exceeded 50-100 mg/kg, XRF arsenic (As) detections were biased low compared to laboratory test results of the same samples. So if Pb concentrations are elevated, lab sampling verification of As results should be considered. Second, particularly in light of the MTCA soil standard being based on the soil fraction 2mm in diameter or less and the potential low bias of results if gravel is present in the in-situ soil sampling location, I suggest ex-situ XRF testing of sieved, bagged (e.g. sealing freezer bags) of at least three locations on the bag of soil. It is my recollection that a higher correlation with lab results was obtained using this method vs. in-situ XRF soil readings. Sieving the soil samples also is more in conformance with MTCA sampling standards than in-situ, un-sieved XRF results. While this method does require a little more time, the increased speed of XRF analysis minimizes the time requirement vs. the higher expense of an on-site wet chemistry lab or time delays associated with conventional sample labeling, chain of custody, shipping, etc. for off-site lab analysis.

These comments are not intended to detract from the overall high quality of the proposed Model Remedy, but to add to the already well done document.

If reviewing the spreadsheets comparing XRF results with lab results from TSP child use areas included in the comparison study, I can provide them on request.

***Ecology's Response to Norm Peck:***

*Thank you for the comments. We will include a statement with a requirement that when using XRF technology, detection limits shall be at (or below) the required cleanup levels.*

**Comment from Mike Ehlebracht:**

Overall the Model Remedies document seems to lay out a practical and useful approach for addressing surface soil contamination associated with historical orchard operations. I would like to encourage Ecology to consider the use of multi-increment sampling (MIS) when evaluating compliance for the excavation, mixing, and consolidation model remedies. While I completely support the use of XRF for initial and compliance characterization, MIS should also be included as a viable approach rather than relying on discrete sampling. EPA and other state agencies have shown that using MIS reduces data variability and enhances sample representativeness and reliability compared to discrete sampling. In addition, MIS is a more practical approach for characterizing large areas of surface soil impacted by non-volatile constituents such as metals.

Thanks.

***Ecology's Response to Mike Ehlebracht:***

*Thank you for the comment. Ecology will include a statement allowing other sampling methods as approved by Ecology (e.g. Multi-Incremental Sampling).*