

Rayonier Mill Off-Property Soil Dioxin Study

The Washington State Department of Ecology (Ecology) created this document to answer questions about the Rayonier Mill Off-Property Soil Dioxin Study. Ecology worked with the Washington State Department of Health (DOH) and the Clallam County Department of Health and Human Services to answer questions about potential public health concerns.

Background

Ecology will study whether dioxins from past stack emissions were deposited in surface soils downwind of and nearby the former Rayonier Mill in Port Angeles. Past soil testing in the community near the mill detected low levels of dioxins. However, it is currently unknown if those levels are associated with the former mill or other sources.

This study will focus on areas in Port Angeles that are downwind of the former Rayonier Mill site where dioxins might have been deposited in the past. This includes areas where Ecology expects to find the highest soil dioxin levels related to the mill. Ecology will try to determine:

- The magnitude of dioxin soil contamination in the areas identified as “downwind” of the Rayonier site.
- The former Rayonier Mill’s contribution to measure dioxin contamination, compared to other possible sources.

The results from this study cannot be used to determine whether dioxins might pose a health risk to the Port Angeles community.

Section I. The Soil Sampling Process

Q: How did Ecology choose the soil sampling study area?

A: Ecology looked at existing information, including:

- Past soil dioxin sampling results.
- Odor complaint studies.
- Past research about airborne dioxin contamination.

NEED MORE INFORMATION?

Rayonier Mill Off-Property Soil Dioxin Study Web site:

http://www.ecy.wa.gov/programs/tcp/sites/rayonierOffProp/rayonierOffPr_hp.htm

For questions about this study, contact:

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Special accommodations:

If you need this publication in an alternative format, call 360-407-6300. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

- Local wind patterns.
- Rayonier Mill air dispersion and deposition modeling. The model used weather data, local geography, and other information to predict where dioxins from the mill might have landed.

Ecology also considered areas near other potential sources, and undisturbed soils such as forests. Studies have found that undisturbed soils better represent higher level contaminant concentrations because development and other forms of soil disturbance dilute or remove contaminants.

Q: How many properties will be sampled and how will they be chosen?

A: This study has enough funding to collect and analyze 100 soil samples. Ecology is selecting the sample locations using these considerations:

- Prior studies and air modeling have shown that contaminant levels from air deposition tend to be higher **nearer to the source**. Sampling will be denser close to the suspected source – Rayonier. The study area is divided into seven zones with different sampling densities.
- **Undisturbed areas** give a better picture of maximum dioxin levels. Contaminants tend to be diluted or removed in areas that have been developed or disturbed in other ways.
- Certain areas need to be excluded if the soil has been eroded, protected from deposition (steep slopes or ravines), or highly landscaped.

Each zone within the study area has a grid overlaid (see Figure 1 on page 3). One sample location will be selected from each grid cell.

Q: How can I participate in this study?

A: Ecology's contractor, Ecology & Environment (E&E), will be managing the soil sampling work. They will be working directly with property owners. Those interested in having soil sampling done on their property can contact Ecology Project Manager Connie Groven at 360-407-6254 or Hannah Aoyagi, Ecology Public Involvement at 360-407-6790. However, there is no guarantee that your property will be sampled. Each sampling location must meet specific criteria that help determine which soils are most likely to have remaining dioxins from the Rayonier Mill.

Q: How does soil sampling work?

A: The soil sampling team will arrive at the time you schedule with them. They will dig five small holes, four inches deep, in one area of your property. They will take some soil from each hole, then fill it back in. The soil from each hole will be combined into one sample for analysis. This will not cause any damage to your property. The whole process should take about one hour.

Q: When will I get my results?

A: Soil sampling and analysis will take several months. You will receive a letter and attached results from Ecology by early 2009. Although Ecology does not expect this to happen, you will be notified immediately if your soil results show there might be an immediate health risk.

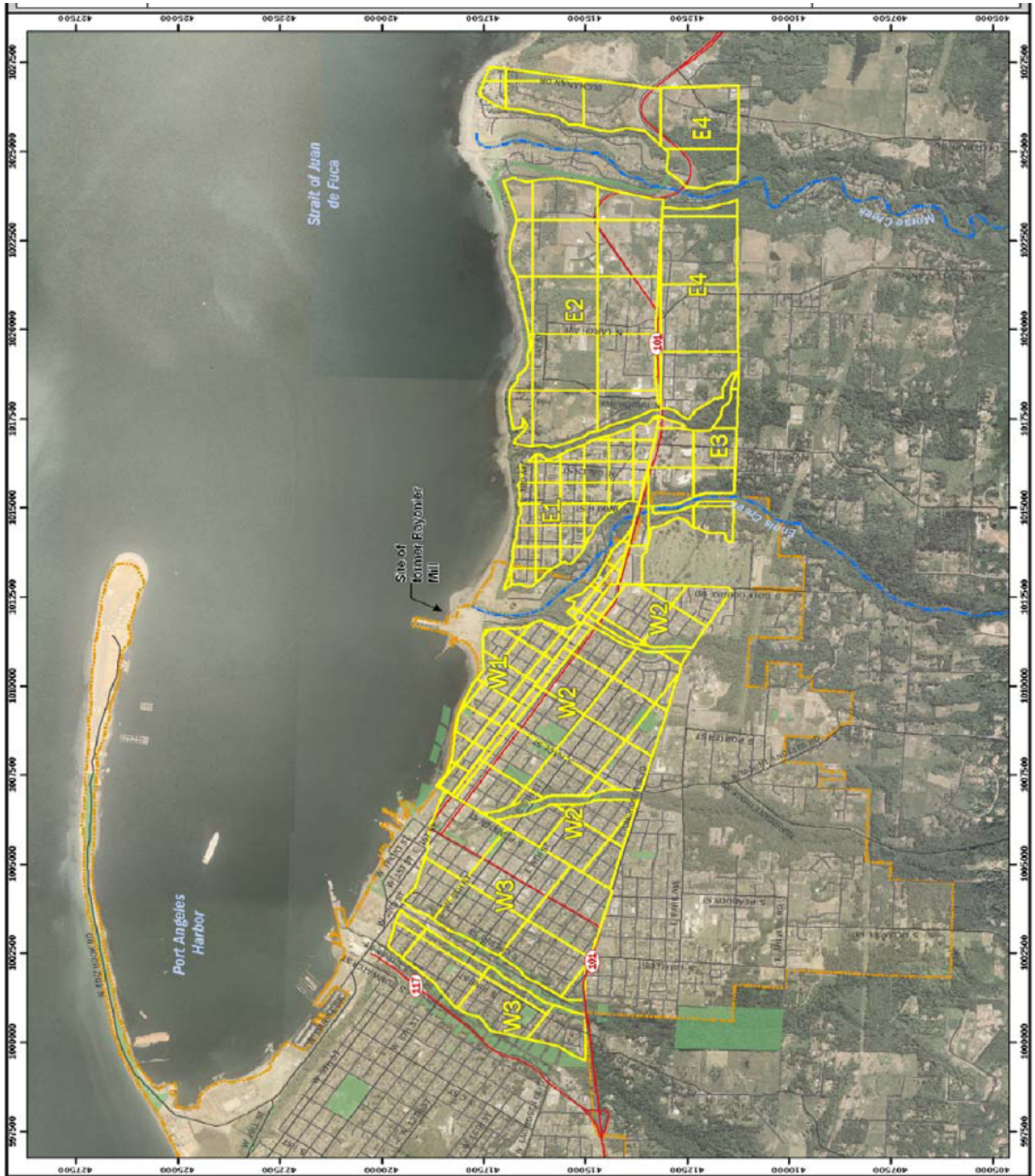


Figure 1. Sample grid spacing, Rayonier Mill Off-Property Soil Dioxin Study, Port Angeles, WA

Q: Do I have to have my soil tested?

A: The soil sampling is voluntary and you have the right to refuse access to your property.

Q: How can I test for dioxins if my property is not chosen for this study?

A: You can contact Ecology for guidance on how to sample your property for soil dioxins. Please contact Project Manager Connie Groven at 360-407-6254. Keep in mind that:

- Laboratory analysis for dioxins is very expensive – over \$1,000 per sample; and
- Even without sampling data, concerned property owners can take Healthy Actions (see page 6) as a precaution, to reduce potential exposure to dioxins in soil.

Section II. Soil Sampling Results and What They Mean

Q: How will Ecology use the results from the study?

A: Ecology will look at the pattern and magnitude of soil dioxin to see if there are areas where soil dioxin levels are elevated and may pose a threat to human health or the environment. Ecology will also try to determine the contribution of dioxin from the Rayonier Mill, compared to other possible sources. Further studies may be needed to delineate (outline) the extent of contamination if Ecology identifies areas of concern. One way to identify areas of concern is to compare soil results with the state cleanup level for dioxin. Under the Model Toxics Control Act (MTCA WAC 173-340), the soil cleanup level for dioxin is 11.1 parts per trillion (ppt).

Q: What if I have dioxins in my soil above the state cleanup level?

A: Soil dioxin concentrations can vary widely, even within a small area. Therefore, the single sample collected in this study will not be enough to understand the contamination on your property. The sample will also not be enough to understand the possible health risk. Ecology will work with you to take the appropriate next steps. If you are concerned about your family's health and safety, you can reduce their exposure to potentially contaminated soils by following the Healthy Actions listed on page 6.

Q: Will I be required to clean up my property?

A: No. The purpose of this study is to determine the local pattern of dioxin contamination in soil. The purpose is not to determine if individual properties need cleanup. The single sample from your property is not enough to determine if your property needs to be cleaned up.

Q: Will I have to disclose soil contamination if I sell my property?

A: Real estate law requires disclosure of known contamination on Form 17 (Chapter 64 RCW 64.06.020). As a buyer or seller, you may want to consult with a real estate attorney on disclosure.

Q: Will this study provide information about health risks from soil dioxins?

A: The results from this study cannot be used to determine whether dioxins might pose a health risk to the Port Angeles community. Some of the soil samples for this study will be collected from locations where people are unlikely to contact soil. Further, when samples are collected in areas where soil contact might occur, the number of samples will be too small to determine whether dioxins might pose a health risk. Health risks to the Port Angeles community will be studied in the future if elevated soil dioxin levels are found.

Section III. Dioxin Information

Q: What are dioxins?

A: Dioxins are a family of chemicals that have similar structures and biological effects. They are unintentional by-products of both human activities and natural processes. They do not break down easily in the environment, and as a result, are found everywhere. Most people are exposed to low background levels of dioxins.

Q: Where do dioxins come from?

A: Dioxins can be formed during industrial processes, such as burning saltwater-soaked wood for fuel (done at the Rayonier Mill in the past) and certain types of chemical manufacturing. Dioxins can also be formed during combustion (burning) and waste incineration. This includes home burn barrels*, fireplaces, and wood stoves.

**Please contact the Olympic Region Clean Air Agency for more information about the health effects of home burning, and how to reduce your risk. Phone: 360.586.1044, Web site: www.orca.org.*

Q: How might I be exposed to dioxins?

A: Most people are exposed to low background levels of dioxins when they consume food or milk. People can also be exposed to dioxins when they breathe dioxin-contaminated air or have skin contact with dioxin-contaminated soils or other materials. However, inhalation and skin contact are minor pathways compared to eating food or milk. *State cleanup standards for dioxins are usually based on exposure through incidental ingestion dioxin-contaminated soils.*

Q: How can dioxins affect my health?

A: Exposure to small amounts of dioxins (like those found near the Rayonier Mill in the past) can possibly increase the risk of certain cancers in humans. However, that risk could be as small as zero. Some non-cancer health effects are associated with dioxin exposure, such as immune system and reproductive system problems. Those effects have been found in animals and humans exposed to levels many times higher than background dioxin levels. The health effects associated with low level dioxin exposure are still being studied.

Q: What have past studies shown about the levels of dioxins in Port Angeles soils?

A: Several studies have tested dioxin levels in the soils around Port Angeles, outside of the Rayonier property. In addition to the two studies described below, there are data from two local landfill investigations in 1998, the Graving Dock Excavation Sampling in 2003, and the Rayonier Mill uplands Remedial Investigation. More information is available in the Soil Sampling Plan.

The Expanded Site Investigation in 1998 tested 20 samples for dioxin contamination. A 2004 Public Health Assessment, by the Agency for Toxic Substances and Disease Registry (ATSDR), considered these results. ATSDR concluded **none** of the contaminants detected in off-site soil would be expected to cause adverse health effects in potentially exposed residents. The method for calculating dioxin cleanup levels has recently changed. Using the current method, seven of those samples are above the Model Toxics Control Act (MTCA) cleanup level for dioxins of 11.1 parts per trillion (ppt)*, ranging from 11.7 ppt to 32.6 ppt. A 2008 study in the Gales Addition housing development found only one sample slightly above the MTCA cleanup level at 12.0 ppt.

* *The cleanup level of 11.1 ppt is based on incidental soil ingestion. It is measured to account for mixtures of dioxins, which can have different levels of toxicity.*

Q: What level of risk does this pose?

A: The levels of dioxins found in past soil studies pose a very low to low health risk.

Q: Did Ecology warn residents about dioxins in Port Angeles soils?

A: Ecology does not have enough data to confirm that a public health hazard exists. A Public Health Assessment completed in 2004 by ATSDR found that none of the contaminants detected in soils outside the Rayonier property were expected to cause adverse health effects in potentially exposed residents. Ecology recognizes that gaps exist in our knowledge of soil conditions in Port Angeles. This study will provide more information about levels of soil dioxins in Port Angeles.

Q: How can I keep my family safe from possible soil pollution?

A: Although Ecology has found low levels of dioxins in the soils in the past, there are several Healthy Actions residents can take as a precaution until more is known. These Healthy Actions can help protect against possible exposure to both dioxins and other types of soil contamination.

Healthy Actions include:**1. Using plenty of soap and water**

- Wash your hands and face before eating and after working or playing in soil. Use a scrub brush to clean dirt under your nails.

- Scrub fruits and vegetables before you eat them, to remove any dirt.
 - Wash children's toys, bedding and pacifiers often.
- 2. Mopping, Dusting, and Vacuuming**
- Remove shoes before entering the house. Place a "wipe-off" mat outside entrances.
 - Use a damp cloth for dusting and mopping at least once a week.
 - Vacuum several times a week. Use a bag designed to filter "allergens" or a HEPA (High Efficiency Particulate Arrestor) filter. Change the bag monthly.
- 3. Maintaining Your Grounds** - Cover bare patches of soil with a ground cover like grass, gravel, wood chips, or mulch. Use garden boxes filled with clean soil for growing vegetables.
- 4. Keeping Pets Clean** - Pets can track dirt inside your home. Wipe off their fur and paws before they come indoors. Brush and bathe pets regularly.

Q: Are the vegetables in my garden safe?

A: Vegetables can potentially be contaminated by airborne particles (dust) landing on plant surfaces or directly from contact with contaminated soil. Food testing and research studies have shown that plants can only take up a small fraction of the dioxins present. Washing and peeling garden vegetables can reduce soil exposure.