

# Appendix A

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## **RESPONSIVENESS SUMMARY**

**Rayonier Mill Off-Property Soil Dioxin Study  
June 30—July 30, 2008 Public Comment Period**

### **Draft Soil Sampling Plan**

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## Soil Dioxin Study Information

**Location:** Port Angeles, Clallam County

**Project Manager:** Connie Groven

**Public Involvement Coordinator:** Hannah Aoyagi

The Washington State Department of Ecology (Ecology) is planning a study of dioxin and furan pollution in soils near and downwind of the Rayonier Mill cleanup site. Past soil sampling has shown that dioxin levels in this area may exceed state cleanup levels. This study will look at:

- Where dioxin pollution is most likely to be found.
- The nature and extent of dioxin soil pollution near the Rayonier site.
- Evaluating the chemical patterns of dioxins to determine where they came from.
- Whether any dioxin pollution can be attributed to the Rayonier site.

## Background

Port Angeles is located in Clallam County, on the Strait of Juan de Fuca, in the northern part of the Olympic Peninsula (see page 4 for a map). The Port Angeles Rayonier Mill Off-Property Soil Dioxin Study will generally focus on an area of over 4 square miles surrounding the Rayonier site, to a maximum distance of about 3 miles in the dominant downwind direction (east/southeast). Previous sampling has shown that some soils in Port Angeles have dioxins above the state cleanup level of 11.1 parts per trillion (ppt).

**Dioxins** and **furans** are toxic chemicals that can cause cancer and may cause reproductive and developmental effects. They are stored in fatty tissues and accumulate as they move up the marine food chain. They come from natural and manmade sources, such as:

- Forest fires.
- Burning seawater-soaked wood.
- Garbage burning.
- Industrial incinerators.
- Chlorine bleaching.
- Other industrial processes.

Possible dioxin sources in Port Angeles include local industries such as Rayonier, medical waste incineration, natural fires, wood-burning stoves, burn barrels, and garbage incineration.

## Soil Sampling Activities

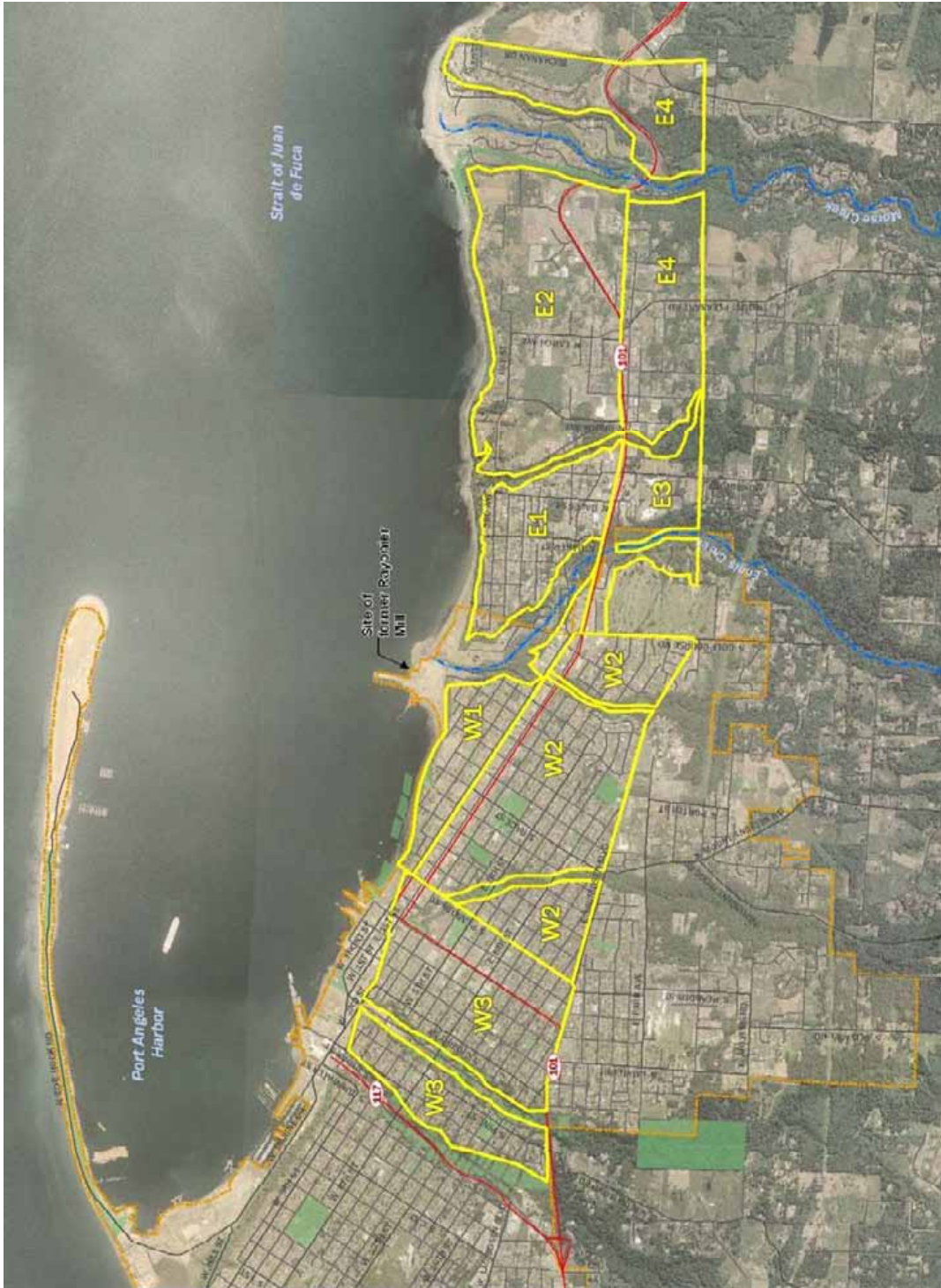
Ecology has been working with a contractor to plan the soil dioxin sampling process. Local property owners may be contacted for permission to access their property for sampling. Samples will take several months to analyze in a laboratory. Data evaluations will include analysis of the chemical patterns of dioxins to determine possible sources of contamination. The final report will be ready in the spring of 2009.

**Next Steps**

Next steps depend on the soil sampling results and analysis of chemical patterns. The dioxin levels will determine Ecology's response and the patterns may determine liability. Dioxin levels below state cleanup standards (under 11.1 parts per million) will not require action or further studies. Slightly higher levels may be addressed by public education about protective measures such as hand-washing and keeping soil out of the home. Ecology will need to work with the Washington State Department of Health, the local health department, and the Port Angeles community to address higher levels. Further studies may be needed in these two cases. If Ecology identifies Rayonier or another source as contributing to soil dioxins, they will be held liable for further studies and cleanup.

**Public Comment Period**

Ecology has considered all public comments in finalizing the Soil Sampling Plan for this study. This Responsiveness Summary lists all public comments and Ecology responses. Further questions can be directed to Site Manager Connie Groven, (360) 407-6254, [cgro461@ecy.wa.gov](mailto:cgro461@ecy.wa.gov).



Rayonier Mill Off-Property Soil Dioxin Study map, from the Soil Sampling Plan (study zones outlined in yellow)

## Comments Received and Ecology Responses

The following comments were received during the June 30 – July 30, 2008 public comment period for the Rayonier Mill Off-Property Soil Dioxin Study. These comments will be added to the site file and made publicly available.

### **Ecology Response to General Comments**

Several issues were raised by more than one commenter. This section of the Responsiveness Summary addresses these common concerns.

#### **General Response 1: Sampling Depth**

Several comments were submitted stating that the proposed sampling depth of 0-4 inches (10 cm) was too deep, and recommending a shallower depth for sample collection.

The depth profile for dioxins/furans in the soil column is associated with individual locations. Some variation in those depth profiles across locations is to be expected as a result of the history of soil-disturbing activities (both anthropogenic and non-anthropogenic) at various locations, as well as the physical and chemical characteristics of the soils. Soil profiles for dioxins/furans may also reflect the cumulative amount of deposition that has occurred, which is a function of location, land cover, and other variables.

In this study, considering design objectives and available resources, a decision was made to sample only a single depth interval, thereby providing information on a larger number of sampling locations. The choice of a uniform depth interval for sampling is made without site-specific information on the distribution of depth profiles over the study area. For an air deposition pathway, surface soils are most relevant; the remaining issue is the detailed definition of a uniform depth for sampling surface soils.

Selection of a sampling depth interval involves a balancing of two factors: detection/source identification and quantification of dioxin/furan concentrations in soils. If dioxins/furans occur mostly or only in the upper few inches of the soil column, including soils below those near-surface depths in a sample will dilute the sample and produce lower reported dioxin/furan concentrations. Modest degrees of sample dilution will not affect detection of dioxins/furans. If depth profiles are somewhat inverted (i.e., higher concentrations occurring at deeper depths in the soil column), not sampling deep enough may also produce lower reported concentrations. If near-surface soils include little or no dioxins/furans (e.g., clean fill soils placed on top of those former surface soils where deposition occurred), more than sample dilution may result – detectability may be excluded. Absent detectability, a sample will not contribute toward source identification. Given these considerations, a sampling depth of 0-4 inches was proposed that favored detection (especially recognizing that most samples would be collected at developed rather than forested/undeveloped properties) while accepting a possible small degree of dilution in reported dioxin/furan concentrations.































































































