

## Quick Guidance for Arsenic and Lead Soil Sampling and Cleanup

Soils on your property may be contaminated with arsenic and lead from the former Asarco smelter in Tacoma. The **Tacoma Smelter Plume Model Remedies Guidance** (guidance) explains how to sample and clean up soils. This fact sheet gives an overview of the guidance and when to use it.

### What are Model Remedies?

These Model Remedies are cleanup methods that the Washington Department of Ecology (Ecology) approved for Tacoma Smelter Plume contamination only. They may not be used if there are other types of contamination on the property. Ecology has tested these methods and found them to be effective.

### Who should use this guidance?

**Property owners or developers planning on grading their property should follow the guidance.**

First, check where your project is within the Tacoma Smelter Plume. See page 4 for a map or visit <https://fortress.wa.gov/ecy/smeltersearch/>. The map shows estimated arsenic levels in parts per million (ppm).

Actual levels can vary greatly from property to property. Soil sampling is the only way to know if your property is contaminated. Ecology recommends you sample your soil for arsenic and lead if your property is in an area where the arsenic is estimated to be over 20 ppm.

You should also consider...

- **Development history:** Undeveloped land tends to have higher levels of arsenic and lead than developed land.
- **Future use:** There is greater risk to human health if the area will be used by children or people often in contact with soil.
- **Cleanup approval:** If a local permit office, buyer, or lender requires Ecology's written approval of your cleanup, enter the Voluntary Cleanup Program (VCP). The VCP is now free for projects with only Tacoma Smelter Plume contamination. To learn more, contact Eva Barber (upper right).

### About the Tacoma Smelter Plume

Asarco's former copper smelter in north Tacoma emitted arsenic, lead, and other heavy metals. These pollutants were carried by the wind and settled on surface soils, creating the Tacoma Smelter Plume (page 4).

### More Information

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#### Tacoma Smelter Plume website

<http://www.ecy.wa.gov/toxics/tacoma-smelter.html>

#### Model Remedies Guidance

<https://fortress.wa.gov/ecy/gsp/DocViewer.ashx?did=5364>

#### Cleanup database

<https://fortress.wa.gov/ecy/areispublic/>

**To request ADA accommodation,** including materials in a format for the visually impaired, call Ecology at 360-407-6300. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

**Facility Site ID #: 89267963**

### Soil Sampling Basics

You don't need to hire a professional to sample soil. Soil sampling does not require special tools or expertise. The Model Remedies Guidance explains the sampling process in more detail.

- **Equipment:** trowel or small shovel; mixing bowl; glass jars or plastic zip bags to hold the samples; wash bucket, soap, scrub brush, and rinse water.
- **Lab analysis:** Ecology has a list of state-accredited labs at <http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp>. Use EPA methods 6010, 6020, or 6200 (arsenic and lead), or 7060 (arsenic), or 7421 (lead).
- **Lab cost:** \$30-60 per sample for arsenic and lead.

### Planning to Sample

**Number of samples:** Use the table below to find how many samples to take. First, look at the **future use** of the land. Take more samples for home sites, play areas, or commercial buildings than for open spaces. Check the map to see if you are sampling an area where arsenic is estimated to be over 100 parts per million (ppm).

**Sample depths:** You must sample more than just the 0-6 inch layer of soil. At every fourth location, take a sample from 6-12 inches. In some cases, the guidance advises taking deeper samples.

**Forest duff:** This is the layer of decomposing leaves and needles on the soil surface. It can contain high levels of arsenic and lead. Be sure to sample forest duff before disposal, composting, or reuse.



Minimum number of sample locations per area sampled

| Sampling area | Residential, parks, commercial |                              | Forest and open land       |                              |
|---------------|--------------------------------|------------------------------|----------------------------|------------------------------|
|               | Samples needed                 |                              | Samples needed             |                              |
| Acres         | Estimated arsenic >100 ppm     | Estimated arsenic 20-100 ppm | Estimated arsenic >100 ppm | Estimated arsenic 20-100 ppm |
| 0.25*         | 10                             | 8                            | 8                          | 8                            |
| 1             | 20                             | 16                           | 16                         | 12                           |
| 5             | 40                             | 32                           | 30                         | 24                           |
| 10            | 60                             | 48                           | 40                         | 32                           |
| 20            | 80                             | 64                           | 50                         | 40                           |
| 100           | 120                            | 90                           | 70                         | 60                           |
| >100          | 120 + 1 per 5 acres            | 90 + 1 per 5 acres           | 70 + 1 per 10 acres        | 60 + 1 per 10 acres          |

0.25 acres ~ 11,000 square feet

## What do the sampling results mean?

Soils are over state cleanup levels if:

- Average arsenic >20 ppm or
  - Single sample of arsenic >40 ppm
- OR -
- Average lead >250 ppm or
  - Single sample of lead >500 ppm

See the guidance for next steps.

*Average refers to the arithmetic average.*

## Choosing a Remedy

The guidance describes four cleanup options:

- **Excavation and removal** permanently removes arsenic and lead and is effective at any level of contamination.
- **Mixing or tilling** can only be used as a model remedy if your soils have less than 40 ppm arsenic.
- **Capping in place.** You can cap soil in place with soil or pavement.
- **Consolidation and capping.** You can also dig up soil and move it into one spot for capping.

The depth and type of cap depend on the arsenic levels. Caps also need regular inspection and maintenance.

**Note:** Ecology does not recommend caps for residential properties.

## What else is in the guidance?

The guidance also explains more about how to:

- Sample soils for arsenic and lead.
- Plan for cleanup.
- Sample soil stockpiles for landfill disposal or reuse on the property.
- Check imported fill or topsoil.
- Sample to show that your soil is remediated.

Use the guidance worksheets to:

- Keep a record of your work.
- Help estimate cleanup costs.

Direct link: <https://fortress.wa.gov/ecy/publications/publications/1209086other.pdf>

### Health Information

**Arsenic:** Scientists have linked long-term exposure to arsenic to many health problems. They include heart disease, diabetes, and cancer of the bladder, lung, skin, kidney, liver, and prostate.

**Lead:** In children, lead can cause behavior problems like hyperactivity, developmental delays, and reduced growth. In adults, lead can increase blood pressure, affect memory, and add to other health problems.

### Protect Yourself With Healthy Actions

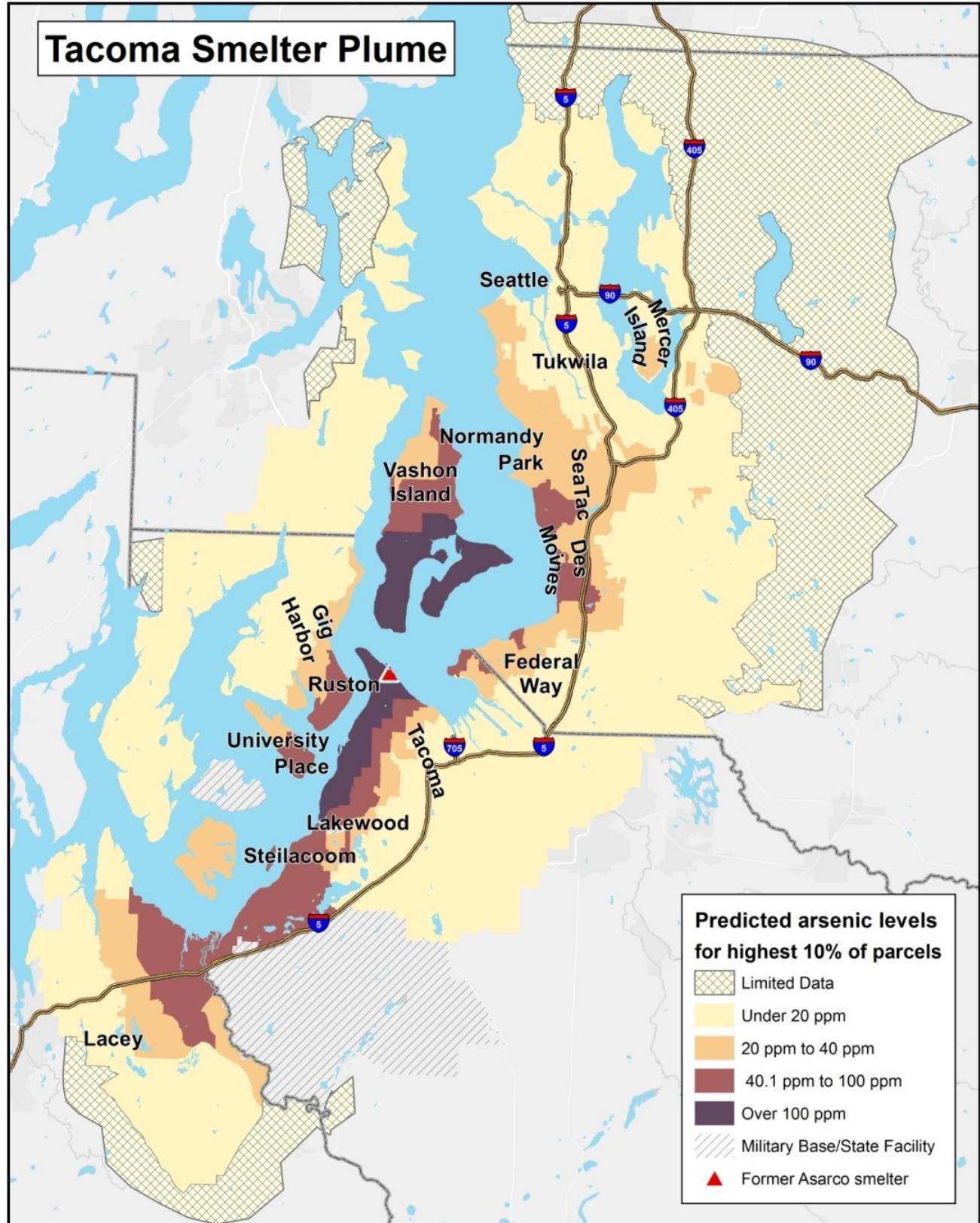
When working or playing outside, wear gloves and wash your hands to lower exposure to soil.

Wear a mask to avoid breathing in dust and water down dry areas.

Wash work clothes separately from other laundry and avoid bringing soil into the home.







With 90% certainty, at least 1 in 10 parcels will have arsenic in soil at or above levels shown. Predictions are based on distance and direction from the former Asarco smelter, and on sampling data from forested and other soils undisturbed by development. Actual arsenic levels may vary greatly from parcel to parcel. Arsenic levels are shown in parts per million (ppm). This map is also available at: <https://fortress.wa.gov/ecy/smeltersearch/>.