



DEPARTMENT OF
ECOLOGY
State of Washington

Tacoma Smelter Plume Annual Report

Fiscal Year 2019

December 2019

Publication 19-09-082

Publication and Contact Information

This document is available on the Department of Ecology's website at:
<https://fortress.wa.gov/ecy/publications/summarypages/1909082.html>

For more information contact:

Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-6000

Washington State Department of Ecology – www.ecology.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Union Gap 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit <https://ecology.wa.gov/accessibility>. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TTY at 877-833-6341.

**Tacoma Smelter Plume
Annual Report**

Accomplishments in 2019

Toxics Cleanup Program

Washington State Department of Ecology

Olympia, Washington

This page is purposely left blank

Table of Contents

	<u>Page</u>
List of Figures and Tables.....	3
Acknowledgements.....	4
Executive Summary	6
Purpose of the report.....	6
Contents and timeline covered in this report	6
Asarco Settlement funds assist in cleanup and outreach	6
Additional funding will be needed to complete some cleanup projects	6
Asarco Settlement	8
Asarco’s legacy in Washington	8
The 2009 Asarco bankruptcy settlement.....	8
Tacoma Smelter Plume	10
At a glance	10
Understanding patterns of contamination helps to prioritize the work.....	10
Early health risk management focused on community outreach and safety concerns.....	10
Multi year plan for managing the Tacoma Smelter Plume	11
Future planning	12
Yard Sampling and Cleanup Program	13
Work is underway to sample and replace soil in yards in Tacoma and Vashon-Maury Island.....	13
Soil Sampling complete	13
Vashon Work Complete.....	13
Cleanup Sequence	14
Cleanup Progress	14
Ruston/North Tacoma Superfund area.....	16
After Superfund cleanup, remaining contamination still poses a risk	16
EPA Five Year Review: Local Health Department assists in efforts	16
Dirt Alert Map: Soil sampling and cleanup information at your finger-tips	17
Education and Outreach Programs.....	18
Dirt Alert.....	18
Priorities for Outreach.....	19

Partnership with the local health departments20

Home soil testing20

Social marketing campaign and behavior change.....21

Soil Safety Program23

 Reducing the service area of the Soil Safety Program.....23

 Soil Safety Program continues work in areas where children play24

Technical Assistance Program.....25

 Encouraging soil cleanup during development.....25

 Free technical advice for planned and completed cleanup projects.....25

 Summer Lane development—integrating cleanup into development.....26

Interim Action Plan.....27

 Phase One.....27

 Phase Two.....27

 Real Estate Transactions27

 Addressing soil contamination during development.....27

 Working with other agencies28

Conclusion29

 Services to residents within the plume area29

 2019 Accomplishments and Highlights29

 Site Information30

List of Figures and Tables

	<u>Page</u>
Figure 1: Asarco 50th Anniversary.....	8
Figure 2: Tacoma Smelter smokestack.....	8
Figure 3: Tacoma Smelter Plume	8
Figure 4: Former Asarco Smelter with its 571 foot smokestack	10
Figure 5: Breakdown of \$94.6 million (M) for the projected cost of managing the risk form the Tacoma Smelter Plume*	11
Figure 6: Tacoma Smelter Plume spending.....	12
Figure 7: Soil sampling and soil replacement progress	13
Figure 8: Soil replacement sequence inside the study area.....	14
Figure 9: Soil replacement sequence outside the study area.....	14
Figure 10: Bar graph of our soil replacement since it started in 2013.....	15
Figure 11: Map of EPA study area	16
Figure 12: Dirt Alert Map.....	17
Figure 13: Dirt Alert statistics from October 1, 2013 to September 30, 2019.....	18
Figure 14: A front yard with kids playing on replaced soil	20
Figure 15: Van used by Tacoma-Peirce County Health Department for outreach and education.....	21
Figure 16: Number of residents receiving home soil testing between 2011 and 2019.....	21
Figure 17: Covering up bare patches of soil	22
Figure 18: Take off your shoes at the door	22
Figure 19: Soil Safety Program Service Area.....	23
Figure 20: Sandy Shores Community Park undergoing soil replacement	24
Figure 21: Technical Assistance on cleanup in 2018-2019	25
Figure 22: The developer built play areas on cleaned land	26
Figure 23: The developer built residential homes on cleaned land	26

Acknowledgements

The author of this report thanks the following people for the contribution to the report.

Lead author and editor

- Pallavi Mukerjee

Contributors

- Marian Abbett
- Eva Barber
- Crescent Calimpong
- Sheila Coughlan
- Amy Hargrove

This page is purposely left blank.

Executive Summary

Purpose of the report

The purpose of this report is to describe how the Department of Ecology (Ecology) is using the Asarco settlement to manage the risk from the Tacoma Smelter Plume. It provides an update on the cleanup progress and efforts to manage human health risks.

Contents and timeline covered in this report

The report covers the following:

- The plan for managing the Asarco Settlement
- Cleanup strategies and priorities
- Accomplishments and 2019 performance measures

Most of the report data are from October 1, 2018 through September 30, 2019.

Asarco Settlement funds assist in cleanup and outreach

Our work funded by the Asarco settlement provides important services to residents that live within the plume. With these funds we are able to:

- Provide outreach to increase awareness and promote healthy behaviors to reduce contact with contaminated soil.
- Provide free soil sampling and soil replacement to existing residential yards in areas of highest contamination through the yard program.
- Sample and replace contaminated soil in areas where children play.
- Assist landowners in cleaning up contamination during property development.

Additional funding will be needed to complete some cleanup projects

We received \$94.6 million through Asarco bankruptcy. We have managed this money resourcefully over the last nine years.

As of fiscal year 2019, we have spent \$51,504,750. We anticipate the Settlement Account funds will be depleted by Fiscal Year 2024 or 2025. We estimate that 200 yards will still need cleanup. With an additional \$14 million in other funds, we will be able to complete the remaining soil replacement and continue outreach in the impacted communities.

This page is purposely left blank.

Asarco Settlement

Asarco's legacy in Washington

Contamination from smelters and mines

The American Smelting and Refining Company (Asarco) was founded in 1899. Asarco operated two smelters and four mines in Washington, leaving a legacy of contamination.

The **Tacoma Smelter** operated from 1890 to 1986, and the Town of Ruston grew up around it. Air emissions from the smelter contaminated over 1,000 square miles of soil in the Puget Sound region, covering King, Pierce and Thurston counties.

This area is called the Tacoma Smelter Plume (plume).



Figure 1: Asarco 50th Anniversary

The 2009 Asarco bankruptcy settlement

Washington becomes part of the nation's largest environmental settlement in history

In 2005, Asarco declared bankruptcy, largely due to environmental liabilities from its nearly 100 cleanup sites across the country. The State of Washington joined the federal government and other states in a suit against Asarco that spanned four years.

In November 2009, Asarco paid out a \$1.79 billion settlement. The settlement covered past and future cleanup costs, as well as interest earned over the four years. Washington's share, deposited into the Cleanup Settlement Account in December of 2009, was \$188.5 million—nearly 90 cents for every dollar claimed.

Tacoma Smelter Plume communities benefit from \$94.6 million for replacing soil and reducing risk

Asarco settled for \$94.6 million for future costs of managing the risks of the Tacoma Smelter Plume. It covers soil replacement for play areas and residential yards, ongoing education and outreach, and technical assistance for those voluntarily cleaning up their own properties. For planned settlement spending (see figure 6).

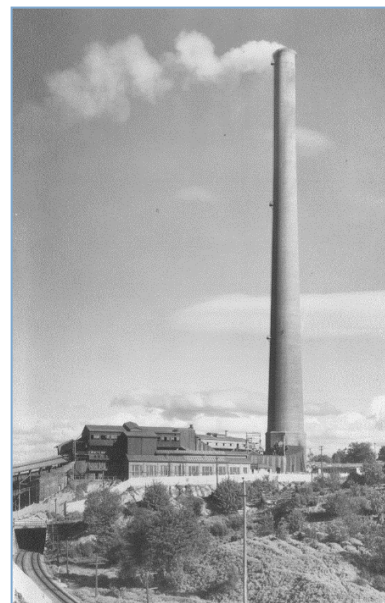


Figure 2: Tacoma Smelter smokestack

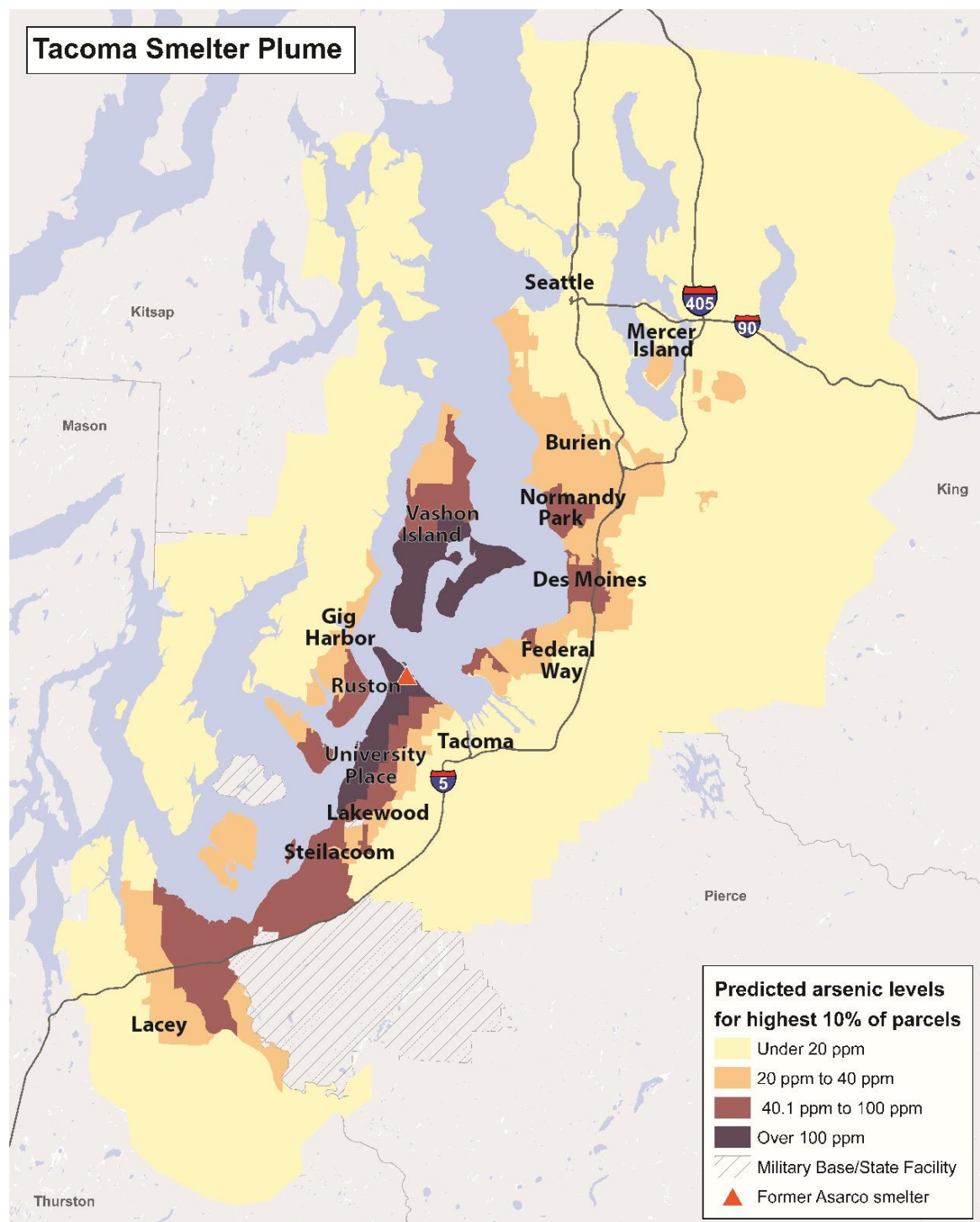


Figure 3: Map of Tacoma Smelter Plume

This is a map of predicted arsenic levels in the soil. There is 90 percent certainty, at least 1 in 10 parcels will have arsenic in soil at or above levels shown. Actual arsenic levels may vary greatly from parcel to parcel. Arsenic levels are shown in parts per million (PPM). The state cleanup level for arsenic is 20 ppm. The Action Level for soil replacement is 100 ppm. For more information on yard program action levels see our FAQ at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1309086>

Tacoma Smelter Plume

At a glance

- **Total settlement:** \$94.6 million
- **Counties:** Pierce, King, Thurston
- **Total size:** Over 1,000 square miles
- **Cleanup focus:** Surface soils

In 1890, a lead smelter began operating on the border of north Tacoma and Ruston. Asarco purchased it in 1905 and converted it to a copper smelter in 1912. Its smokestack emissions dispersed arsenic, lead, and other heavy metals across a 1,000 square mile area—Tacoma Smelter Plume.

Arsenic and lead pose a potential, long-term health risk. Within the plume, people may be exposed by accidentally ingesting or inhaling contaminated soil. Children are at highest risk because they put dirty hands and toys in their mouths, and because their bodies are still growing and developing.



Figure 4: Former Asarco Smelter with its 571 foot smokestack

Understanding patterns of contamination helps to prioritize the work

The Tacoma smelter used high- arsenic ores. Its 571 foot smokestack (see figure 4) was believed to be the tallest in the world when it was built. These factors, along with wind patterns and topography, created the broad pattern of contamination (see figure 3).

Early health risk management focused on community outreach and safety concerns

Starting in 2000, Ecology funded the health departments in King and Pierce counties for work related to the Tacoma Smelter Plume. The funding covered education and outreach programs, as well as soil sampling to better understand the plume extent.

The main goals of outreach were to raise awareness and promote “healthy behaviors”— behaviors that reduce soil exposure, such as hand washing and taking shoes off at the door. The health departments used surveys, focus groups, and other feedback to develop a set of outreach materials and strategies for reaching people.

In 2005, the Area-Wide Soil Contamination law (Chapter 70.140RCW) led Ecology to develop the Soil Safety program. At first, the program provided free soil sampling and replacement for play areas at schools and childcares. In 2010, using funding from the Asarco settlement, we expanded it to include parks, camps, and multi-family housing play areas.

Multi year plan for managing the Tacoma Smelter Plume

Using lessons learned from earlier outreach and play area safety actions, Ecology developed a plan in 2012 that focuses work in four main areas:

- **Yard Program**-Sample and replace soil from existing residential yards in areas of highest contamination.
- **Soil Safety Program**-Sample and replace soil in child play areas at schools, childcares, parks and camps.
- **Outreach and Education**-Raise awareness about contamination and healthy behaviors through partnerships with health departments in King and Pierce counties.
- **Technical Assistance**-Work with local governments and developers to encourage voluntary cleanup. Assist developers with soil cleanup.

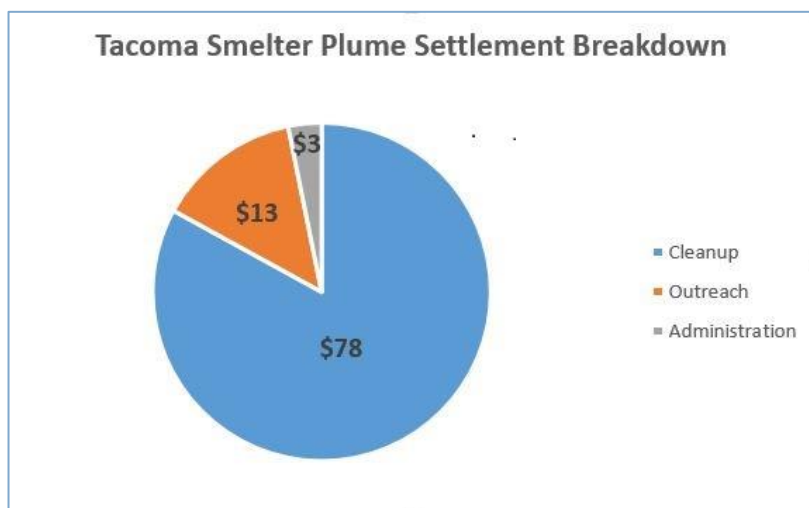


Figure 5: Breakdown of \$94.6 million (M) for the projected cost of managing the risk form the Tacoma Smelter Plume*

**(We have consolidated soil safety and yard program under cleanup in Figure 5)*

Future planning

As of fiscal year 2019, we have spent \$51,504,750. We anticipate the Settlement Account funds will be depleted by Fiscal Year 2024 or 2025. By then, we estimate that 200 of the nearly 1,200 yards qualifying for soil replacement will still need cleanup.

With an additional \$14 million in other funds, we will be able to complete the remaining soil replacement and continue outreach in the impacted communities. If the additional funds are provided in smaller increments (e.g., \$3 million (M) per biennium), then we will spread the work out over the next several biennia (Fiscal Years 2025 through 2033). We would reduce staffing and the number of yards completed each fiscal year to meet reduced funding. Sources of other funds will be determined by the legislature. (For planned spending over the biennia see figure 6).

Many residential yards have arsenic and lead above cleanup levels but below the actions levels that qualify for soil replacement. On-going education and outreach will be necessary for the foreseeable future as many residential yards will not have the soil replaced and contamination will always remain in the Tacoma Smelter Plume

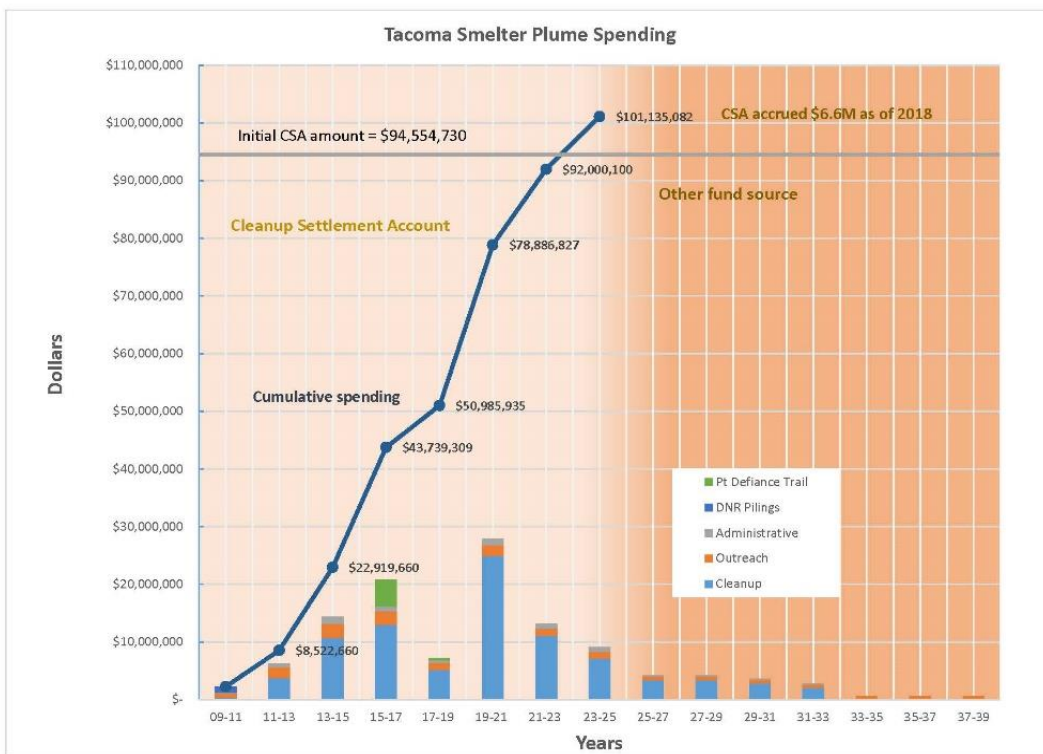


Figure 6: Tacoma Smelter Plume spending

Yard Sampling and Cleanup Program

Work is underway to sample and replace soil in yards in Tacoma and Vashon-Maury Island

The Residential Yard Sampling and Cleanup Program provides free soil sampling for residential yards in the service areas. Ecology is offering free cleanup, also known as soil replacement, for portions of yards with levels over 100 parts per million (ppm) for arsenic or 500 ppm for lead.

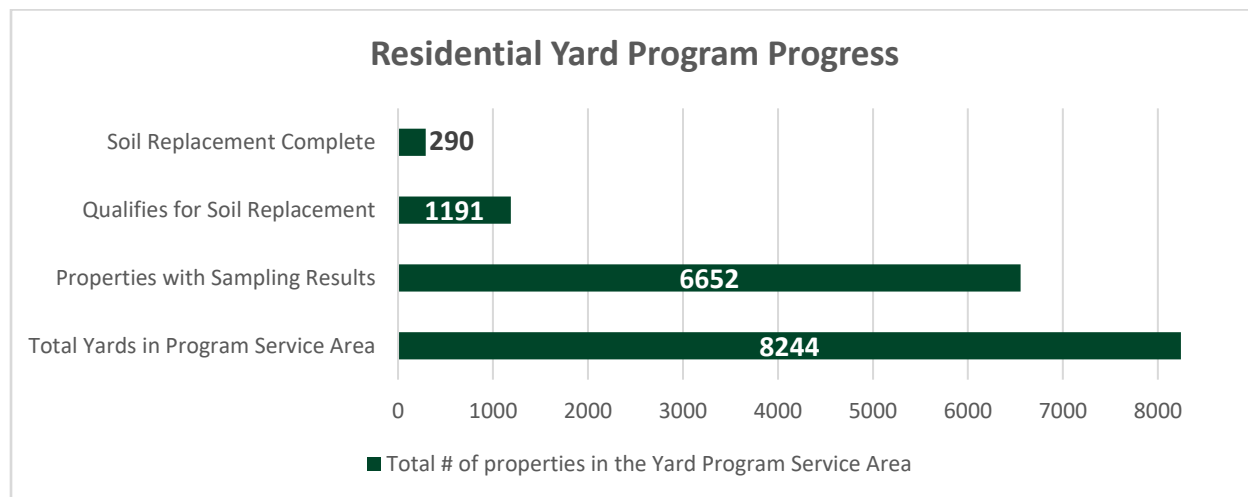


Figure 7: Soil sampling and soil replacement progress

Soil Sampling complete

The Yard Program provides free soil sampling and cleanup for residential yards in the most contaminated areas of the Tacoma Smelter Plume. Our program is completely voluntary. Property owners opt-in for soil sampling and soil replacement. We’ve offered sampling to all properties in our Yard Program service area and sampled all properties that granted us permission to do so.

Through sampling, we found 1,191 properties that qualify for soil replacement. To date, we removed and replaced soil on 290 properties. We will continue to offer soil sampling to new homeowners, as we focus our program’s efforts on soil replacement.

Vashon Work Complete

In 2019, we completed soil replacement work on 14 properties on Vashon-Maury Island. For now, we are complete with our soil sampling and soil replacement work on the island. We will continue to offer soil sampling and soil replacement to new homeowners. This sampling may result in future soil replacement work on Vashon-Maury Island.

Cleanup Sequence

Figure 8 shows Ecology’s soil replacement sequence inside the EPA study area (see figure 11 and page 17). The soil replacement sequence is based on the percentage of properties with the highest remaining soil contamination and properties that had no EPA soil replacement action. There are five areas within the study area. Each area includes three to five different letter groups.

Figure 9 shows Ecology’s soil replacement sequence outside the study area. The soil replacement sequence is based on the percentage of properties that qualify with arsenic over 100 ppm, geographic proximity, and total number of properties in a group. There are seven areas outside the study area.

Property owners can find their letter group by entering an address into Ecology’s Dirt Alert map and downloading documents found under “More information.”

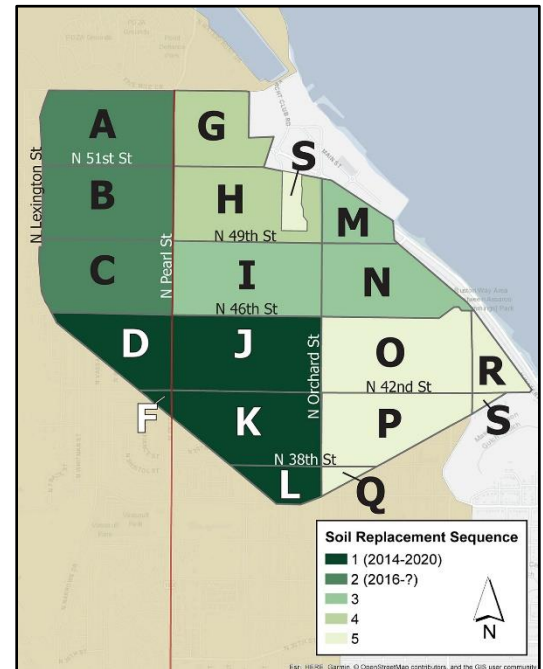


Figure 8: Soil replacement sequence inside the study area

Cleanup Progress

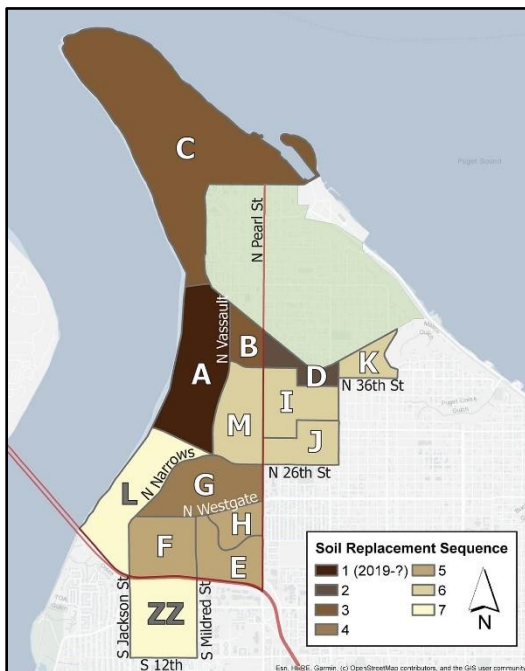


Figure 9: Soil replacement sequence outside the study area

We have been working since 2013 to remove and replace soil for qualifying properties located within the study area (see figure 10). A few challenges have impacted our progress. In 2017, the capital budget was delayed and thus, construction was delayed. In 2018, we put two projects to bid, but the bidding process did not result in executed contracts. We re-bid those projects in 2019. Over the last couple of years, Ecology has improved its contracting processes. This transition delayed yard replacement designs. However, we expect to see increased soil replacements, now that the process improvements are complete. In 2020, we plan to remove and replace soil on 49 yards.

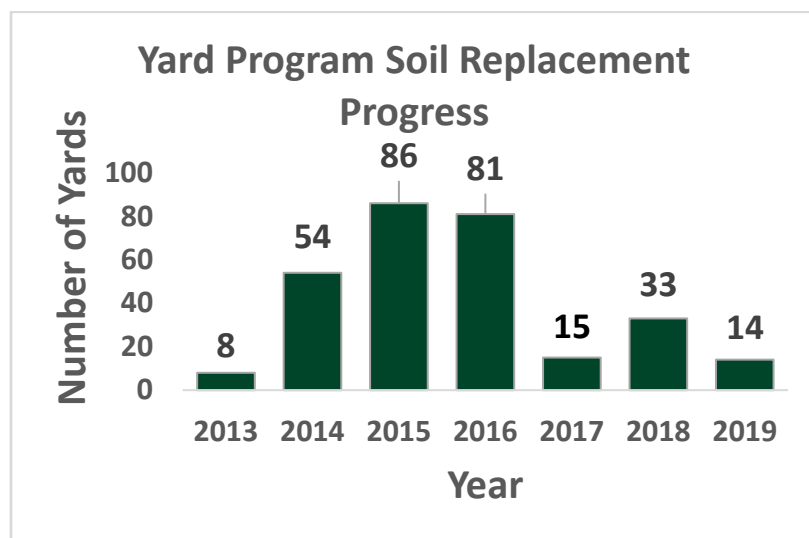


Figure 10: Bar graph of our soil replacement since it started in 2013

Ruston/North Tacoma Superfund area

After Superfund cleanup, remaining contamination still poses a risk

EPA study area is the one-mile radius around the former Asarco smelter. It is a federal Superfund site managed by the US Environmental Protection Agency (EPA) (see figure 11).

Work completed by EPA: From 1993 to 2012, the EPA oversaw Asarco's work to sample approximately 2,800 properties and cleanup up 1,600 properties.

EPA action level: Asarco only cleaned up areas that had arsenic levels over 230 ppm.

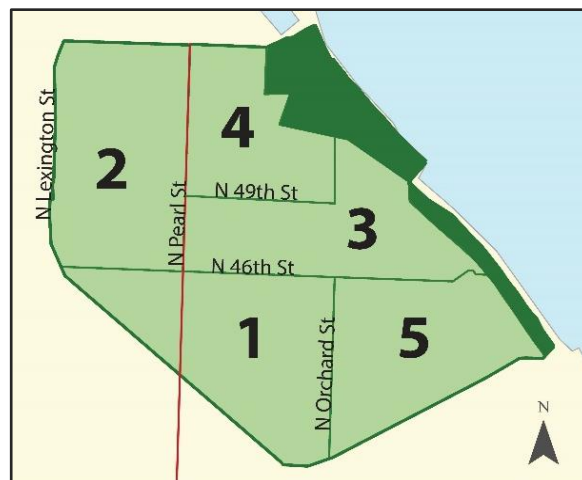


Figure 11: Map of EPA study area

Remaining contamination: Ecology is using Asarco settlement funds to clean up the 716 next contaminated yards in the EPA study area. These yards have average arsenic levels over 100 ppm. Many more properties are above the state cleanup level of 20 ppm. For these properties, the health department provides education and outreach, encouraging healthy behaviors.

Ecology continues to find soil above the EPA action level outside of the EPA study area.

Ecology identified 53 properties within the Yard Program service area with arsenic over the EPA action level. We have an agreement with the EPA that they will fund the soil replacement for yards that qualify over the EPA action level of 230 ppm or for yards whose owners had previously refused sampling. Since 2013, we have completed soil replacement on 36 properties and plan to work on an additional four properties starting in late 2019.

EPA Five Year Review: Local Health Department assists in efforts

Every five years since listing of the Commencement Bay/Nearshore Tidel flats as a Superfund site in 1983, the EPA has evaluated the effectiveness of their cleanup plan. In 2019, the Tacoma-Pierce County Health Department assisted with the evaluation efforts by administering an awareness survey to all residents within the EPA study area. Four hundred and fifty-seven residents participated in the survey that was sent out to 2,694 single-family residents. Through the survey, the EPA hoped to learn about residents' knowledge of the Tacoma Smelter Plume, remaining contamination in the plume, actions that prevent exposure to soil pollution, and how to find and understand soil sampling results.

Dirt Alert Map: Soil sampling and cleanup information at your finger-tips

With the launch of the new online map, Dirt Alert, one can easily access soil sampling and property specific cleanup information with their phone or computer (see figure 12).

The new online map gets 1,000 visitors a month, providing both programmatic information and data in one place. The new map makes it easier for residents, community members, and interested parties to find Tacoma Smelter Plume information when they need it most, whether at home or on the go.

Map link: <https://apps.ecology.wa.gov/dirtalert/>

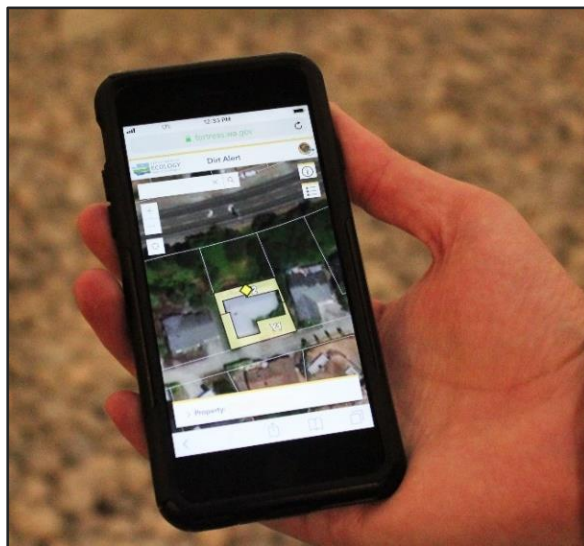


Figure 12: Dirt Alert Map

Education and Outreach Programs

Dirt Alert

Ecology, the Tacoma-Pierce County Health Department, and Public Health-Seattle and King County use the Dirt Alert program in their local communities to:

- Raise awareness about arsenic and lead contamination in the soil.
- Educate about ways to reduce soil contact.
- Encourage healthy behaviors to reduce health risks from contact with contaminated soil that include:
 - Wash hands after playing or working outside
 - Take off shoes at the door
 - Vacuum and damp-dust regularly
 - Cover bare patches of dirt where children play

Different Dirt Alert outreach methods are used to increase awareness about contaminated soil and healthy behaviors. Ecology tracks how many people are reached.

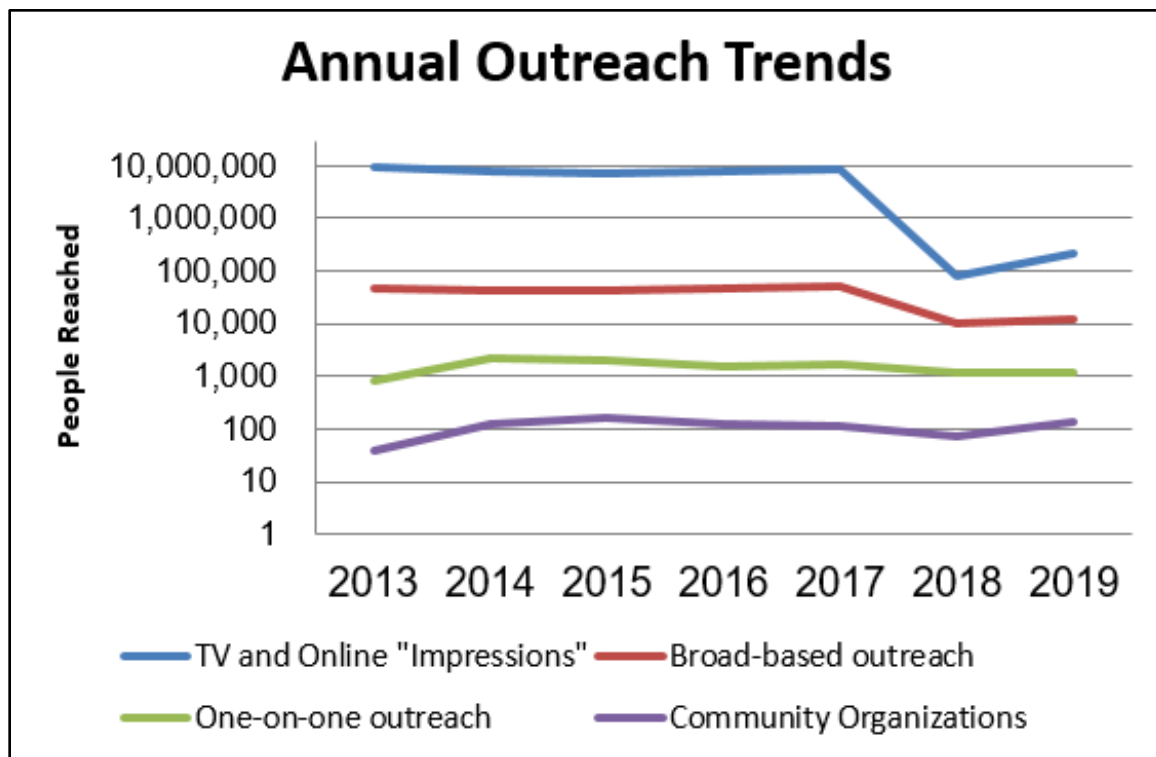


Figure 13: Dirt Alert statistics from October 1, 2013 to September 30, 2019

The figure shows the annual trends of the different outreach methods between October 1, 2013 and September 30, 2019. The methods include TV and online “Impressions”, One-on-one outreach, Broad-based outreach, and Community organizations.

- **Impressions** are the number of times a television or online ad runs multiplied by viewership.
- **Broad-based outreach** includes mailers and events (such as fairs, school handwashing presentations, and soilSHOP).
- **One-on-one outreach** includes home visits, soil testing, and email and phone inquiries.
- **Community organizations** includes work with community groups that help Ecology and the health departments educate the public about the Tacoma Smelter Plume and healthy behaviors.

The biggest change in trends is with “TV and online ad impressions.” Due to a delay in the capital budget in 2018, the health departments reprioritized their budget and ads were not run. Tacoma-Pierce County Health Department recently renewed their contract with CLICK TV. They expect this will result in an increase in Impressions and One-on-one outreach.

Priorities for Outreach

Arsenic and lead are toxic and can be harmful to human health. Children are especially vulnerable because they are still growing and are more likely to accidentally swallow contaminated dirt. Children and the adults that care for them are a priority for outreach.

The health departments use a wide range of outreach tools to help children and their parents, teachers, and childcare facilities understand the risks. These include soil sampling at childcares, teaching children to wash their hands, and free testing of soil at homes of people that live inside the soil safety area (see figure 19). This free testing is referred to as home soil testing in this report.



Figure 14: A front yard with kids playing on replaced soil

Partnership with the local health departments

Ecology provides funding to the Tacoma-Pierce County Health Department and Public Health – Seattle King County. The health department’s efforts include outreach and education at fairs and events, home soil testing, new resident contact, handwashing presentations at schools and a social marketing to promote healthy behaviors.

Public Health – Seattle King County partners with community grantees to help foster awareness about the Tacoma Smelter Plume and promote healthy behaviors to residents that might not otherwise be reached. So far this year they’ve partnered with the American Lung Association, Living Well Kent, Tilth Alliance, and TD Wang.

Home soil testing

Since 2011, Ecology and the health departments have provided home soil testing to over 2,000 people. This has proven to be an effective educational opportunity to promote healthy behaviors.

As of 2019, free home soil testing is available to Pierce County residents that live inside the soil safety program area, and outside of the yard program service area. In King County, free home soil testing is only offered to residents that live on Vashon.



Figure 15: Van used by Tacoma-Peirce County Health Department for outreach and education

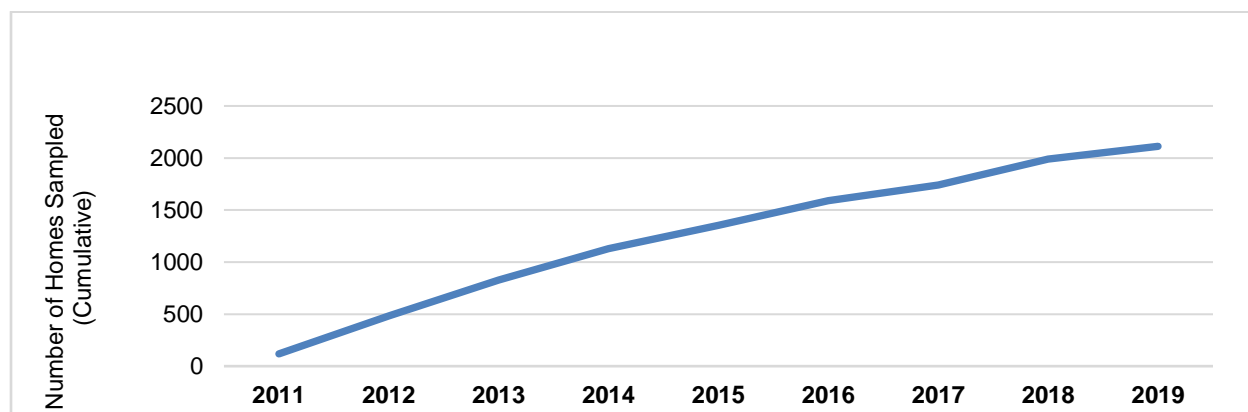


Figure 16: Number of residents receiving home soil testing between 2011 and 2019

Social marketing campaign and behavior change

While many residents are aware of healthy behaviors, they do not practice them regularly and the behaviors are not a part of daily lives. Ecology has teamed with the health departments in a social marketing campaign to assist local residents in changing their behavior to reduce exposure to lead and arsenic contaminated soil.

Each Health Department is focusing on one healthy action. They have recently piloted a social marketing strategy around the selected healthy action.

Tacoma-Pierce County Health Department launched a “Get Covered” pilot campaign for families with children living in the yard program service area, and EPA study area, that don’t qualify for yard soil replacement. The campaign encourages residents to reduce risks of contact with contaminated soil by covering up bare patches of soil where kids play in the yard.



Figure 17: Covering up bare patches of soil

Public Health – Seattle King County launched a “Take cleats off at the door” campaign that focused on Hispanic and Latino families in the Burien and Des Moines area. They worked with a social marketing firm, T.D Wang (TDW). TDW developed the campaign ‘to take cleats off at the door’ and recruited pledges as a mechanism to gather participant data, and to allow for follow up to measure behavior change.



Please take off your shoes

Por favor quítese los zapatos

Salud Pública
Seattle y el condado de King

Figure 18: Take off your shoes at the door

Soil Safety Program

Reducing the service area of the Soil Safety Program

The Soil Safety Program provides free soil sampling and replacement for child play areas. The program created in 2005, has sampled more than 1,000 play areas including schools, parks, childcares, camps and multi-family housing. As the Asarco settlement funds decrease, we reviewed the efficiency of the soil safety program. We evaluated sampling results and program costs. We found less than 2% of play areas sampled in King County (outside of Vashon-Maury Island) had arsenic or lead above cleanup levels. We reduced the Soil Safety Program service area to only Vashon-Maury Island in King County. The reduction of the service area will allow the program to continue serving new childcares in areas with higher contamination levels. The reduced boundary will encompass the existing boundary in Pierce County and include Vashon-Maury Island in King County. This is the second reduction in the program boundary since the start of the program.

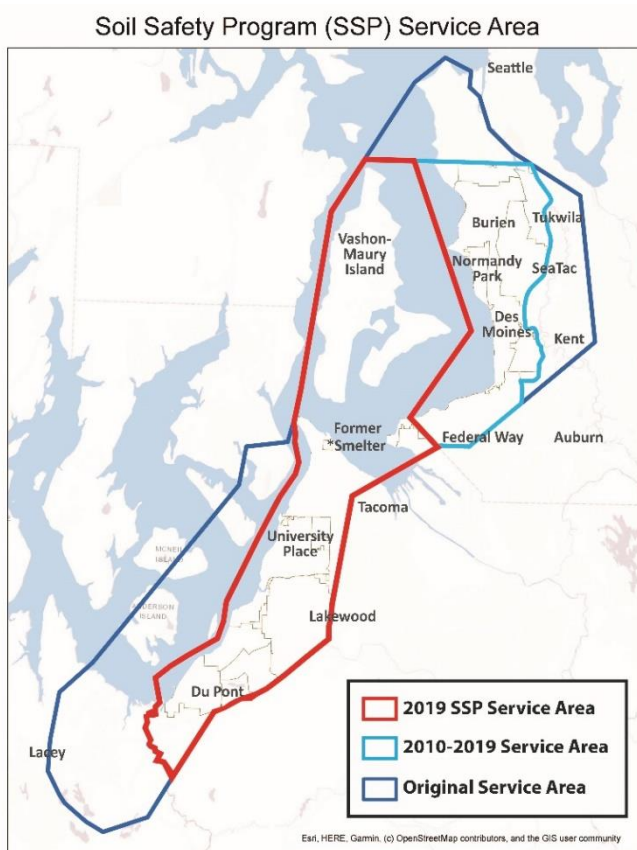


Figure 19: Soil Safety Program Service Area

(The dark blue outline shows the original boundary (2005-2010). The light blue and red lines show the boundary from 2010-2019. The new boundary is outlined in red.)

Soil Safety Program continues work in areas where children play

In FY 2019, Ecology assessed and sampled 22 play areas. We completed work at Sandy Shores Park on Vashon-Maury Island. We removed 67 cubic yards of soil from the private, community park. In FY 2020, we plan on addressing four childcares in Tacoma.

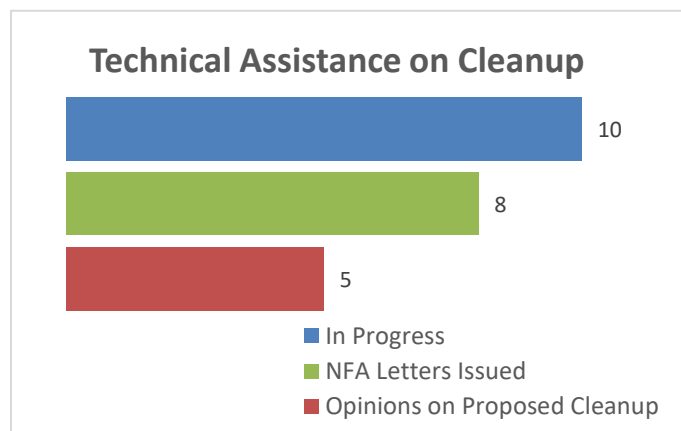


Figure 20: Sandy Shores Community Park undergoing soil replacement

Technical Assistance Program

Encouraging soil cleanup during development

Development necessitates soil disturbance during land clearing and grading. This is the best time to test for contamination and clean it. It is more cost effective and straightforward to cleanup soil before constructing buildings and roads.



Our Technical Assistance Coordinator works with local and state governments, developers, and landowners to streamline the cleanup of contaminated soil.

We collaborate with 18 local permitting offices in King, Pierce, and Thurston counties encouraging landowners and developers to sample and cleanup their properties prior to development.

Figure 21: Technical Assistance on cleanup in 2018-2019

Free technical advice for planned and completed cleanup projects.

Ecology provides free technical advice on planned and completed cleanup of contamination within the Tacoma Smelter Plume. We issue opinion letters on proposed cleanup and No Further Action (NFA) determinations when the cleanups meet state standard requirements. The opinion letters and NFA’s may help developers obtain necessary permits, loans, or sell the property in the future. Ecology issued eight No Further Action (NFA) determinations and five opinions on proposed cleanup. Overall, Ecology has issued 61 NFA determinations for properties within the Tacoma Smelter Plume.

Since 2006, landowners and developers cleaned up 837 acres of contaminated soil within the plume. In the past year, they cleaned up over 134 acres of contaminated soil through the Voluntary Cleanup Program (VCP). Landowners, developers, and public agencies test the soil while conducting projects within the Tacoma Smelter Plume. Sampling follows Ecology’s comments during environmental permit review. To date, 453 acres of land sampled by landowners have tested below state cleanup levels for arsenic and lead. Lands that tests below state cleanup do not enroll into the VCP.

Summer Lane development—integrating cleanup into development

Summer Lane is a single-family development in University Place, Pierce County. In 2018 and 2019, the developer incorporated soil cleanup into the property development. They mixed the upper contaminated soil layer with deeper, cleaner soil layers. Mixing of soil dilutes arsenic and lead concentrations to below state cleanup levels. Mixing works well if the arsenic and lead are below a certain level. The contamination within the Summer Lane development was low enough to qualify for mixing.

The contamination extended to a forested area surrounding a wetland in the northeast corner of the property. That area, designated as a critical area could not be developed, but because the soil tested above the state cleanup, it had to be addressed. The developer added a clean soil mulch blend and mixed it with the soil in the forest buffer area with hand tools to avoid disturbing the existing vegetation. Ecology reviewed the cleanup report submitted after cleanup and determined that the cleanup met state cleanup requirements. Ecology issued a No Further Action determination in April 2019.



Figure 22: The developer built play areas on cleaned land



Figure 23: The developer built residential homes on cleaned land

Interim Action Plan

The 2012 Interim Action Plan describes how Ecology will use the \$94 million settlement to address the contamination and manage risk from the Tacoma Smelter Plume. Interim actions will lower risks to human health and the environment by addressing pathways through which children, residents, gardeners, construction workers, and other groups are exposed. Ecology proposed a mix of physical cleanup — digging, mixing, or capping — and institutional controls which restrict access to contaminated soil. Ecology proposed two phases of interim actions.

Phase One

Phase One focuses on areas where children play and people live in the highest contaminated areas of the plume. It constitutes the four major actions listed on page 11.

Phase Two

Phase Two looks at areas not covered in Phase One. The majority, though not all, of these properties are likely to have moderate contamination (average arsenic 20-100 ppm). Our goal is to find sustainable solutions that incorporate managing risk from the Tacoma Smelter Plume into the day-to-day business of local government, development, and real estate. We need to continue awareness of the contamination and healthy behaviors.

Real Estate Transactions

For real estate transactions, we are focused on informing buyers of potential contamination before they purchase a home. Some options we are reviewing:

- Raise awareness through continuing education courses for real estate agent relicensing.
- Create a pamphlet or handout similar to the one for lead based paint to provide to buyers at time of sale.
- Use deed notices for remaining soil contamination on a property.

Addressing soil contamination during development

Through our technical assistance program, Ecology is working with local government and developers to address soil contamination during development (see page 26). Ecology provides comments to the local government during the State Environmental Policy Act (SEPA) review of the development project. This only captures those projects that trigger SEPA and is late in the development project timeline. Ecology is researching options that require sampling and cleanup and notify the developer sooner in their process:

- Encourage local governments to add Tacoma Smelter Plume information on their websites used by developers.
- Encourage local governments to adopt ordinances that require soil sampling and cleanup.
- Revise the SEPA checklist form (197-11 WAC) to ask about Tacoma Smelter Plume contamination.

Working with other agencies

Integrating soil contamination issues into the day-to-day work of other agencies that manage or regulate land is a vital long-term strategy. Our proposed actions include:

- Require soil sampling and cleanup for projects involving soil moving at facilities managed by state agencies and local governments.
- Provide agencies with outreach tools.
- Help agencies with best management practices to address soil contamination.
- Work with agencies to address contamination during new park and school development.

Key agencies include:

- Department of Children, Youth, and Families (DCYF)
- State Board of Health (SBOH)
- Office of the Superintendent of Public Instruction (OSPI)
- Department of Labor and Industries
- Washington Department of Transportation (WSDOT)

Conclusion

Services to residents within the plume area

With the funding provided by the Asarco settlement we provide free soil sampling and replacement through the yard program, and in areas where children play. We assist landowners in cleaning up contamination during property and development and provide outreach to increase awareness and promote healthy behaviors.

2019 Accomplishments and Highlights

Yard Program

The Yard Program provides free soil sampling and cleanup for residential yards in the most contaminated areas of the Tacoma Smelter Plume. This program is voluntary and property owners can opt-in for soil sampling and soil replacement. We've offered sampling to all properties in our Yard Program service area and sampled all properties that granted us permission. Out of 1,191 properties that qualify for soil replacement, we removed and replaced soil on 290 properties. In 2019, we replaced soil on 14 properties on Vashon- Maury Island. For now we are complete with our soil sampling and soil replacement work on the island. We will continue to offer soil sampling and soil replacement to new homeowners. This sampling may result in future soil replacement work on Vashon-Maury Island.

Soil Safety Program

The soil safety program provides free soil sampling and replacement for child play areas. In 2019, we assessed and sampled 22 play areas and identified three additional play areas that qualify for soil replacement. We completed work at Sandy Shores Park on Vashon- Maury Island. We removed 67 cubic yards of soil from the private community park. In 2020, we plan on addressing four childcare facilities in Tacoma.

Outreach and Education

Ecology has teamed up with the local health departments in a social marketing campaign to inform local residents about their exposure to contaminated dirt and actions they can take to reduce contact. Tacoma- Pierce County Health Department has reached over 5,000 residences with their message in the past year. They have launched a "Get Covered" pilot campaign for families with children living in the yard program service area and EPA study area. This campaign encourages residents to reduce risks of contact with contaminated soil by covering up bare patches of soil where kids play in the yard. Public-Health-Seattle King County launched a "Take cleats off at the door" campaign that focused on Hispanic and Latino families in the Burien and Des Moines area.

Technical Assistance

Ecology's Voluntary Cleanup Program assisted landowners and developers to clean up over 134 acres of contaminated soil. We issued eight No Further Action (NFA) determinations and five opinions on proposed cleanup.

Interim Action Plan and Phase Two

We are researching options to address soil contamination through real estate transaction and during development.

Site Information

You can find more information about the Tacoma Smelter Plume by visiting the web pages for Tacoma Smelter Plume cleanup: <http://ecology.wa.gov/Tacoma-smelter>.

For more information about the Toxics Cleanup Program, visit our website: <https://ecology.wa.gov/About-us/Get-to-know-us/Our-Programs/Toxics-Cleanup>.