

# Tacoma Smelter Plume Yard Program Design

**March 28, 2013**

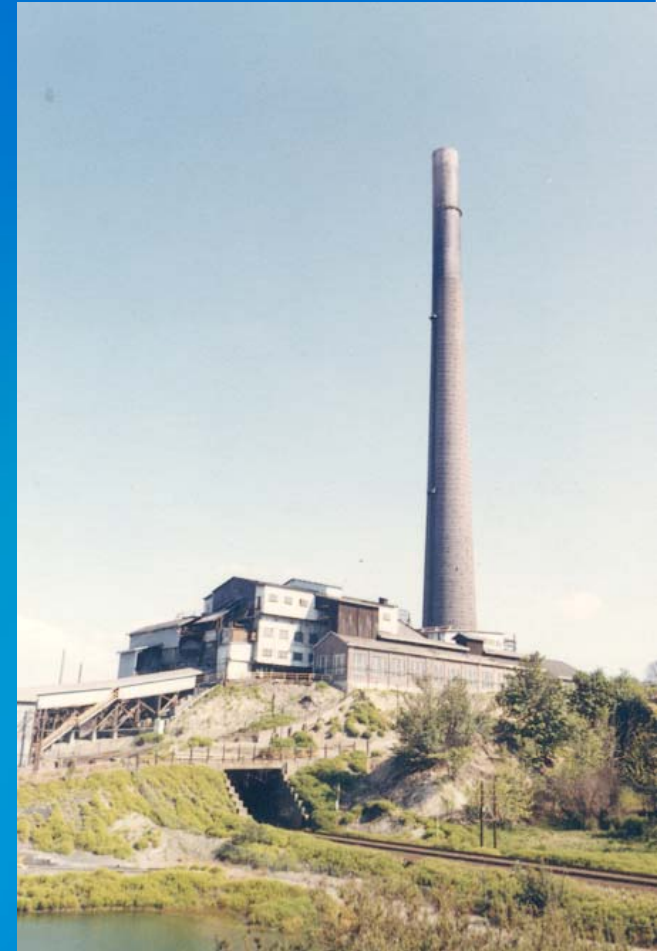
**Point Defiance Elementary School**



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

# Topics

- Asarco Background
- Yard Program Design
  - Service area
  - Access and sampling
  - Qualifying for cleanup
  - Cleanup and restoration
  - Arsenic in soil database
  - Schedule and sequence



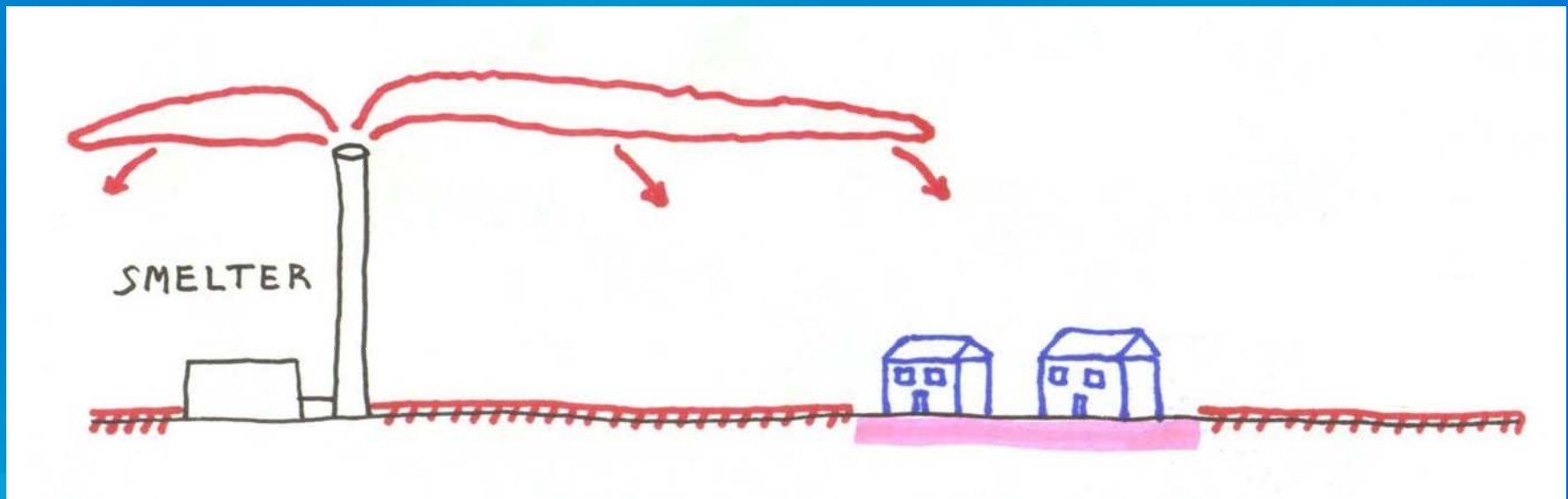
# Asarco Smelter History

- **1890-1986:** Smelted lead, copper, and high arsenic ores
- **1983:** Became a Superfund site
- **1993:** EPA yard cleanup began in Ruston and north Tacoma



# Tacoma Smelter Plume

- Arsenic, lead, other heavy metals
- Settled on surface soils
- Amount of contamination found varies



# Asarco Settlement-Supported Work

Action	Where	Target
Continue outreach and education	Whole plume	Children, parents, teachers, gardeners, workers
Continue the Soil Safety Program	Arsenic >20 ppm	Children
Technical assistance	Whole plume	Local governments, developers, residents outside Yard Program service area
Yard cleanup program	Arsenic >100 ppm	Residents

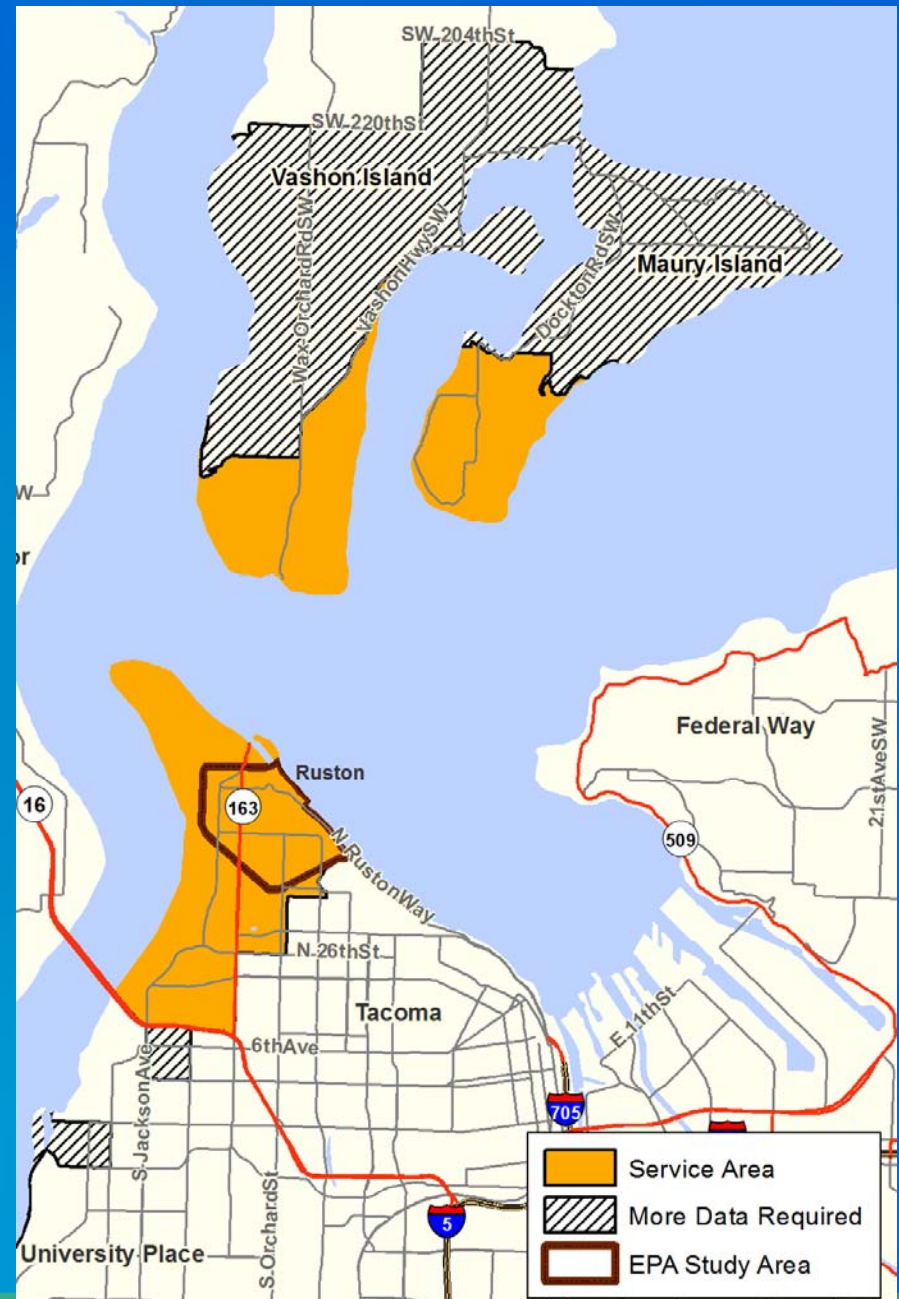
# Yard Program Overview

- Existing residential
- State-led
- Voluntary

## Action Levels

Average arsenic = 100 ppm

Average lead = 500 ppm



# Yard Program Overview

Outside EPA Study Area

Inside EPA Study Area

Soil sampling

Previous sampling data evaluation

Results above action levels



Cleanup

Restoration

# Sampling Access Outside of the EPA Study Area

- Three opportunities
  1. Letter in the mail
  2. Knock on the door with door hanger
  3. Second knock on the door
- Homeowner can decline
  - “Out of the program” letter





# Sampling

- Schedule appointment
- Determine property size
- Lay out units

Small Lot < 0.25 acres



Large Lot > 0.25 acres

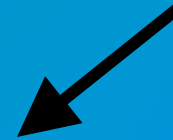
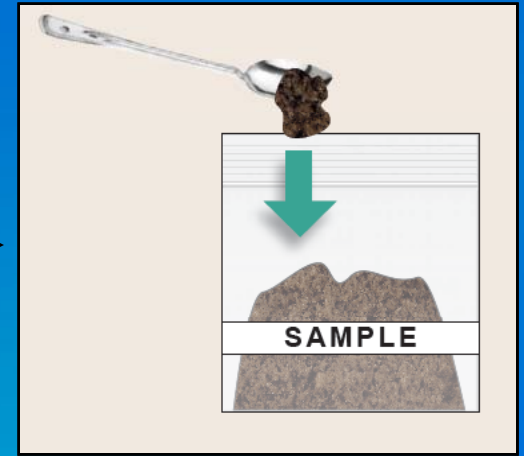
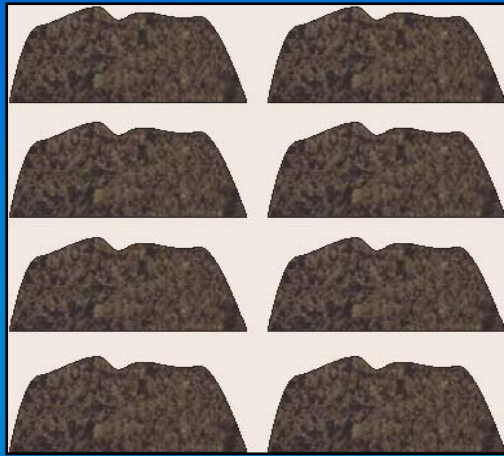


# Sampling

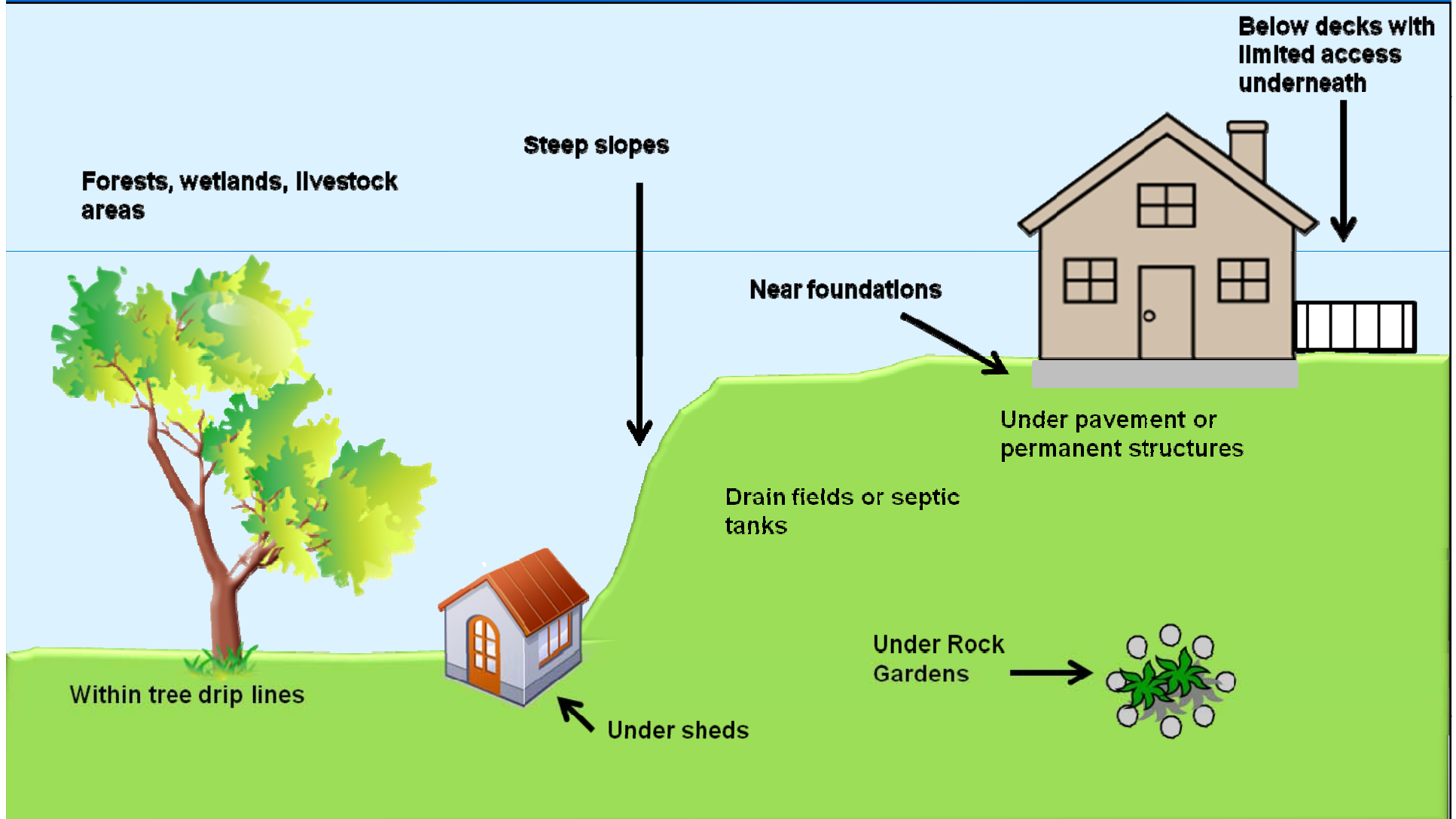
- Take 8 subsamples/unit



# Sampling



# Areas Excluded from Sampling and Cleanup



# Qualifying for Cleanup: Sampled by Ecology's Yard Program

- Any units with arsenic  $\geq 90$  ppm or
- Lead  $\geq 500$  ppm.

Only unit 1  
qualifies for  
cleanup



## Unit 1

As = 210 ppm

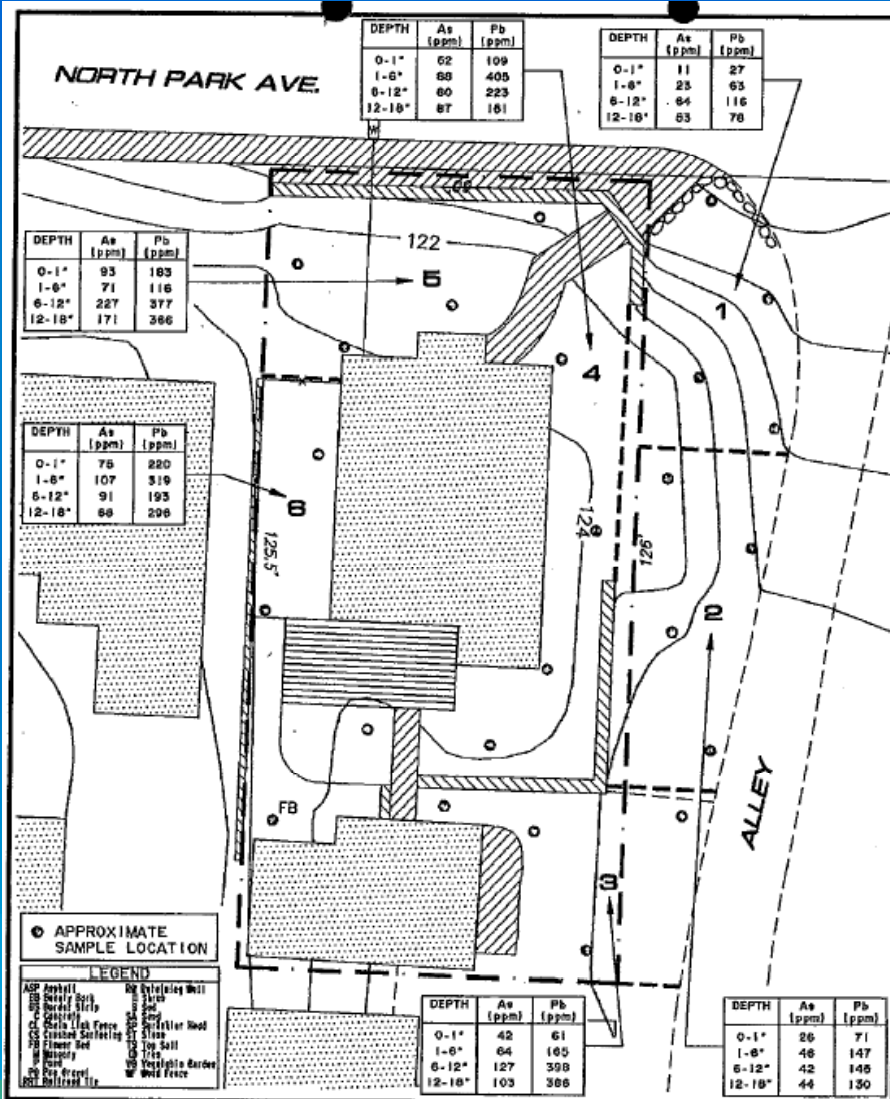
Pb = 400 ppm

## Unit 2

As = 20 ppm

Pb = 400 ppm

# EPA Sampling Results



ASRS01 - Ruston Remediation

PRE-REMOVAL SAMPLE RESULTS

Remed Program

SITE ADDRESS	NAME	SITE CODE
		AF01

SUBUNIT	DEPTH	ARSENIC (mg/kg)	LEAD (mg/kg)	EPA RECOMMENDED REMOVAL DEPTH
1	0 - 1	11	27	NONE
1	1 - 6	23	63	
1	6 - 12	64	116	
1	12 - 18	53	78	
2	0 - 1	26	71	NONE
2	1 - 6	46	147	
2	6 - 12	42	145	
2	12 - 18	44	130	
3	0 - 1	42	61	NONE
3	1 - 6	64	165	
3	6 - 12	127	398	
3	12 - 18	103	386	
4	0 - 1	52	109	NONE
4	1 - 6	88	405	
4	6 - 12	80	223	
4	12 - 18	87	151	
5	0 - 1	93	183	NONE
5	1 - 6	71	116	
5	6 - 12	227	377	
5	12 - 18	171	366	
6	0 - 1	75	220	NONE
6	1 - 6	107	319	
6	6 - 12	91	193	
6	6 - 12	68	296	
<b>DEPTH</b>		<b>ARSENIC MEAN (mg/kg)</b>	<b>LEAD MEAN (mg/kg)</b>	
0 - 1		50	112	
1 - 6		67	203	
6 - 12		100	250	
12 - 18		92	222	

NOTE: Arsenic Action Level = 230 mg/kg Lead Action Level = 500 mg/kg

SampRpt2 v1.0 11/93

Hydrometrics, Inc 12/09/94

# Ecology Reviews Your Results

- Average the 0-1" and 1-6" depths
- Look at 6-12"

ASRS01 - Ruston Remediation      PRE-REMOVAL SAMPLE RESULTS      Remed Program

SITE ADDRESS	NAME	SITE CODE
6002 NO Park Av	Jonathan R Holland (Owner) (206)756-9639	AF01

SUBUNIT	DEPTH	ARSENIC (mg/kg)	LEAD (mg/kg)	EPA RECOMMENDED REMOVAL DEPTH
1	0 - 1	11	27	NONE
1	1 - 6	23	63	NONE
1	6 - 12	64	116	NONE
1	12 - 18	53	78	NONE
2	0 - 1	26	71	NONE
2	1 - 6	46	147	NONE
2	6 - 12	42	145	NONE
2	12 - 18	44	130	NONE
3	0 - 1	42	61	NONE
3	1 - 6	64	165	NONE
3	6 - 12	127	398	NONE
3	12 - 18	103	386	NONE
4	0 - 1	52	109	NONE
4	1 - 6	88	405	NONE
4	6 - 12	80	223	NONE
4	12 - 18	87	151	NONE
5	0 - 1	93	183	NONE
5	1 - 6	71	116	NONE
5	6 - 12	227	377	NONE
5	12 - 18	171	366	NONE
6	0 - 1	75	220	NONE
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# Evaluation of EPA Results

- Compare 0-6" and 6-12" results to criteria

	Arsenic	Lead
Parcel average	≥90 ppm	≥500 ppm
Subunit maximum	≥200 ppm	≥1,000 ppm

- Only subunits ≥90 ppm qualify for cleanup
- Yards with a 6" cap are lower priority

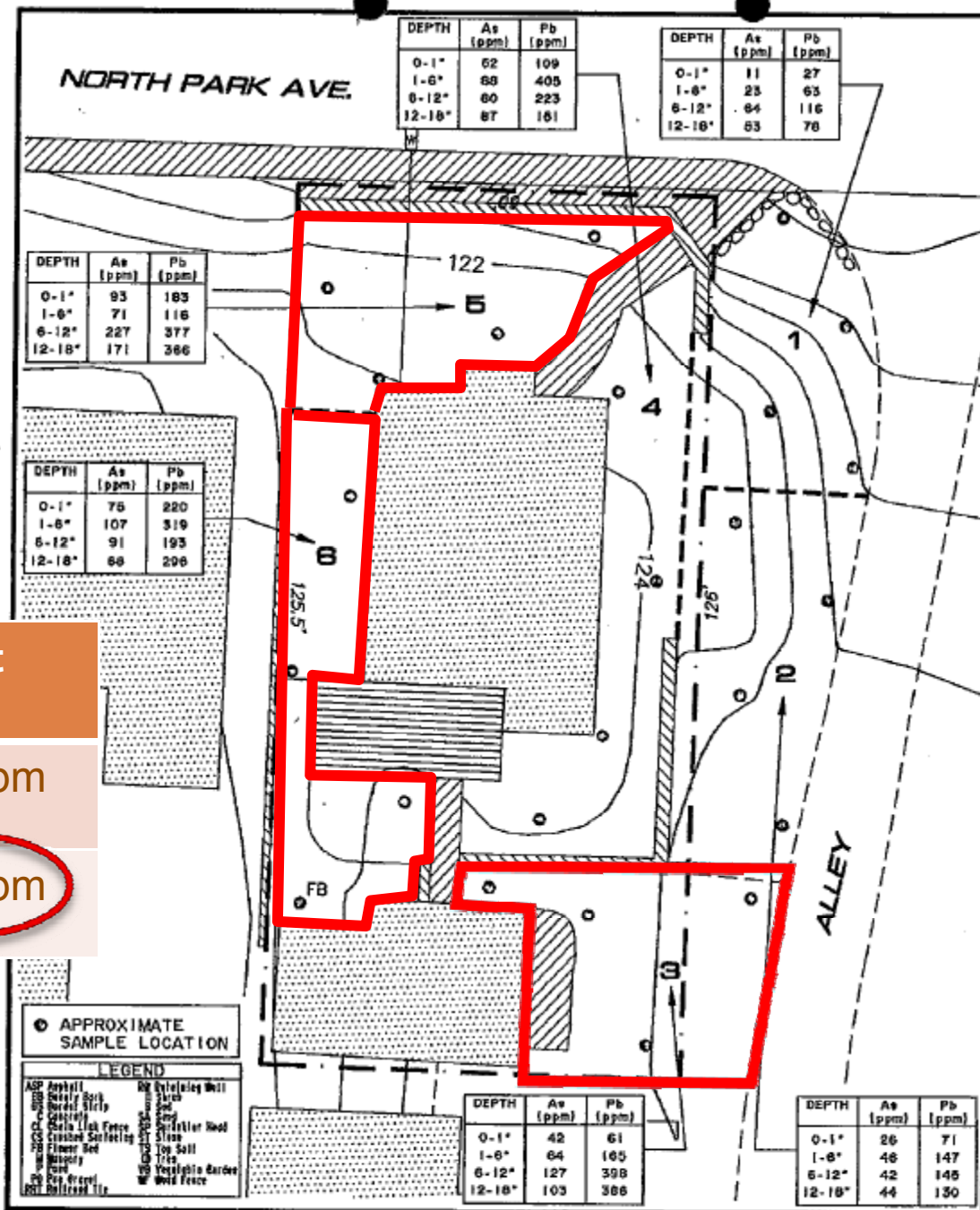


For example...

EPA Property qualifies for cleanup

Depth	Parcel average	Subunit max
0-6"	64 ppm	101 ppm
6-12"	100 ppm	227 ppm

Subunits 3, 5, 6 are >90 ppm



# Sampling Results Letters

## Sampled by Ecology or EPA


- Letter with results and outreach materials
  - **Above 90 ppm** → qualifies for cleanup
    - Phone call to schedule home visit
  - **20-89 ppm** → recommend reducing contact with soils
  - **Under 20 ppm** → below state cleanup level

# If You Qualify for Cleanup...



# Cleanup Plan

Key:

Unit 1 = 

Unit 2 = 

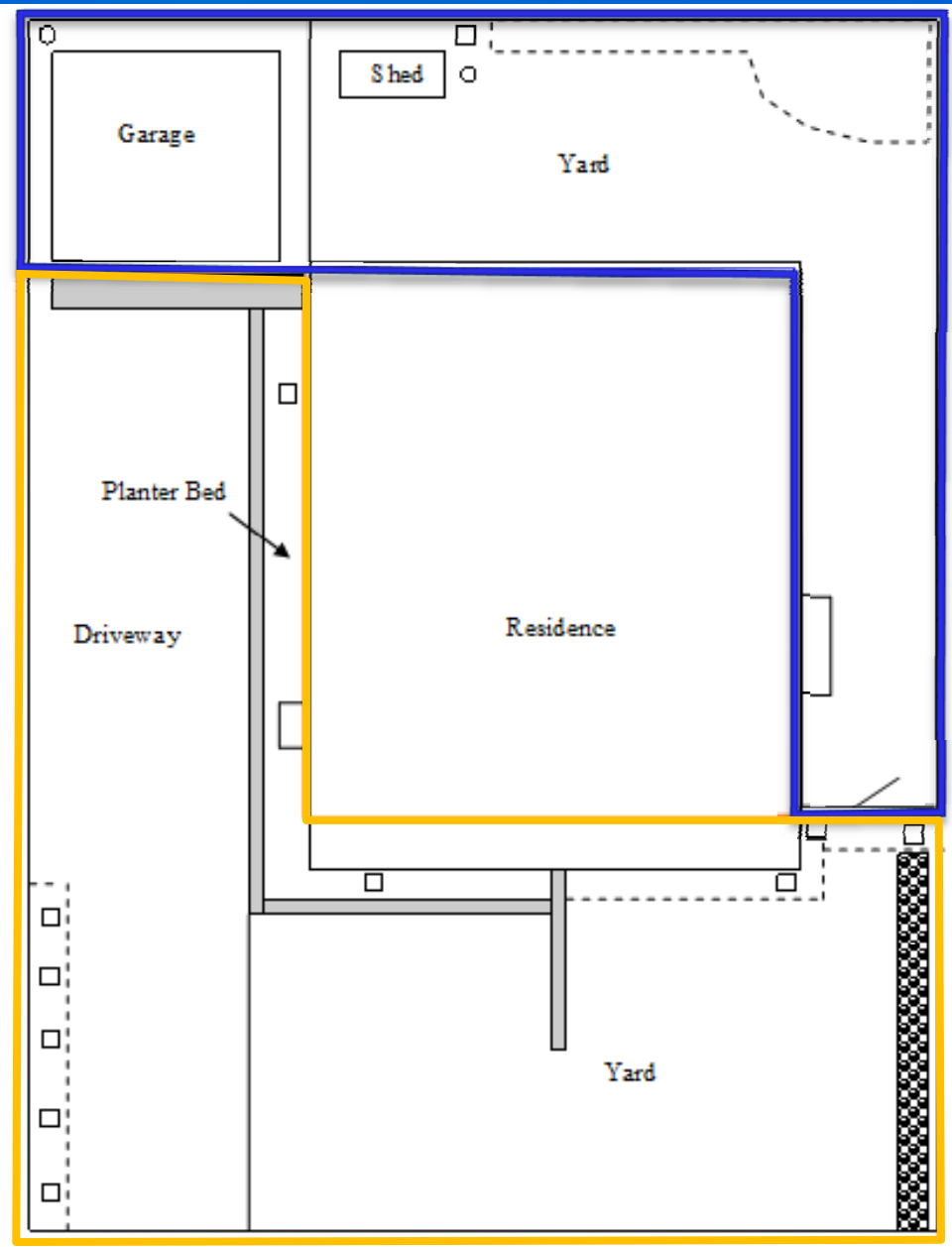
Tree = 

Large Shrub = 

Planter beds = 

Rock Wall = 

Concrete = 



# Cleanup includes...

- Remove the top 12 inches or
- Remove the top 18 inches



# Cleanup includes...

Take samples and review results

If  $\geq 200$  ppm – dig 6 more inches

If  $\geq 100$  ppm – lay geotextile fabric



# Cleanup includes...

- Restore landscaping



# Yard Restoration Options

1. Restore to existing
2. Replace some or all lawn with mulch and small plants
3. Possible rain garden option



*Homeowners must water and maintain landscaping*





# Arsenic in Soil Database



## Arsenic in Soil (AREIS)

Find Property



### Project Information

#### Arsenic and lead in the soil

The mining company Asarco once operated two copper smelters in Washington State; in Everett and Tacoma. Emissions of arsenic and lead contaminated soils for miles around the former stacks.

[Information about arsenic and lead](#)

The [Tacoma Smelter Plume](#) covers 1,000 square miles of King, Pierce, and Thurston counties. The [Everett Smelter](#) contaminated northeast Everett. Ecology and [EPA](#) have been cleaning up yards and play areas in both plumes since 1993.

[Healthy Actions to reduce contact with soil](#)

#### Search here for soil sampling results and cleanup records!

Right now, the database only has records for 2,000 properties in Ruston and north Tacoma.

**Contact**  
[Nida Taylor](#)  
360-407-6248

1. Enter your address or parcel number and click "search."
2. You will see a map of the area.
3. The property you searched for should be in the center of the screen. Click on the dot, check the address and see what records are available.

#### I can't find my property/I live outside of north Tacoma

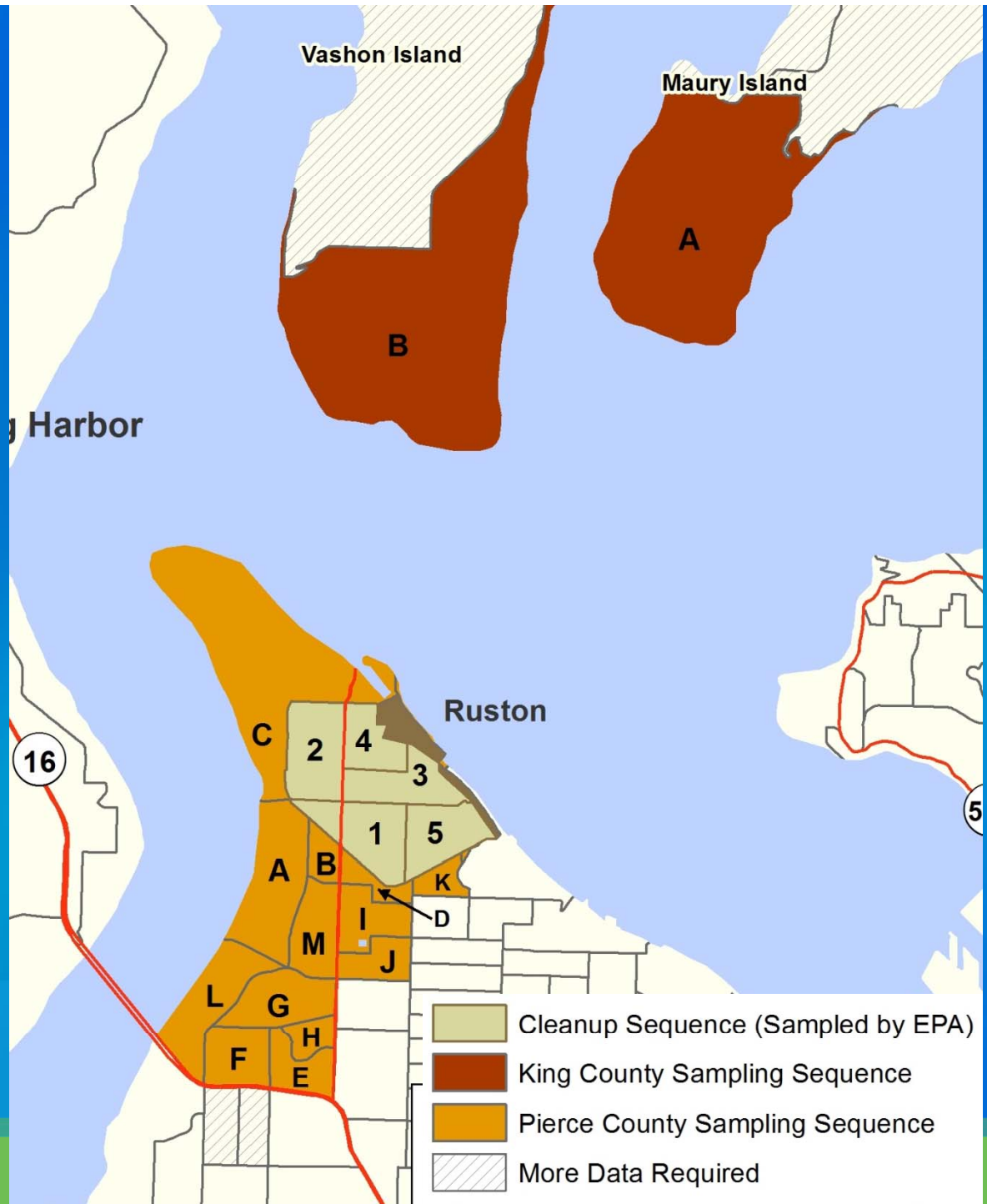
Within the next year, we plan to add records for the Everett smelter cleanup and more areas of the Tacoma Smelter Plume.

### Search for a Property

(do not include the city or state)

- OR -



# Cleanup and Sampling Schedule

2013

- Cleanup: start 15 homes in EPA Study Area

2014

- Cleanup: 50+ homes inside study area
- Sampling: Vashon-Maury Island and Tacoma (outside EPA Study Area)

2015 - 2021

- Continue Cleanup of EPA Study Area
- Continue Sampling
- Begin Cleanup in Tacoma and Vashon Island

# Public Comment Period

- Submit comments by April 29, 2013
- We need input on:
  - The program design.
  - Sample materials for homeowners.
  - How to encourage participation.

# Comments or Questions?

## Contact

Amy Hargrove, Remediation Manager

Email: [Amy.Hargrove@ecy.wa.gov](mailto:Amy.Hargrove@ecy.wa.gov)

Phone: (360) 407-6262

Website: [ecy.wa.gov/toxics/tacoma-smelter.html](http://ecy.wa.gov/toxics/tacoma-smelter.html)

