Vashon-Maury Island Annual Review Of Soil Contamination Studies: Where We've Been, Recent Study Release, And Where We're Going

WASHINGTON STATE DEPARTMENT OF ECOLOGY

WHERE WE'VE BEEN

The ASARCO Tacoma Smelter operated in Ruston, Washington for almost 100 years before closing in 1986. Starting in the 1970s, numerous studies were performed to evaluate environmental impacts from smelter operations. Many of those studies investigated soil contamination by arsenic, lead, and occasionally other smelter-related metals. However, through 1999, no comprehensive investigations of the spatial patterns in soil contamination over longer downwind distances had been performed. Studies at other large smelters world wide have shown soil contamination is detectable to distances of up to 30 miles or more.

In 1999, Public Health - Seattle & King County [PHSKC], with Ecology designed the first comprehensive survey of soil contamination by arsenic, lead, and cadmium covering all of Vashon-Maury Island and shoreline areas along the King County Mainland northeast of the smelter. That investigation is referred to as the *Vashon-Maury Island (VMI) Phase I Study*. This study design targeted areas where the soil was identified as being the least disturbed in recent years (such as off-trail forested areas) to look at the worst case scenario of contamination. (Soils that have been moved or landscaped may have lower levels of the contaminants. The worst case scenario method is standard public health practice and was chosen to provide the most protection for health and to focus further study on the most contaminated areas first.) The results of the Phase I Study, released July, 2000, showed a pattern of elevated arsenic and lead concentrations, consistent with deposition of smelter emissions.

RECENT CHILD USE AREA STUDY

Under an extended Site Hazard Assessment grant from Ecology, PHSKC releases results of a study (June 12, 2001) analyzing soils at 34 public child-use areas on Vashon-Maury Island. This second study is referred to as the *Vashon-Maury Island Child-Use Areas Study*. Study design focused on soils in developed areas where numbers of children could have soils contact (e.g., parks, schools, camps, day cares, and beaches).

FUTURE STUDY RESULTS

Under the Site Hazard Assessment [SHA] grant, the *Vashon-Maury Island Phase I* and *Child-Use Areas* studies will be followed by a third in the series of studies begun in 1999. This current study will evaluate soil contamination levels and spatial patterns over approximately 200 square miles of the King County mainland northeast of the smelter. This *Mainland Phase I Study* continues the evaluation of the magnitude and extent of soil contamination. In design it closely follows the *Vashon-Maury Island Phase I Study*; for example, it also focuses sampling in relatively undisturbed forested areas. The comparability in design will make it possible to combine results from the two Phase I studies in evaluating the "footprint" of soil contamination from smelter emissions. This study will be available Fall 2001.

FACT SHEET:
JUNE 2001

ANNUAL UPDATE:
Site Hazard Assessment Grant with Public Health Seattle & King County

COMPLETED STUDIES:
VMI Phase 1 Study – 1999
VMI Health Data Report – 2001
University Place Background Study -- 1999
University Place Residential Arsenic Survey – 2001
VMI Child Use Area Study - 2001

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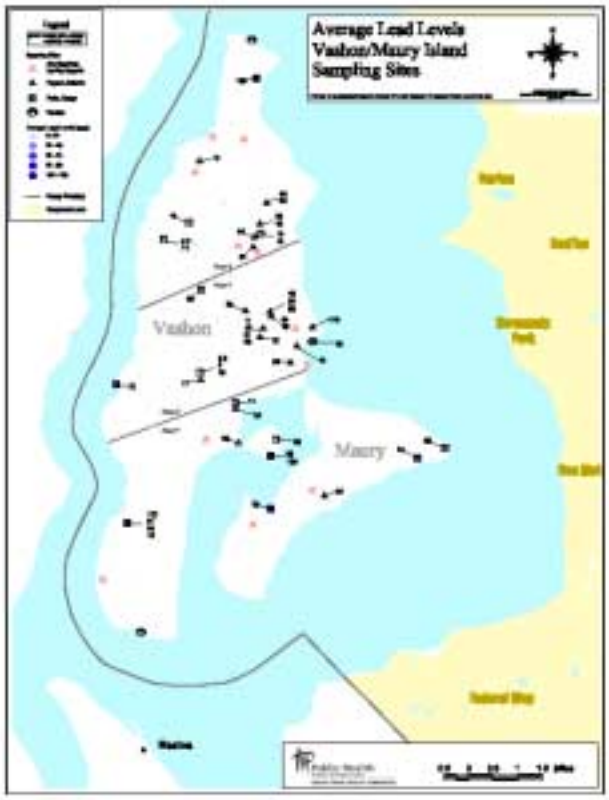
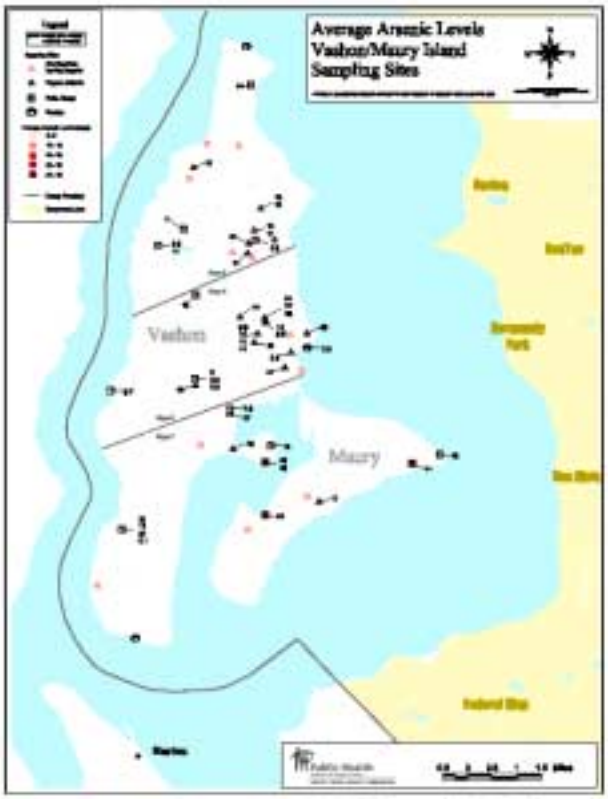
Publication No. 01-09-036
If you have a special accommodation need, please call Molly Gibbs at (360) 407-6179 or (360) 407-6006 (TDD)

(Phase 1) Undisturbed Area Maps





(Phase 2) Child Use Area Study Maps
http://www.ecy.wa.gov/programs/tcp/sites/tacoma_smelter/ts_hp.htm

Summarized Findings

Findings from the *Vashon-Maury Island* *Phase 1 Study* (undisturbed areas) include:

- Arsenic and lead tend to be found together. This is consistent with the expected pattern of fallout occurring from the Ruston smelter operation.
- Arsenic concentrations ranged from "Not Detectable" to 460 ppm. Lead concentrations ranged from "Not Detectable" to 1300 ppm.
- Arsenic and lead concentrations can vary by several hundred percent, even over distances of as little as 50 feet. This means that levels of arsenic and lead found in soil in nearby areas may not be a reliable measure of arsenic and lead on specific residential properties on Vashon-Maury Island or on the mainland coastline of southern King County.
- The highest concentrations of arsenic and lead are found on Maury Island and South Vashon Island, followed by the mainland, followed by North Vashon Island. This is consistent with previous studies of fallout from the Ruston smelter plant.

Findings from the *Vashon-Maury Island Child Use Areas Study*

Of the 34 different child use areas, the highest concentration of arsenic found in the study was 130 ppm. Average arsenic concentrations in the top six inches of soil for the 34 child-use areas tended to be much lower — ranging between 4 to 50 ppm. The state cleanup standard for arsenic in residential soils is 20 ppm. The highest concentration of lead found in the study was 900 ppm. Again, average lead concentrations in the top six inches of soil for the 34 child-use areas tended to be much lower — ranging between 8 to 180 ppm. The state cleanup standard for lead in residential soils is 250 ppm. The arsenic results can be compared to two numbers, the Interim Action Trigger Level —which is 100 parts per million (ppm) for schools and daycare centers, and 200 ppm for parks, camps and beaches — and the state cleanup level which is 20 ppm as set by state cleanup law. Ecology has determined that school and daycare areas exceeding 100 ppm are high enough to warrant fast action to ensure child safety. Areas with average arsenic concentrations between 20 ppm and 100 ppm are being addressed in the near-term through recommended adoption of community protection measures. Long-term exposure poses unacceptable risk under state law. These areas will be addressed as part of the long-term cleanup plan.

Similar to arsenic, the lead results can be compared to the Interim Action Trigger Level — 700 ppm for schools and day care centers, and 1000 ppm for parks, camps and beaches — and the state cleanup level, which is 250 ppm.

In summary:

- Contaminant levels in public child use areas are generally lower than contamination in undisturbed areas.
- Adoption of the Community Protection Measures is strongly recommended to protect health of both children and adults while long-term solutions are sought over the coming years.

Average Results in Top 6 Inches of Soil

	Max	Range	State	Interim Action Level	
			Standard	Daycare	Parks
Arsenic	130 ppm	4-50 ppm	20 ppm	100 ppm	200 ppm
Lead	900 ppm	8-180 ppm	250 ppm	700 ppm	1000 ppm

Accomplishments to Date

Summer, 1998:
First reports of elevated As and Pb at Lone Star NW (now Glacier NW) gravel pit on Maury Island

February 2, 1999:
First meeting about As and Pb on the island. While the gravel mine and smelter plume issues are separate, agencies' concerns are focused on health and community protection

February 25, 1999:
First meeting between PHSKC and Ecology with VMI residents, to design first sampling, of undisturbed area soils. Site Hazard Assessment (SHA) grant initiated

March 3, 1999:
First formal meeting with Lone Star NW; resulted in a monitored containment facility for contaminated soils as part of the draft Environmental Impact Statement prepared by King County Dept of Development and Environmental Services (DDES)

June, 1999:
Ecology wide area [soil] contamination work group culminates in development of Orchard Lands pilot study

August, 1999:
Lone Star NW Draft EIS issued, Ecology comments completed

August 26, 1999
Ecology, PHSKC and citizen advisors begin process of updating public health advisory documents on health precautions

Oct. 1999 – May, 2000:
Pacific Groundwater Group implements SeaTac and Maury Island Groundwater Studies

April 2000:
Data from *VMI Phase 1 Study* validated, reviewed by Greg Glass, PHSKC and Ecology .Ron Simms announces study preliminary report findings at press conference. PHSKC website makes information available.

NEXT STEPS:

Pre-Remedial Investigation will continue, as part of the Mainland King County "Tacoma Smelter Plume" project. Additional sampling continues, with a focus on the extent of contamination and on targeted child use areas. Tracer element studies will be conducted to verify the connection to smelter-specific arsenic. Community Protection Measures are strongly recommended for adoption on VMI. Ecology plans to work with local governments and citizens to identify and address cleanup issues.

Local stakeholder groups, with representatives from Vashon-Maury, Pierce and So. King County are forming to address various community needs. Interests to date focus on property ownership, real estate and development, school, day care, parks and camps operators, planning and permit officials. For more information, please contact Molly Gibbs, Public Involvement Coordinator, at (360) 407-6179, or email mgib461@ecy.wa.gov.

Funding Sources to be Located

Ecology is looking into additional funding sources for soil cleanup. The Model Toxics Control Act authorized a remedial action grant program, funded by a tax on certain hazardous substances. Local government or public entities can apply for 50% of funds required to clean up a site. Voluntary Cleanups may be conducted with technical assistance from Ecology (see website at http://www.ecy.wa.gov/programs/tcp/VCPmain.htm.)

Over the next two years, these funds are committed to numerous priorities currently identified by the Toxics Cleanup Program. The challenge of the Tacoma Smelter Plume Project, of which VMI is a part, is the competing priorities for these funds. Ecology is in the process of developing:

- Model (standard) Remedies for clean up of arsenic and lead contaminated soils on child use areas;
- Interim Action Trigger Levels. We are currently seeking public comment on the process used to determine these levels; and
- Standardized sampling guidance for property owners (to be available December, 2001.)

Points of Emphasis

1. This project is *big*, potentially involving properties over more than a 200 square mile area. We need to prioritize where to initially focus any needed cleanup actions.
2. We have very limited resources, both in terms of funding and staff to support the work involved.
3. The soil contamination took place over nearly one hundred years, and it will take a very long time to clean it up.

(Continued,from page 3)

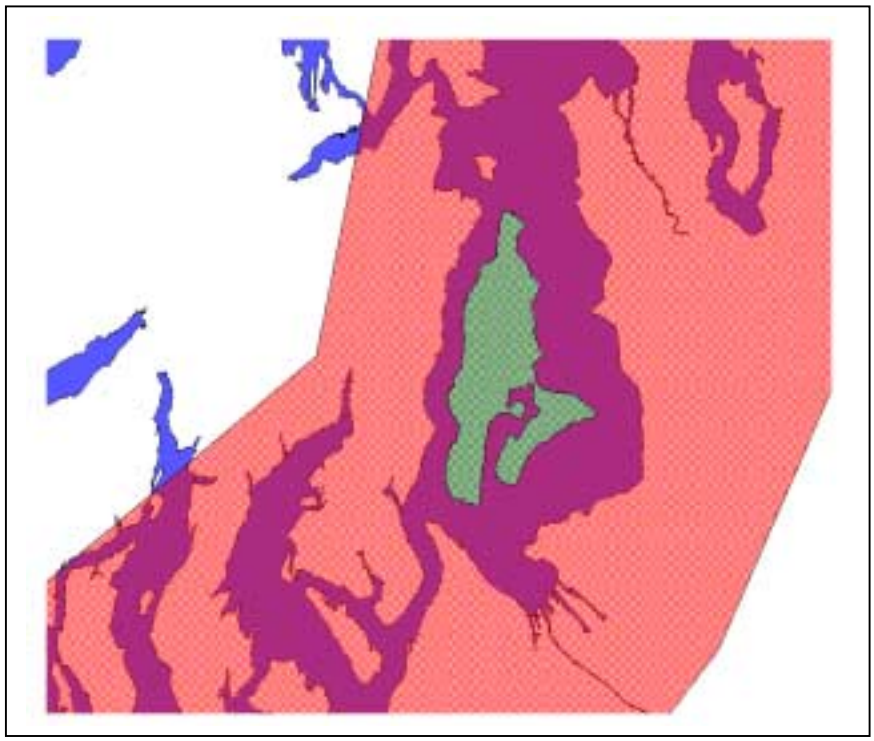
July, 2000:
PHSKC releases VMI Phase 1 report, information and maps available on website. $1.8 million grant to PHSKC announced for continuation of work on VMI and mainland. Focus on RI/FS begins.

July 27, 2000:
Public Meeting. Results and interpretatioons of Phase 1 study, Public Participation Plan announced, and preliminary plans for CUA sampling announced.

August, 2000:
Child use area sampling begins, lab protocols and data management system finalized.

October, 2000:
Mainland undisturbed sampling begins.

June, 2001
Agricultural survey near completion, CUA data validated, Public meeting scheduled for June 11 to discuss proposed Interim Action levels and next steps.



Vashon-Maury Island within the larger Smelter Plume "Footprint"