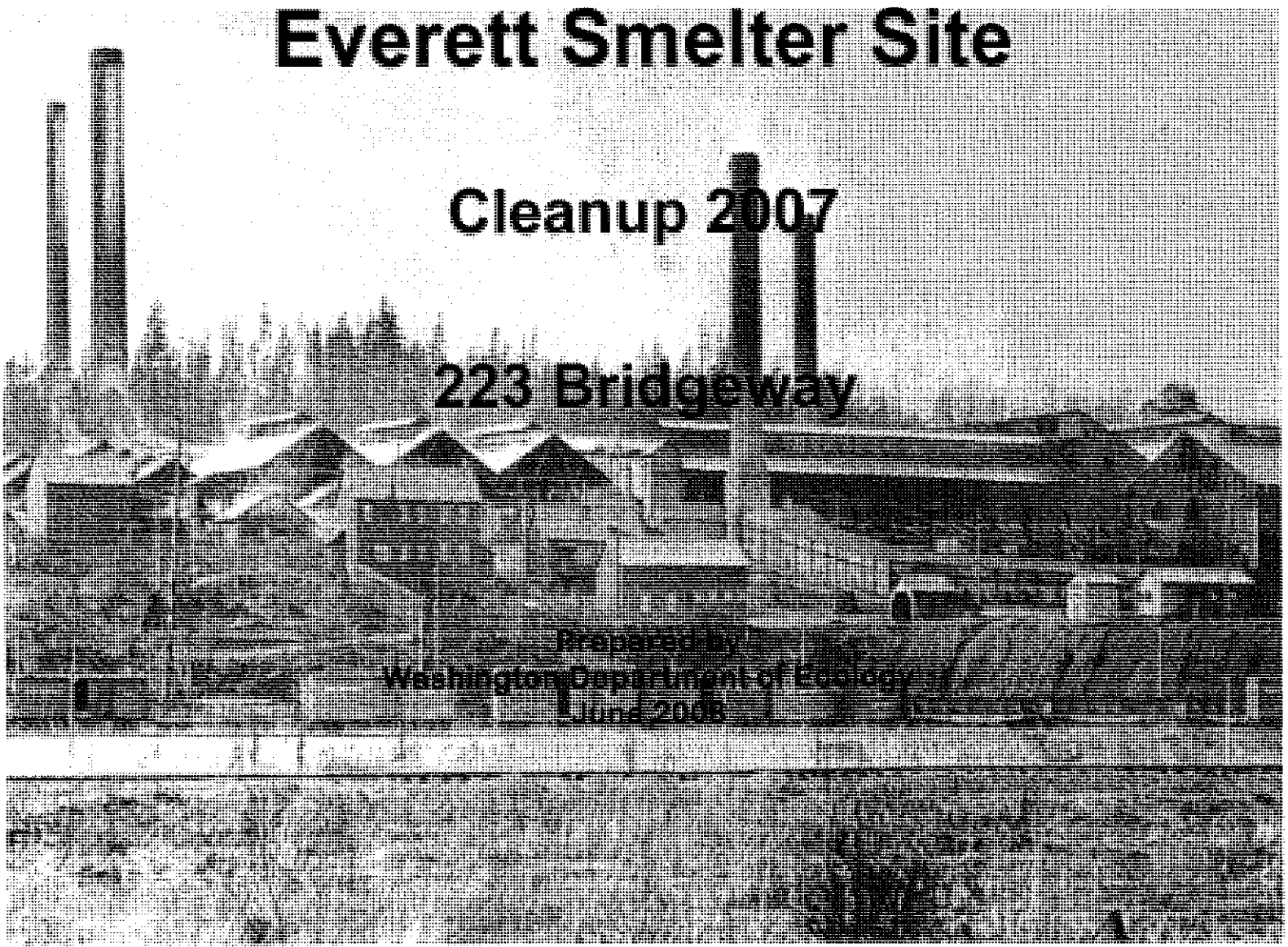
WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Everett Smelter Site

Cleanup 2007

223 Bridgeway



Prepared by
Washington Department of Ecology
June 2008

Professional Engineer's Statement
Everett Smelter Cleanup
June 16, 2008

Soil remediation was carried out at the following homes within the Everett Smelter Site during the period May 2007 to November 2007:

Address	Owner
229 Bridgeway	Arthur Guinn Shaffer
225 Bridgeway	Steffanie Campbell
223 Bridgeway	Godfrey and Ramona Holzinger
215 Bridgeway	Joshua & Michelle Allen
209 Bridgeway	Maria Paulay
207 Bridgeway	Paul D. King
205 Bridgeway	William C. MacPherson
201 Bridgeway	James and Kathleen Pankiewicz
115 Bridgeway	Mark & Lori Childress
109 Bridgeway	Bud E. Kast

Based on the results of testing and inspections, it is my opinion that the soil remediation carried out at these homes was performed in substantial compliance with the plans, specifications, and related documents governing the work

DAVID L. SOUTH
STATE OF WASHINGTON
22471
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 5/14/2009

Washington Department of Ecology
Everett Smelter Site
2007 Cleanup

Details of Cleanup Activities for 223 Bridgeway

In 2007, Department of Ecology (Ecology) selected 10 homes within the Everett Smelter Site for cleanup. These homes are located along the east side of Bridgeway in north Everett. Cleanup activities were conducted from May 21, 2007 – November 30, 2007. The cleanup was conducted according to the "Everett Smelter Site: Integrated Final Cleanup Action Plan and Final Environmental Impact Statement for the Upland Area" (see Document Repository information on page 6).

Where used for the first time, definitions for words marked in ***bold italics*** may be found in the definition section following this summary.

This report describes the cleanup actions that were conducted, where arsenic-contaminated soil was removed and where it remains for the following location:

Property Owner	Godfrey and Ramona Holzinger
Address:	223 Bridgeway Everett, WA 98201
Snohomish County State of Washington Tax Parcel No.	# 005203-000-045-00

Purpose of Sampling

The purpose of sampling was to determine the required depth of excavation for this property. The property was divided into three ***Decision Units*** A, B, and C, as shown on the attached map (see Attachment A). Attachment B graphically shows the sample results, and an explanation of the graphs is in Attachment C. A ***rotating laser level*** (see definition section) was used to measure the depth of the excavated soil in each decision unit.

The following is a summary of the work done to remediate the property within each of the decision units or other areas on the property.

DECISION UNIT A

Cleanup Activities

Results of pre-cleanup sampling indicated 18 inches of soil would have to be excavated in this decision unit. The on-site coordinator witnessed the soil being removed to a target depth of 18 inches.

Attachment B shows that:

- Below 18inches, the composite sample analyses are below the remediation levels of 60 ***parts per million (ppm)*** and 150 ppm.
- Below 18 inches, the soil contains arsenic above the cleanup level of 20 ppm; therefore, a ***geofabric*** marker was placed.

The decision unit was backfilled with clean material as described in the "Specifications for Everett Residential Soil Remediation" (see Document Repository information on page 6). Approximately 6 inches of clean topsoil was placed above the ***backfill***, and the surface was restored with sod unless specified otherwise.

Wooden Fence

The wood fence along the southeastern side of the property were removed to allow access and later reinstalled.

Storage Shed

The storage shed in front of the southern corner of the house was left in place and soil dug around it. The excavation was sloped approximately ***1:1*** away from the shed walls to protect the integrity of the structure. The concrete walkway between the storage shed and house was left in place and soil dug around it. If this storage shed is removed at any time in the future, suspected arsenic contaminated soil beneath this structure would be exposed.

An ***animal barrier*** was constructed around the perimeter of the shed as part of the site restoration work.

Along the circumference of the walls of the existing home, the excavation was sloped approximately 1:1 away from the foundation to protect the integrity of the house.

Maple Tree

At the request of the owner, the large maple tree located at the front yard was left in place. The drip line of the tree covers Decision Units A and C. Within the drip line of the tree, soil was removed from the top of the roots and covered with fabric. Beyond the drip line, soil was removed to a depth of 18 inches when possible. A dig depth of 18 inches was achieved at the north side of the decision unit (in the vicinity of sample A-3, A-4, and A-5), and the south side of the decision unit (in the vicinity of sample A-1).

The planned dig depth could not be achieved in root areas in order to insure the survival of the tree, an area northwest of sample A-6. After placing a geofabric marker, the decision unit was backfilled with clean material and topsoil as described in the "Specifications for Everett Residential Soil Remediation" (see Document Repository information on page 6). Contaminated soil remains underneath the geofabric and within the root ball zone of the tree left in place. Beneath the drip zone of the tree, the backfill and topsoil was finished with sod.

Steps and Surface for Future Driveway

The concrete steps leading down from street level to the front door were left in place and soil was dug around it. The excavation maintained a 1:1 slope around the concrete steps. Upon the request of the homeowner and the owner of the adjacent home at 215 Bridgeway, a compacted gravel surface in preparation for a driveway was prepared from street level to the space between these two homes in lieu of restoring the extension of two rock wall terraces at the front of 223 Bridgeway.

A ***French drain*** was installed at the end of the future driveway area to facilitate drainage with the restoration.

DECISION UNIT B

Cleanup Activities

Results of pre-cleanup sampling indicated 36 inches of soil would have to be excavated in this decision unit. Ecology on-site coordinator witnessed the soil being removed to a depth of 36 inches.

Attachment B shows that:

- Below 36 inches, results of discrete sample analyses are below the remediation level of 500 parts per million (ppm) for maximum arsenic concentrations.
- Below 36 inches, the soil contains arsenic above the cleanup level of 20 ppm; therefore, a geofabric marker was placed.

After placing a geofabric marker, the decision unit was backfilled with clean material as described in the "Specifications for Everett Residential Soil Remediation" (see Document Repository information on page 6). Specifications for Everett Residential Soil Remediation." Approximately 6 inches of clean topsoil was placed above the backfill, and the surface was restored with sod unless noted otherwise.

Chain Link Fence

The chain link fence along the northeastern side of the property were removed to allow access and later reinstalled.

Wood Deck

The wood deck at the northeast-facing wall of the house was left in place and soil dug around the deck. Potentially contaminated soil remains underneath this structure. An animal barrier was placed around the deck.

Septic Tank

An old septic tank in the backyard was encountered during cleanup. The tank was broken up in place and filled with clean backfill.

Hemlock Tree

Permission was granted by the City of Everett to remove a large hemlock tree from the city right-of-way just outside the southeast corner of the backyard. This tree had roots that intruded into the excavation area and its removal allowed for a more complete soil cleanup. During the tree removal it was discovered that the tree was diseased, rotten at the core, and likely to blow down in a wind storm.

DECISION UNIT C

Cleanup Activities

Results of pre-cleanup sampling indicated 24 inches of soil would have to be excavated in this decision unit. The on-site coordinator witnessed the soil being removed to a depth of 24 inches, except where noted in the following sections.

Attachment B shows that:

- Below 24 inches, the composite sample analyses are below the remediation levels of 150 parts per million (ppm).
- Below 24 inches, the soil contains arsenic above the cleanup level of 20 ppm; therefore, a geofabric marker was placed.

After placing a geofabric marker, the decision unit was backfilled with clean material as described in the "Specifications for Everett Residential Soil Remediation" (see Document Repository information on page 6).

Maple Tree

See description in Decision Unit A. North of the walkway in Decision Unit C, 24 inches of soil was removed. South of the walkway, numerous shallow tree roots were encountered which limited soil removal to 3-10 inches. This was accomplished by hand digging. In the vicinity of sample location C-5, tree roots were not encountered and 24 inches of soil was removed. In the area south of the walkway, the homeowner chose to have the area restored with beauty bark instead of sod.

Surface for Future Driveway

Part of the gravel driveway passes through the northwestern end of this decision unit. The concrete steps leading down from street level to the front door were left in place and soil was dug around it. The excavation maintained a 1:1 slope around the concrete steps. Upon the request of the homeowner and the owner of the adjacent home at 215 Bridgeway, a compacted gravel surface in preparation for a driveway was prepared from street level to the space between these two homes in lieu of restoring the extension of two rock wall terraces at the front of 223 Bridgeway.

Block Wall and Planter Boxes

Two block planter boxes were constructed along the north edge of the walkway leading from street level to the front door, as replacement for rock walls formerly in the vicinity of sample locations C-1 and C-3. The planter boxes were filled with topsoil and planted with junipers and dwarf rhododendrons. The rock wall at the southeastern end of this decision unit was replaced with block wall.

RESTORATION SUMMARY

- The rock wall at the southeastern end of Decision Unit C was replaced with block wall. The northern end of the rock wall was replaced with planter boxes constructed from blocks.
- Upon the request of the homeowner and the owner of the adjacent home at 215 Bridgeway, a compacted gravel surface for a future driveway was prepared from street level to the space between these two homes
- The large maple tree in the front yard was left in place and soil was dug above the root ball according to the "Specifications for Everett Residential Soil Remediation" (see Document Repository information on page 6).
- An old septic tank in the backyard was encountered during cleanup. The tank was broken up in place and filled with clean backfill.

MATERIAL QUANTITIES

Quantity of contaminated soil removed:	390.17 Tons
Quantity of clean backfill used:	197.5 Cubic Yards
Quantity of clean topsoil used:	66 Cubic Yards

Jerome Cruz
Washington Department of Ecology
3190 160th Ave SE

January 31, 2008

223 Bridgeway
Everett, WA 98201

Bellevue, WA 98008

Attachments: A. Site Map
B. Graphs of Arsenic Concentration vs. Depth
C. Explanation of graphs

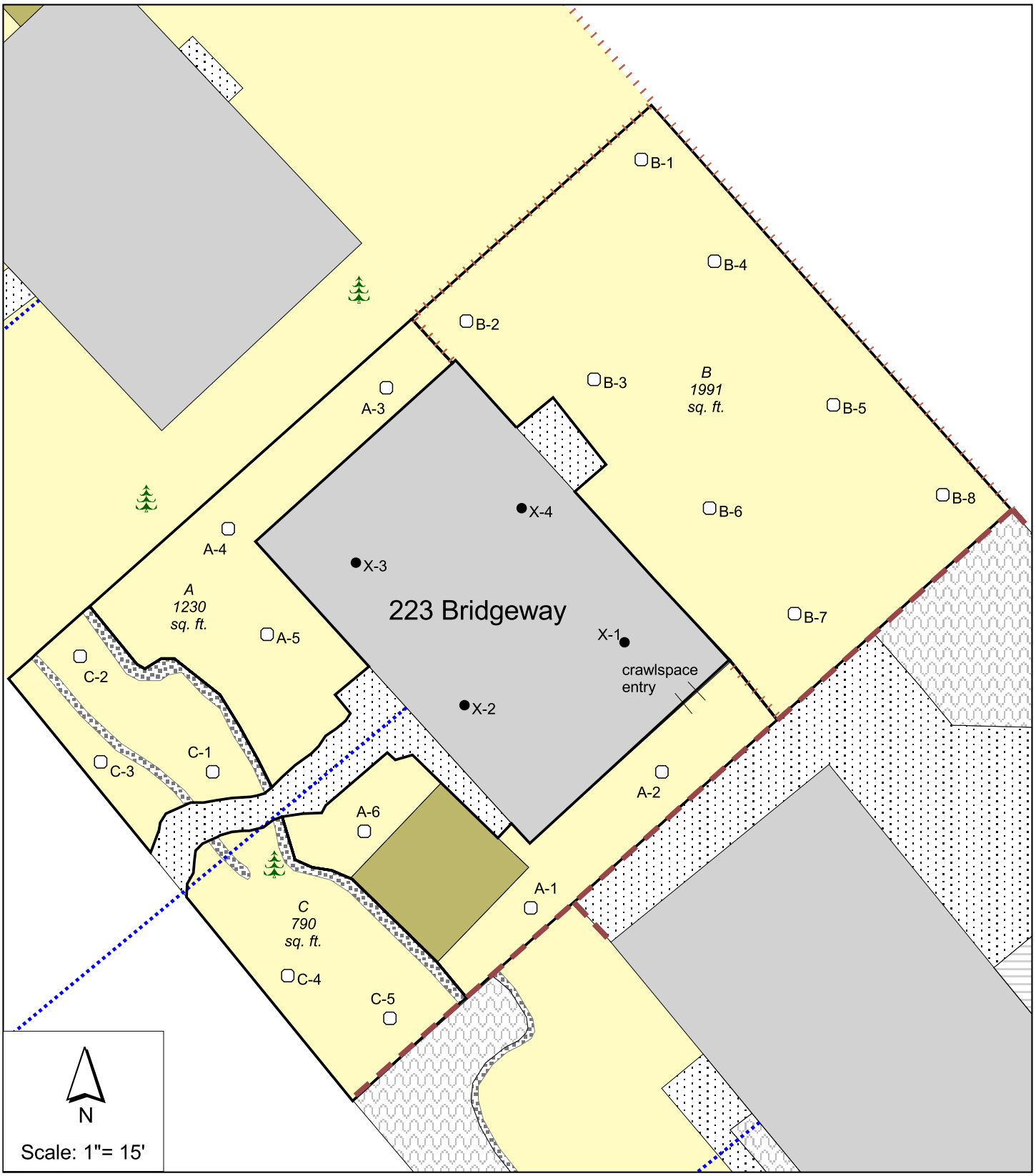
Note:

If the attachments listed above do not accompany this document, copies may be obtained from Ecology. Please contact Central Records at Ecology's Northwest Regional Office (NWRO) at (425) 649-7190 for information on obtaining copies.

Document Repository
These following documents can also be found at NWRO:

- Integrated Final Cleanup Action Plan
- Final Environmental Impact Statement for the Upland Area
- Specifications for Everett Residential Soil Remediation

cc: City of Everett Public Works
Ecology Central Files, Northwest Regional Office
Ecology Contract Officer, Headquarters
Ecology, Office of the Attorney General
Ecology On-site Coordinator, SAIC
Everett Public Library
Northeast Everett Community Organization
Northwest Everett Neighborhood Association
Snohomish PUD
Wyser Construction, Inc.



LEGEND

- Decision Unit Samples
- Crawlspace Samples

223 Bridgeway (Home 53)

Everett Smelter Homesite Cleanup

Source: Snohomish Health District