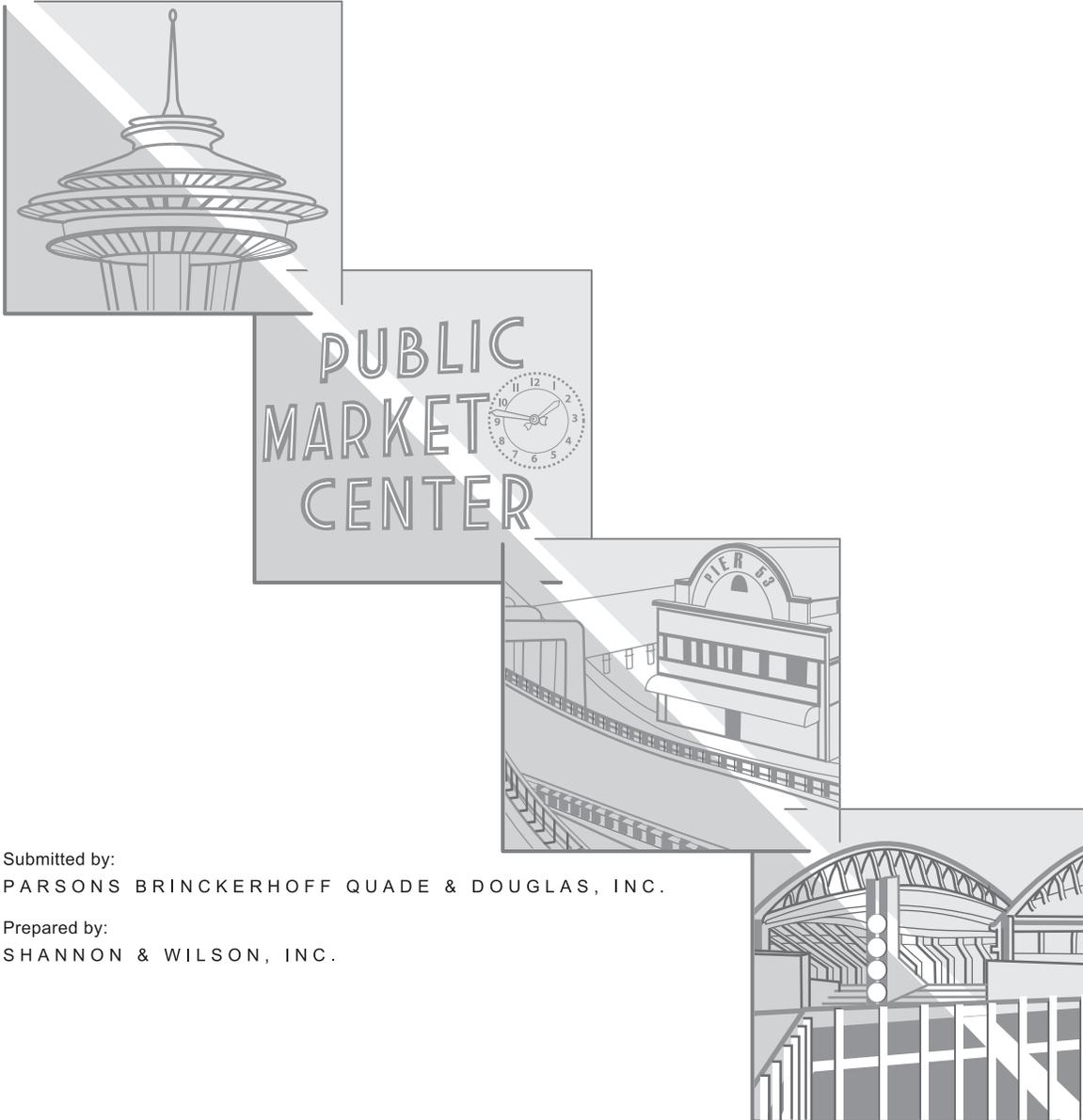


# SR 99: ALASKAN WAY VIADUCT & SEAWALL REPLACEMENT PROJECT

Supplemental Draft Environmental Impact Statement

## APPENDIX U

Hazardous Materials Discipline Report



Submitted by:  
PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.

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SHANNON & WILSON, INC.

JULY 2006



# SR 99: ALASKAN WAY VIADUCT & SEAWALL REPLACEMENT PROJECT

## Supplemental Draft EIS Hazardous Materials Discipline Report

AGREEMENT NO. Y-7888

FHWA-WA-EIS-04-01-DS

Submitted to:

**Washington State Department of Transportation**

Alaskan Way Viaduct and Seawall Replacement Project Office

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Seattle, WA 98104

The SR 99: Alaskan Way Viaduct & Seawall Replacement Project is a joint effort between the Washington State Department of Transportation (WSDOT), the City of Seattle, and the Federal Highway Administration (FHWA). To conduct this project, WSDOT contracted with:

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BJT Associates

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- ATTACHMENT A Sites Excluded Based on Screening Criteria
- ATTACHMENT B Sites with Documented and Potential Contaminant Releases

## ACRONYMS

CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cy	cubic yard
Ecology	Washington State Department of Ecology
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
GPR	ground penetrating radar
H <sub>2</sub> S	hydrogen sulfide
kg	kilogram
L	liter
mg	milligram
MSE	mechanically stabilized earth
MTCA	Model Toxics Control Act
NEPA	National Environmental Policy Act
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	tetrachloroethylene
ppb	parts per billion
ppm	parts per million
PSI	preliminary site investigation
SR	State Route
TCE	trichloroethylene
UST	underground storage tank
WSDOT	Washington State Department of Transportation

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## PREFACE

The technical appendices present the detailed analyses of existing conditions and predicted effects of each alternative. The results of these analyses are summarized and presented in the main text of the Supplemental Draft Environmental Impact Statement (EIS).

The Supplemental Draft EIS appendices are intended to add new information and updated analyses to those provided in the Draft EIS, published in March 2004. Information that has not changed since then is not repeated in these appendices. Therefore, to get a complete understanding of the project area conditions and projected effects, you may wish to refer to the appendices that were published with the Draft EIS. These are included on a CD in the Supplemental Draft EIS. To make it easier to understand where there is new information or analyses, the supplemental appendices present information in the same order as it was presented in the Draft EIS appendices.

The Supplemental Draft EIS and the technical appendices evaluate the effects of three construction plans: the shorter plan, the intermediate plan, and the longer plan. These plans vary in how long SR 99 would be completely closed, in how long the periodic closures may be, and in the total construction duration. For the purposes of the analyses in the technical appendices, two construction plans are evaluated with the Tunnel Alternative and one plan is evaluated with the Elevated Structure Alternative. However, each alternative could be built with any of the three plans. The construction durations and the sequencing would not be the same for a particular construction plan if paired with a different alternative; however, the effects would be within the ranges presented by the analyses.

There are several differences in how the information is presented between the main text of the Supplemental Draft EIS and how it is presented in these appendices. The Supplemental Draft EIS text refers to possible variations within the alternatives as “choices” while these appendices use the term “options.” (For example, Reconfigured Whatcom Railyard versus Relocated Whatcom Railyard is referred to as a design choice in the Supplemental Draft EIS and as an option in the appendices.) In either case, the intent is to describe the various configurations that could be selected and the effects for each design.

One design choice in particular is handled very differently between the Supplemental Draft EIS text and the technical appendices. For the Tunnel Alternative in the central waterfront area, there is a choice between a stacked tunnel alignment and a side-by-side tunnel alignment. In the appendices, to simplify the discussion, these two alignments, as well as the Elevated Structure

Alternative, are each paired with a different set of options throughout the corridor and presented as complete sets that are evaluated separately. The Supplemental Draft EIS text communicates this information differently by describing one Tunnel Alternative and one Elevated Structure Alternative and evaluating the effects of the different design choices (or mix-and-match components) separately. While it may appear that there are three alternatives analyzed in the appendices and two in the Supplemental Draft EIS text, there are in fact only two alternatives. Each alternative has many potential components or design choices that can be made throughout the corridor.

The organization of the analysis of the alternatives is also a little different between the main body of the Supplemental Draft EIS and the appendices. In the Supplemental Draft EIS text, we identify two alternatives: a Tunnel Alternative and an Elevated Structure Alternative. The Supplemental Draft EIS text compares these alternatives directly by comparing effects (for example, the effects of both alternatives on water quality are presented together). The appendices present the effects of each alternative separately (for example, all of the effects of the Tunnel Alternative are presented first, followed by all of the effects of the Elevated Structure Alternative). The substance of both discussions is the same. The organization of the Supplemental Draft EIS technical appendices mirrors that of the Draft EIS appendices, allowing you to more easily find comparable information in the Draft EIS appendices.

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## Chapter 1 SUMMARY

The Alaskan Way Viaduct and Seawall Replacement Project Draft Environmental Impact Statement (EIS) (WSDOT et al. 2004) evaluated the construction and operation of five Build Alternatives as well as a No Build Alternative. In December 2004, the lead agencies narrowed the five alternatives down to two—Tunnel and Rebuild. They identified the Tunnel Alternative as the Preferred Alternative and carried the Rebuild Alternative forward for analysis as well. Since that time, engineering and design has been updated and refined for the Tunnel and Rebuild Alternatives. Due to the magnitude of the changes in the design of the Rebuild Alternative, it has been renamed the Elevated Structure Alternative. The Elevated Structure Alternative combines elements of the Aerial and Rebuild Alternatives that were evaluated in the Draft EIS.

This supplemental discipline report for hazardous materials addresses changes related to the updated Tunnel Alternative (Preferred Alternative) and the Elevated Structure Alternative only. A full discussion of impacts and mitigation for the five Build Alternatives and the No Build Alternative was presented in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Shannon & Wilson, Inc. 2004), which can be referenced for original text, tables, and exhibits relating to hazardous materials.

The updated Tunnel and Elevated Structure Alternatives differ slightly in their alignments and options when compared to the alternatives presented in the Draft EIS. Some options previously being considered are no longer included in the updated alternatives, and new options have been developed. There are many changes in the updated Tunnel and Elevated Structure Alternatives that do not substantially affect the impacts related to hazardous materials. The primary changes that affect hazardous materials are described below.

The Tunnel Alternative includes two “alignments,” the term used to refer to either of the proposed tunnel configurations being evaluated in this Supplemental Draft EIS. The stacked tunnel alignment would replace the viaduct with a double-level tunnel, whereas the side-by-side tunnel alignment would replace the viaduct with traffic lanes side-by-side in a tunnel. The Elevated Structure Alternative has only one proposed alignment.

Each alternative has many potential components or choices that can be made throughout the corridor which are referred to as “options” in this report. The options are project features that are intended to provide some choices that can be mixed and matched with the proposed Build Alternatives. Exhibit 1-1

shows the options that have been evaluated with the Tunnel and Elevated Structure Alternatives. For ease of presentation and analysis, each alternative is described with a specific set of options in this report.

**Exhibit 1-1. Tunnel and Elevated Structure Alternatives with Options**

Options <sup>1</sup>	Tunnel Alternative	Elevated Structure Alternative
<b>South Section</b>		
Reconfigured Whatcom Railyard	yes	yes
Relocated Whatcom Railyard	yes	yes
<b>Central Section</b>		
Steinbrueck Park Lid	yes	no
Steinbrueck Park Walkway	yes	no
SR 99 Over Elliott and Western Avenues	yes	yes
SR 99 Under Elliott and Western Avenues	yes	no
<b>North Section</b>		
Battery Street Tunnel Curves Widened	yes	no <sup>2</sup>
Battery Street Tunnel Curves Not Widened	yes	yes
Partially Lowered Aurora	yes	yes
Lowered Aurora	yes	no <sup>2</sup>

<sup>1</sup> These mix-and-match features are referred to as “choices” in the Supplemental Draft EIS text.

<sup>2</sup> These options could be included with the Elevated Structure Alternative; however, they were not evaluated with this alternative in the technical appendices. See the Preface (page v) for an explanation of differences in the combinations of alternatives and mix-and-match features (choices or options) evaluated in the Supplemental Draft EIS and the technical appendices.

In the south, two options are being considered for both the Tunnel and Elevated Structure Alternatives where State Route (SR) 99 crosses the Whatcom Railyard’s lead track. Both of the options would affect railroad properties.

- The Reconfigured Whatcom Railyard Option would retain the existing SR 99 in its current alignment between the Burlington Northern Santa Fe Railway Company (BNSF) Seattle International Gateway (SIG) Railyard on the east and the Whatcom Railyard to the west. A short bridge would carry SR 99 over the new tail track and connection between the railyards.
- The Relocated Whatcom Railyard Option would place SR 99 at-grade adjacent to E. Marginal Way and relocate the tracks to the east.

In the central section, two options are being considered for the Tunnel Alternative at Elliott and Western Avenues:

- SR 99 would pass Under Elliott and Western Avenues. This option includes the construction of a large cut on the slope below the existing viaduct.
- SR 99 would extend Over Elliott and Western Avenues.

In the central waterfront section, the Elevated Structure Alternative would be wider than the Rebuild Alternative evaluated in the Draft EIS, but not quite as wide as the Aerial Alternative. The Elevated Structure Alternative does not include the option to go under Elliott and Western Avenues.

The alternatives in the Draft EIS had considered a fire and life safety upgrade of the Battery Street Tunnel only. The updated Tunnel and Elevated Structure Alternatives include lowering the tunnel floor to provide 16.5 feet of vertical clearance for the entire length of the Battery Street Tunnel. The revised project alignments north of the Battery Street Tunnel now extend the northern limit to about Comstock Street. The Partially Lowered Aurora improvements (paired with the preferred stacked tunnel alignment and the Elevated Structure Alternative) would extend up to Aloha Street. Improvements for the Lowered Aurora Option under the Tunnel Alternative would extend to about Comstock Street.

Impacts and mitigations presented in the March 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report, are applicable to the updated alternatives with the addition of what is included in this supplemental report.

Two more potentially contaminated sites would be acquired for the preferred stacked tunnel alignment compared to the Elevated Structure Alternative. If the Whatcom Railyard were relocated rather than reconfigured, up to 18 additional potentially contaminated sites would be affected. In addition, several other properties that do not have any current or historical land use indicating the use of hazardous materials would be acquired for both alternatives.

The reconfiguration and extension of the alignment to either Aloha or Comstock Street increases the volume of potentially contaminated material that would be excavated. The alignment crosses potentially high-risk sites, and dangerous waste could be encountered.

For the stacked tunnel alignment, approximately 2,567,000 cubic yards (cy) would be excavated. Of that material, approximately 1,866,000 cy could be potentially contaminated. For the side-by-side tunnel alignment,

approximately 3,316,000 cy of material would be excavated. Of that material, approximately 2,532,000 cy could potentially be contaminated.

The Elevated Structure Alternative with the Reconfigured Whatcom Railyard Option would result in the smallest quantity of soil that would be removed for the project. Approximately 1,313,000 cy would be excavated. Of that material, 1,111,000 cy could be potentially contaminated. If Whatcom Railyard were relocated, approximately 1,407,000 cy would be excavated. Of that material, 1,205,000 cy could be potentially contaminated.

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## Chapter 2 METHODOLOGY

The methodology is the same as described in Chapter 2 of the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report.

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## Chapter 3 STUDIES AND COORDINATION

This section presents a summary of the studies that were undertaken to identify potentially hazardous materials that may be present within the project corridor.

### 3.1 Historical Records Reviewed

The historical records reviewed section is the same as the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 3.1). Historical review was limited to the project corridor (proposed alternative alignments and adjacent areas within approximately 400 feet, or two city blocks).

### 3.2 Regulatory Records Review

The regulatory records reviewed section is the same as the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 3.2).

### 3.3 Site Screening Criteria and Evaluation Criteria

#### 3.3.1 Listed Sites with Documented, Suspected, or Potential Releases

Databases were searched for sites within a distance of 1.0 mile from the project corridor boundary to encompass all potential alignments during the preliminary design phase of this project (EDR 2001, which was included as Attachment A of Appendix U in the Draft EIS). Changes in sites with documented, suspected, or potential releases because of the change in the corridor boundaries are presented in Attachment A. No additional sites with known contamination were identified within the revised corridor (EDR 2001).

#### 3.3.2 Historical Releases

A list of the historical businesses and industries within the project area that are likely to have been associated with generation, storage, or transportation of hazardous materials was developed based on a review of historical records (see Section 3.1). Exhibit 3-1 includes a list of the identified industries and associated contaminants that were considered as having the potential for a historic release. Although many contaminants may have been used at sites, the most likely contaminant that would be encountered at each business type has been identified.

### Exhibit 3-1. Types of Businesses and Likely Contaminants

Business	Likely Contaminants
Asphalt paving	<i>Petroleum</i> , others
Auto service	<i>Petroleum</i> , solvents, metals
Auto washing	<i>Petroleum</i>
Auto wrecking/junk yard	<i>Petroleum</i> , metals
Batteries	<i>Metals</i> , other
Blacksmiths	<i>Metals</i>
Electric substations and transformers	<i>PCBs</i>
Cleaners/laundry	<i>Solvents</i>
Coal storage/bunkers	<i>Petroleum</i> , others
Dyers	<i>Solvents</i> , metals
Foundry	<i>Metals</i> , solvents, petroleum, PCBs
Gas station	<i>Petroleum</i>
Gas station with auto service	<i>Petroleum</i> , solvents, metals
Hat cleaners	<i>Solvents</i>
Laundry/laundromat only	<i>Solvents</i>
Lithographers	<i>Solvents</i> , metals
Machinists	<i>Metals</i> , solvents, petroleum, PCBs
Manufacturing chemists	<i>Solvents</i> , petroleum
Metal plating	<i>Metals</i> , solvents, petroleum, PCBs
Oil burner repair/sales	<i>Petroleum</i>
Painters	<i>Solvents</i> , metals
Photo finishers	<i>Solvents</i> , metals
Plastic fabricators	<i>Solvents</i>
Printers	<i>Solvents</i> , metals
Railroads	<i>Petroleum</i> , solvents, paint, fungicides, insecticides
Saw mill	<i>Petroleum</i>
Sheet metal works	<i>Metals</i> , solvents, petroleum, PCBs
Stockyards	<i>Insecticides</i> , fungicides
Trunk manufacturers	<i>Solvents</i> , metals
Upholstery cleaners	<i>Solvents</i>
Welding	<i>Metals</i> , solvents

*Bold/Italic* text = Predominant contaminant, most likely to pose a problem.

PCBs = polychlorinated biphenyls

In reviewing archive files, sites with heating oil tanks were also identified. These tanks are not required to be registered and do not appear in the state underground storage tank (UST) databases. Sites where the only potential source of contamination is a known or suspected heating oil UST were eliminated from further evaluation because of their typically smaller volume

and the low mobility of heating oil. Changes to “Oil Heat Only” sites are listed in Exhibit A-3, Attachment A.

### 3.4 Validated Sites

The site screening resulted in the identification of a list of validated sites that pose some risk to the project. This list consists of listed sites (that were not eliminated) and sites identified through review of historical information. The two lists were reconciled to avoid listing a site for both a known release (listed site) and potential release based on historic business activities. A determination was then made as to whether remediation approaches for the site would be “reasonably predictable” or the site is considered “substantially contaminated,” as defined by the Federal Highway Administration (FHWA) (WSDOT 2005). Sites are discussed and presented in Chapter 4, Affected Environment, and are summarized in Exhibit B-1, Attachment B.

Reasonably predictable sites are those where the nature of potential contamination is known based on existing data, or where it can be reasonably predicted based on observations of the site, experience at similar sites, and/or best engineering judgment. Reasonably predictable sites are typically small to medium in size, contain potential contaminants that are not extremely toxic or difficult to treat, and dictate straightforward approaches to remediation. Examples of sites that are classified as reasonably predictable are gas stations, automobile repair shops, most USTs, leaking USTs (LUSTs), aboveground storage tanks, small manufacturing operations, and buildings with asbestos and/or materials containing lead paint.

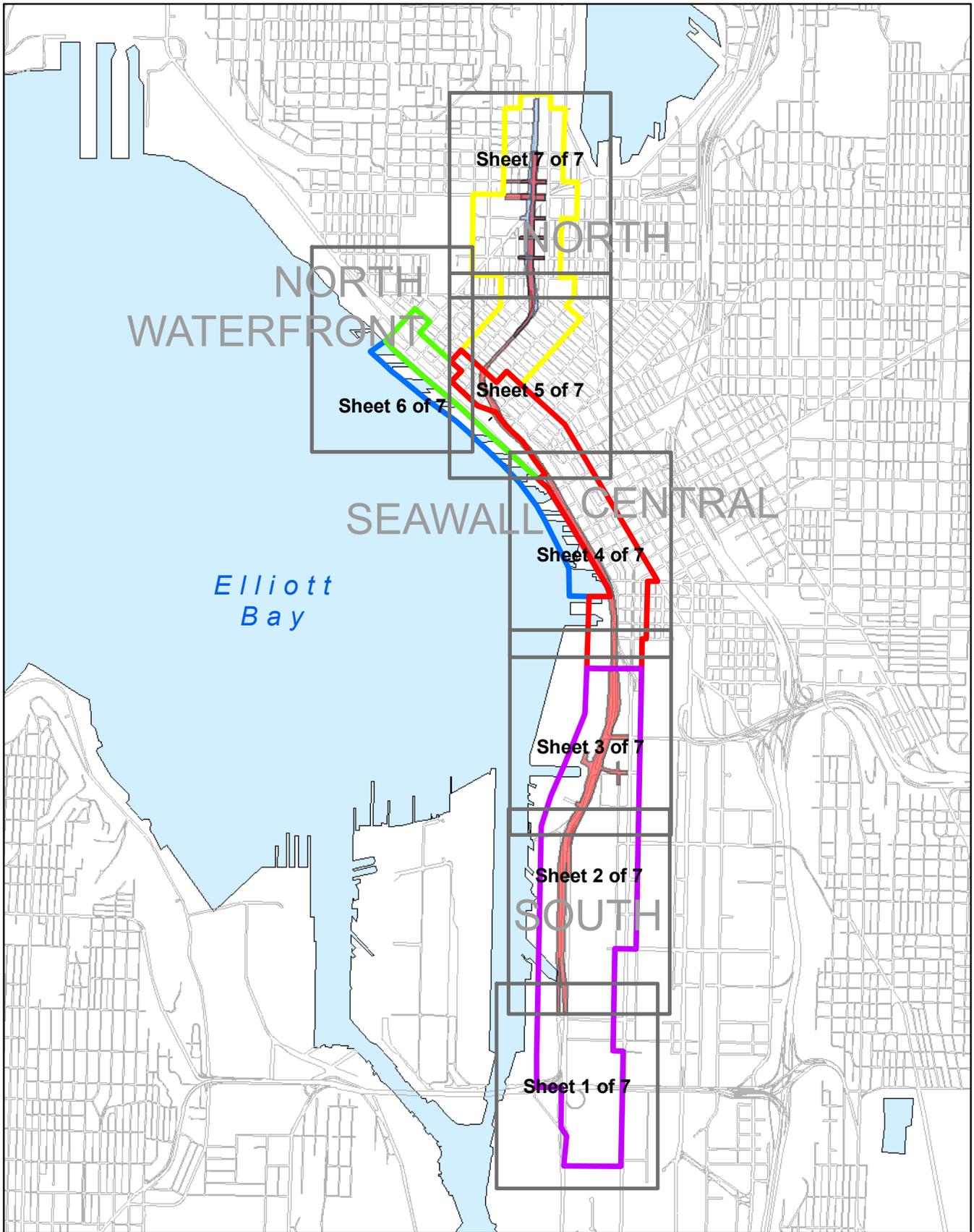
Substantially contaminated sites may pose a potential for major liability for Washington State Department of Transportation (WSDOT) either in construction liability or by virtue of acquiring all or a part of the site. If the site has undergone a detailed investigation and a feasibility study, the impacts and remediation costs may have been predicted. Nonetheless, the site is identified as substantially contaminated because of its potential impact to the project. Other sites are considered substantially contaminated sites because their impacts are not reasonably predictable. In general, substantially contaminated sites possess a potential for substantial soil, water, and/or sediment contamination, and/or the information necessary to predict remedial costs is lacking, and/or the contaminants are persistent and/or expensive to manage. The site may be contaminated over a large area with a single contaminant or over a smaller area with multiple contaminants. Substantially contaminated sites are typically large and/or have large volumes of contaminated material, and/or have a long history of industrial or commercial use. Examples of sites that would be classified as substantially contaminated

include wood treating operations, metal plating facilities, large bulk petroleum facilities, refineries, hazardous material treatment facilities, or other sites that use or have used large amounts of contaminating materials (WSDOT 2005).

Substantially contaminated and reasonably predictable terminology are used to distinguish properties that should be sampled prior to completing National Environmental Policy Act (NEPA) documentation. Properties that are substantially contaminated pose an increased risk of encountering costly, unanticipated contamination and should be sampled early. Properties that are reasonably predictable can be sampled after NEPA documentation is completed and before property acquisition or construction.

### 3.5 Subsurface Explorations Conducted for the EIS

In addition to the environmental sampling conducted in 2002 for preliminary design and the EIS, additional borings were drilled in the central and south areas and in the area north of the Battery Street Tunnel in 2004 and 2005. These borings were drilled to support continuing design of the Alaskan Way Viaduct. Selected soil and groundwater samples were analyzed to identify contaminants that may affect disposal or treatment of the respective media. The results are discussed in Chapter 4. Summaries of soil and groundwater analytical testing results, along with complete analytical laboratory reports, are provided in the *Geotechnical and Environmental Data Report* (Shannon & Wilson, Inc. 2005a) and the *Geotechnical and Environmental Data Report - North of the Battery Street Tunnel* (Shannon & Wilson, Inc. 2005b). Exhibit 3-2 includes the explorations drilled in 2004 and 2005.



# LEGEND

-  **Tunnel Alternative-  
stacked tunnel alignment  
(preferred alignment)  
Elevated Structure Alternative**
-  **Lowered Aurora Avenue Option  
Tunnel Alternative (side-by-side tunnel alignment)**

 **Fill**

 **Historic Railroad Use**

 **Block w/Designation**

## Corridor Zones

 Central

 North

 North Waterfront

 Seawall

 South

## Outfalls

 Combined Sewer Outfall

 Sewer Drain Outfall

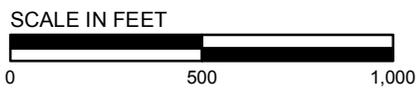
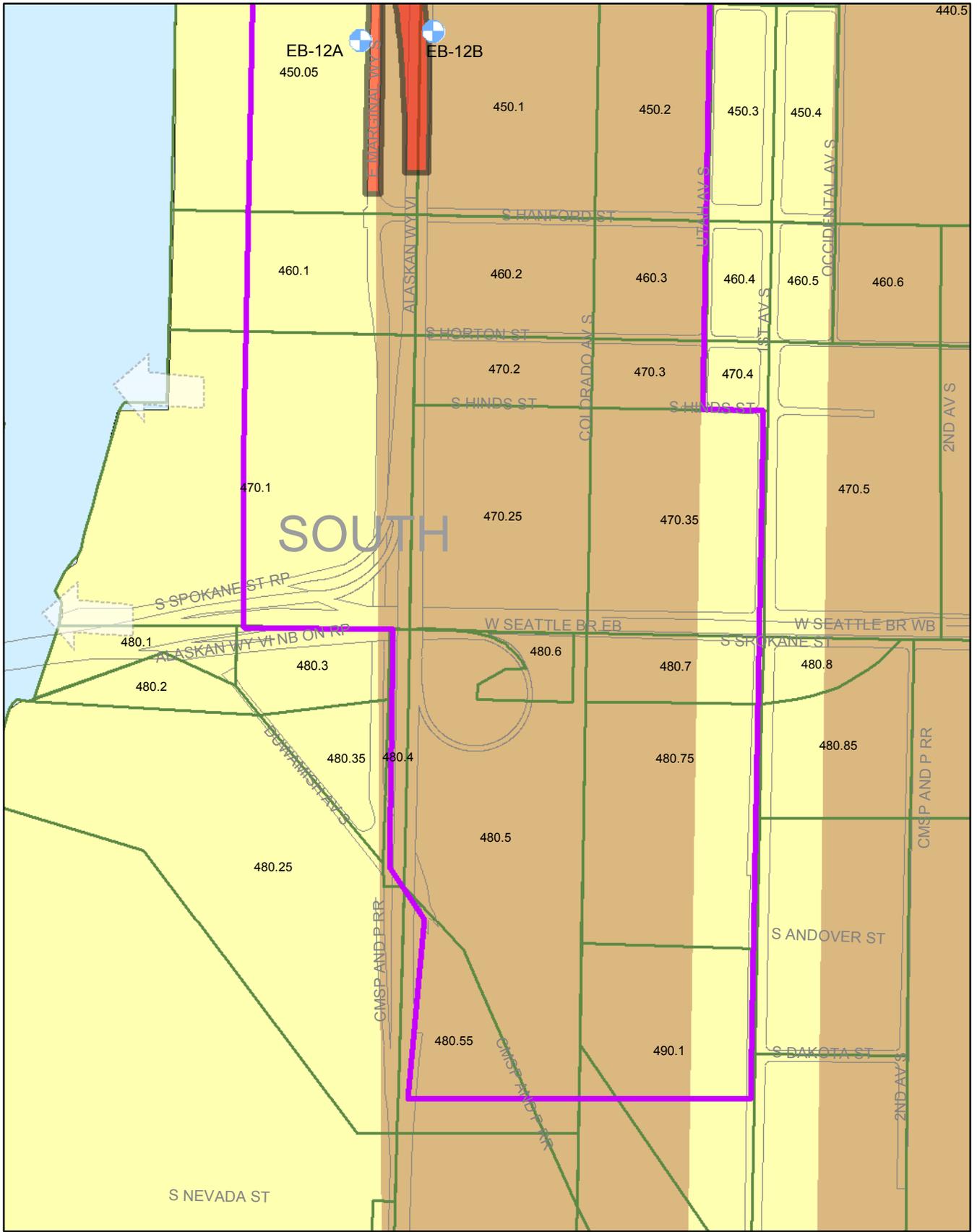
## Borings

 **Shannon & Wilson Borings (Pre 2004)**

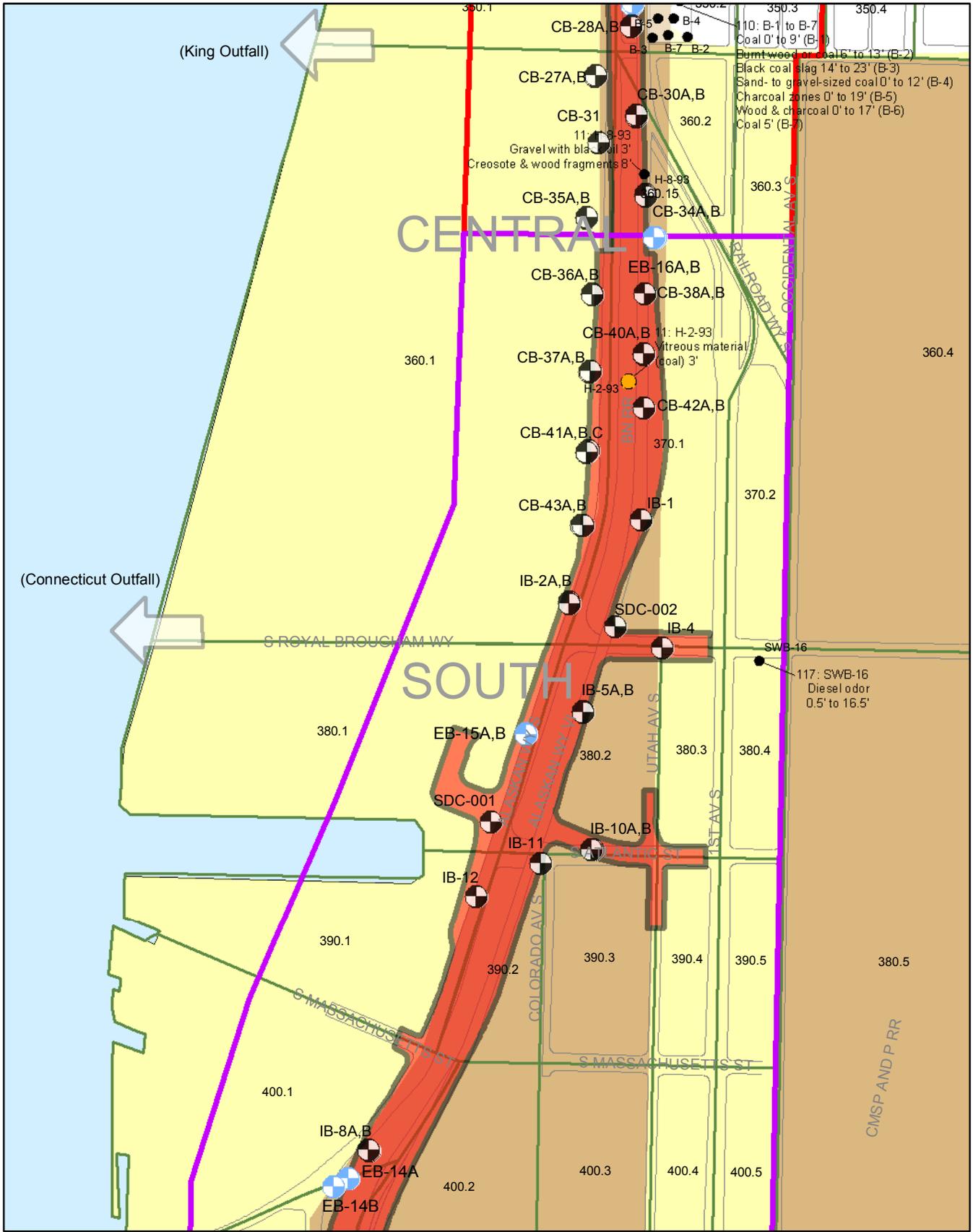
 **Shannon & Wilson Borings (2004-Present)**

### Research Borings

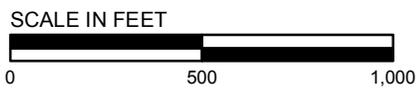
-  0 - 50 (depth in feet)
-  51 - 100 (depth in feet)
-  101 - 150 (depth in feet)





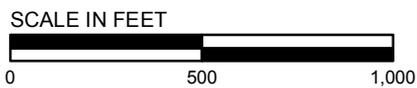


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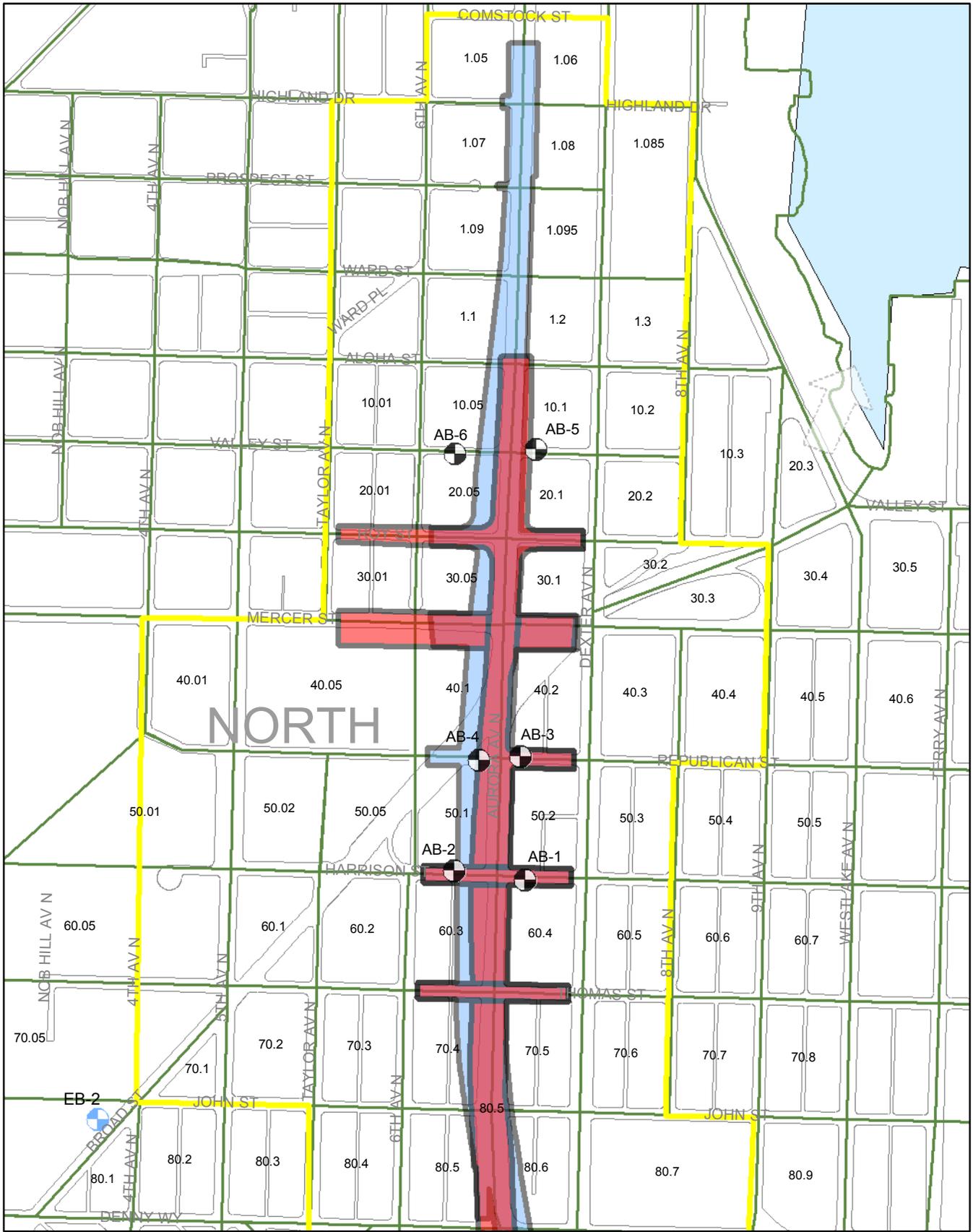


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SCALE IN FEET



**Exhibit 3-2**  
**Explorations**  
*Sheet 7 of 7*

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## Chapter 4 AFFECTED ENVIRONMENT

The Alaskan Way Viaduct and Seawall Replacement Project Corridor boundaries generally follow the SR 99 alignment from approximately S. Spokane Street in the south to Comstock Street to the north of the Battery Street Tunnel. The alignment has been modified and includes additional properties. Boundaries between the areas have also shifted. Some properties have been deleted because they are no longer within the project corridor.

The project areas discussed in this chapter, as shown in Exhibit 4-1, from south to north, are as follows:

- South – S. Spokane Street to S. Dearborn Street
- Central – S. Dearborn Street to the Battery Street Tunnel
- North Waterfront – Pine Street to Broad Street
- North – Battery Street Tunnel to Comstock Street
- Seawall – S. Washington Street to Broad Street

The method for assessing the risk associated with each validated property is the same as in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report, as described below; however, the risks posed for the following properties have changed because of revisions to the proposed alignment or because a property would potentially be acquired or modified.

Each validated property described below is located adjacent to the proposed alignment or is a property that would potentially be acquired or modified. Because of their proximity to the alignments, these properties have a higher potential to affect the project than sites located farther from the alignments. The potential risk to the project for each of these properties was characterized as low, moderate, or high depending on whether contamination was known to be present, if remediation of suspected contaminants is reasonably predictable, and/or whether earthwork is anticipated in the property vicinity or the site would be acquired for the project.

Low-risk properties include sites where remediation of contamination, if present, would be reasonably predictable.

Moderate-risk properties include (1) sites that are classified as substantially contaminated under FHWA guidelines, but WSDOT is not anticipated to acquire the property and/or contamination is only suspected, and (2) sites classified as reasonably predictable that WSDOT is anticipating would be acquired or modified.

High-risk properties include sites classified as substantially contaminated under FHWA guidelines that WSDOT is anticipated to acquire or on which earthwork would occur.

Each block within the corridor was assigned a number, from north to south. Block boundaries were established based on the original city plat maps; consequently, block boundaries presented in Exhibit 4-1 may differ slightly from current block boundaries. The area south of S. Royal Brougham Way has had the greatest changes in block configurations. The site number consists of one or more parcels depending upon the business. In some instances, individual parcels have been sold and may have subsequently been used for a different type of business. Site numbers would then overlap.

Site-specific information shown in Exhibit 4-1 is also presented in Attachment B, Exhibit B-1. Exhibit 4-1 has been revised to show the Tunnel Alternative (both the preferred stacked tunnel alignment and the optional side-by-side tunnel alignment) and the Elevated Structure Alternative.

## 4.1 Historical Land Use

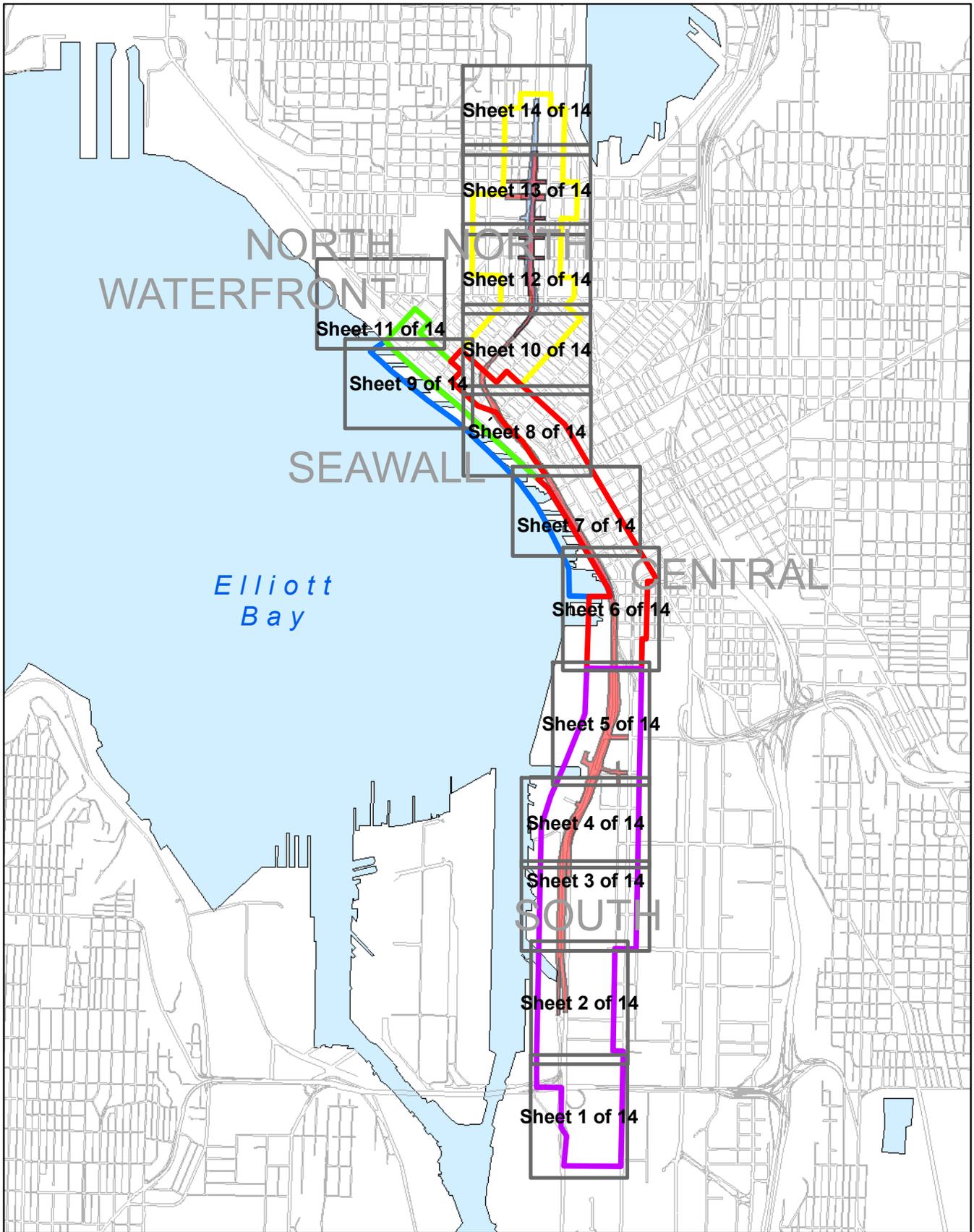
No additional land use research was conducted for the Supplemental Draft EIS. The following sections discuss changes and additions to the validated properties and non-validated properties of concern for each section of the project area.

### 4.1.1 South – S. Spokane Street to S. Dearborn Street

The historical land use is the same as in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 4.1.1).

#### Validated Properties

**Blocks 390.5, 460.3, 470.1, 470.2, 470.25, 470.3, 470.35, 480.5, 480.55, 480.6, 480.7, and 480.75** have been removed from this section because they are no longer adjacent to the proposed alignment and/or the properties would no longer be acquired or modified.



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**Exhibit 4-1**  
**Sheet Index for Sites**  
**with Documented and Potential**  
**Contaminant Releases**  
*Sheet A*

# LEGEND

(See Exhibit C-1 for a summary of each site)

## Hazardous Materials



**Documented Releases**

### Gasoline

Reasonably Predictable

Substantially Contaminated

### Solvents

Reasonably Predictable

Substantially Contaminated

### Petroleum (diesel and/or oil)

Reasonably Predictable

Substantially Contaminated

### Metals

Reasonably Predictable

Substantially Contaminated

### PCBs

Reasonably Predictable

Substantially Contaminated

### Combination

Metals and PCBs

Petroleum and Gas

PCBs and Petroleum

Petroleum and Metals

Metals, PCBs, and Petroleum

### Combination cont...

Solvents and Metals

Solvents, Metals, Gas, and Petroleum

Solvents, Metals, Petroleum, and PCBs

Solvents and Gas

Solvents, Metals, and Gas

Solvents, Metals, and Petroleum



**Tunnel Alternative-  
stacked tunnel alignment  
(preferred alignment)  
Elevated Structure Alternative**



**Lowered Aurora Avenue Option  
Tunnel Alternative (side-by-side  
tunnel alignment)**

**Fill**

**Historic Railroad Use**

**Parcel w/Site Designation**

**Block w/Designation**

### Corridor Zones

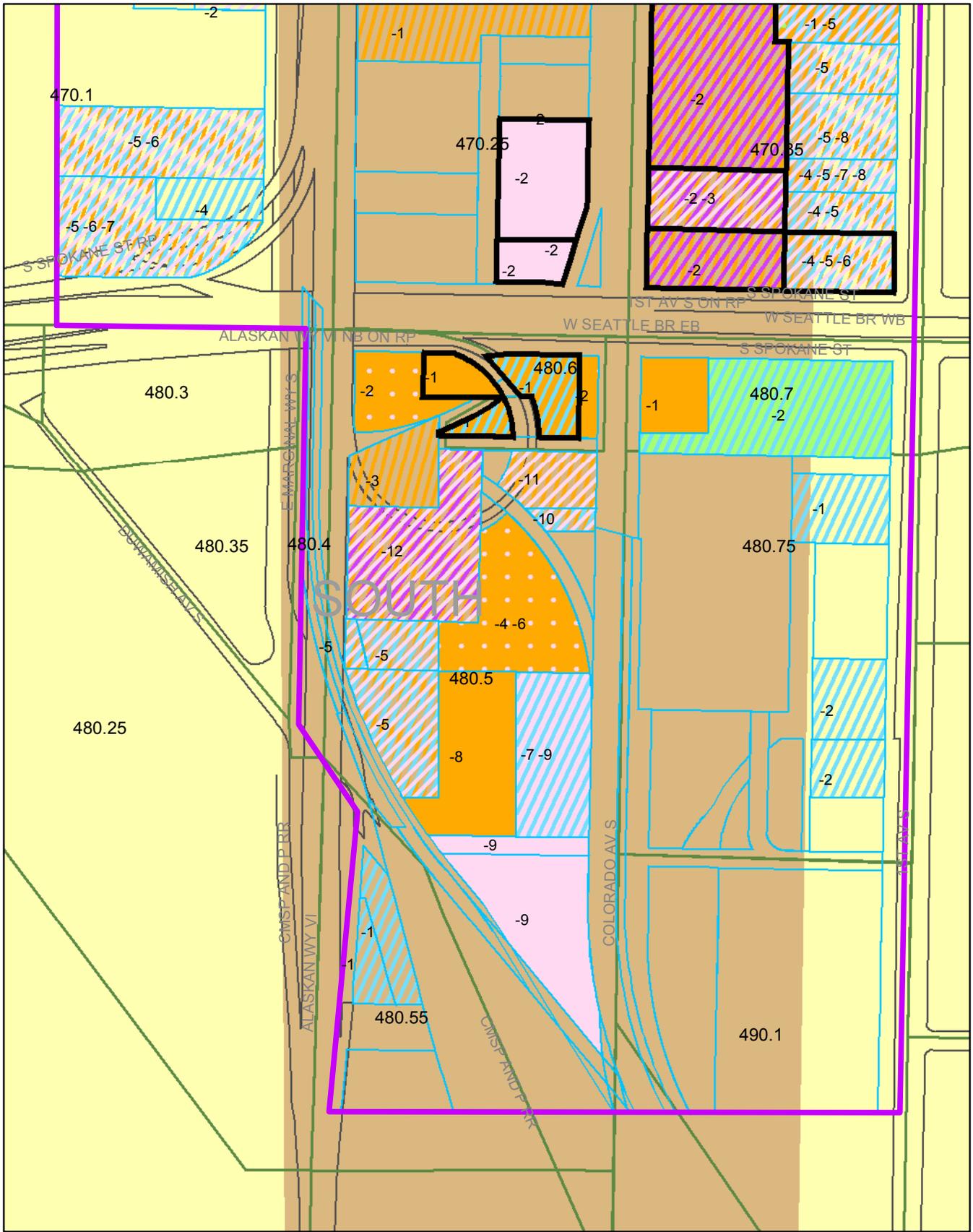
South

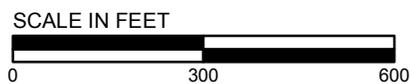
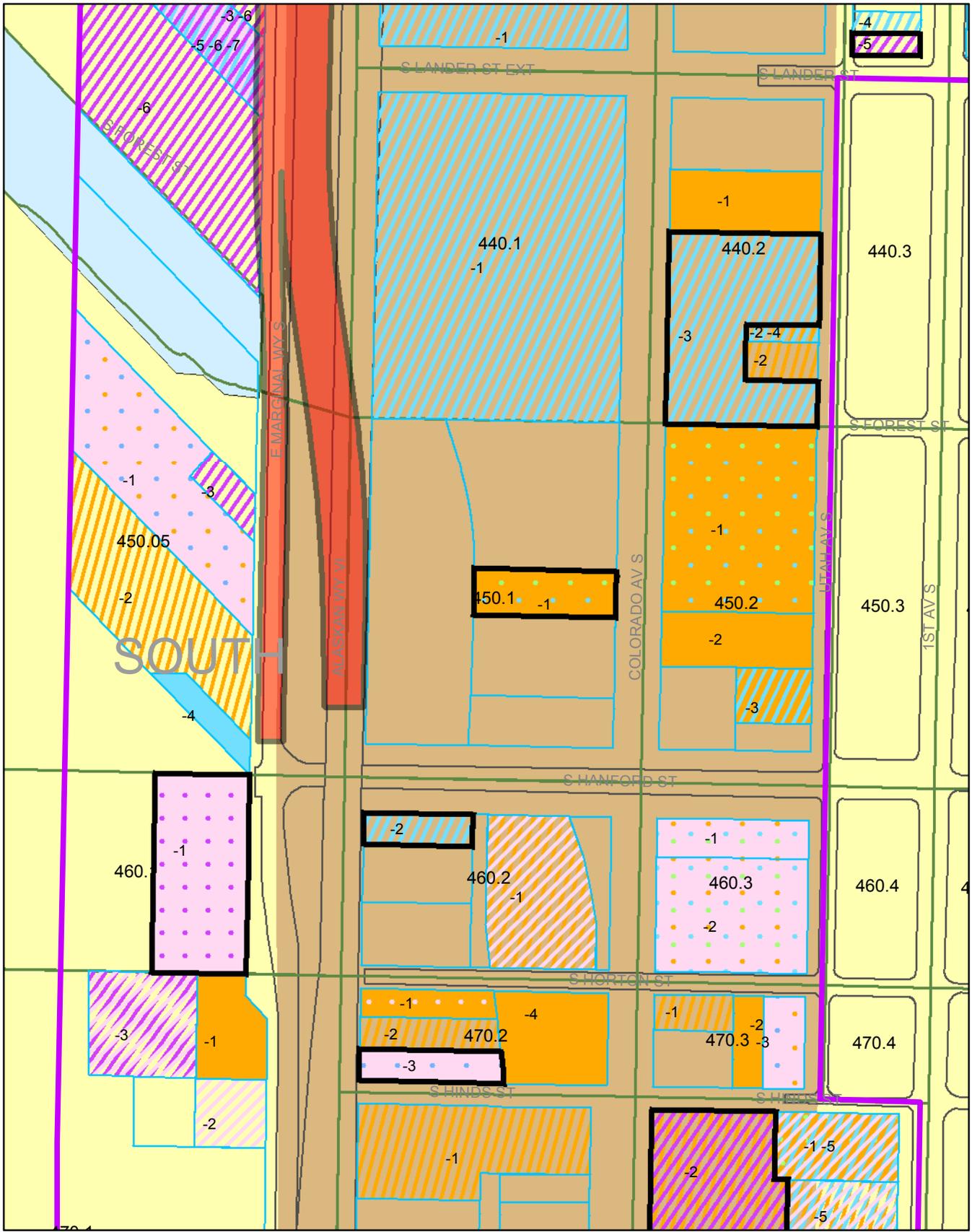
Central

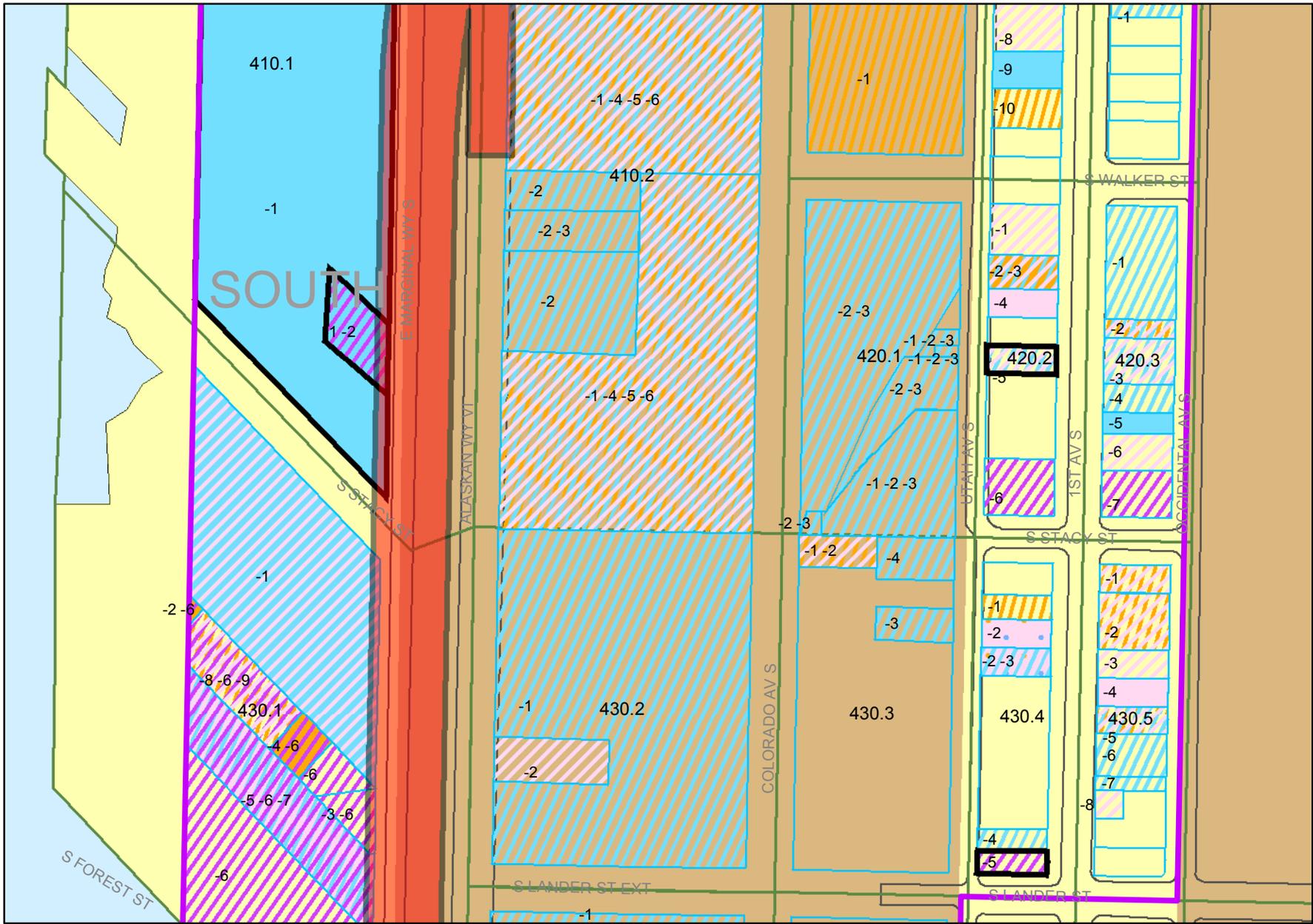
North Waterfront

North

Seawall



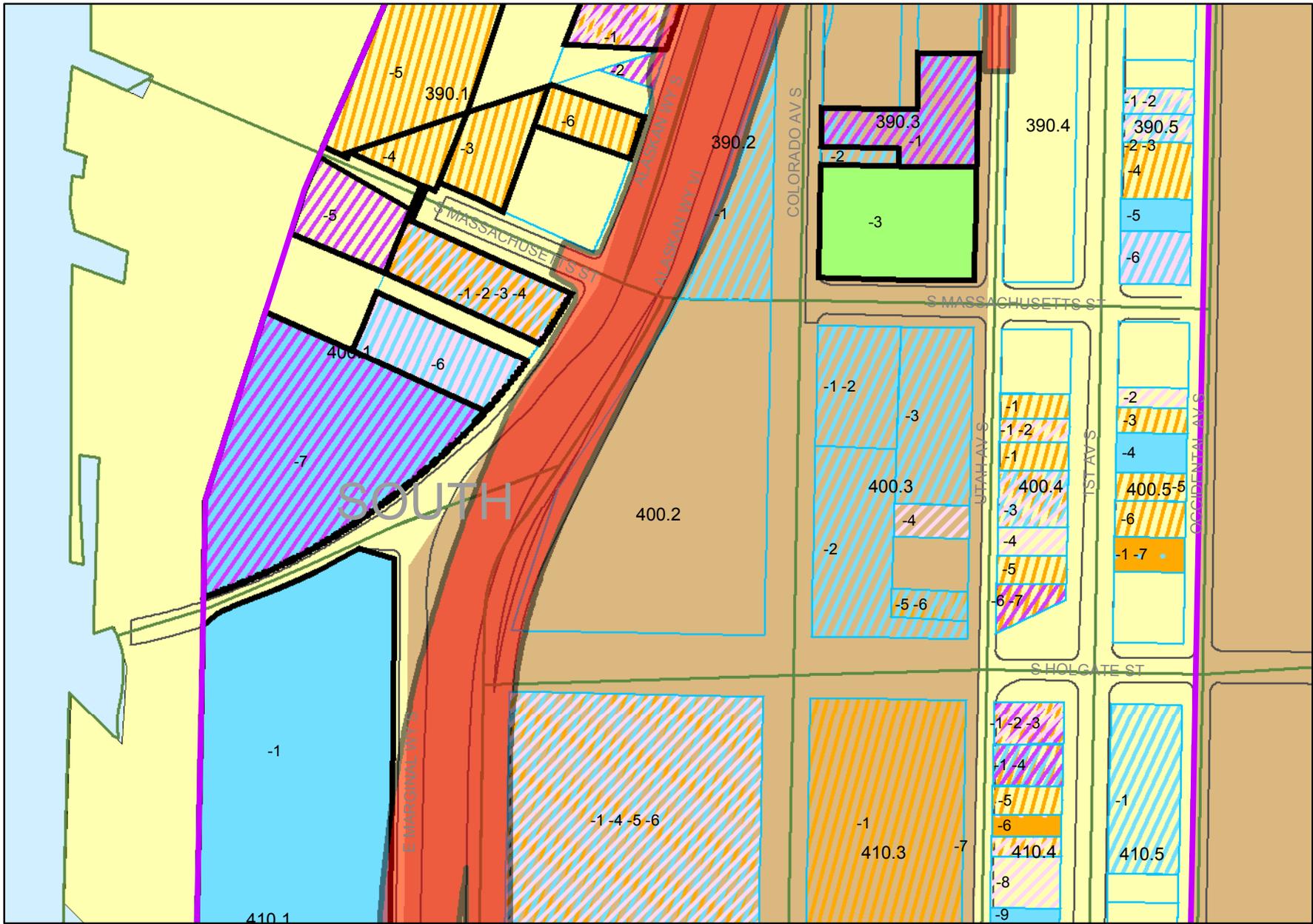




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**Exhibit 4-1**  
**Plan of Sites with**  
**Documented and Potential**  
**Contaminant Releases**  
*Sheet 3 of 14*





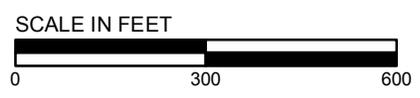
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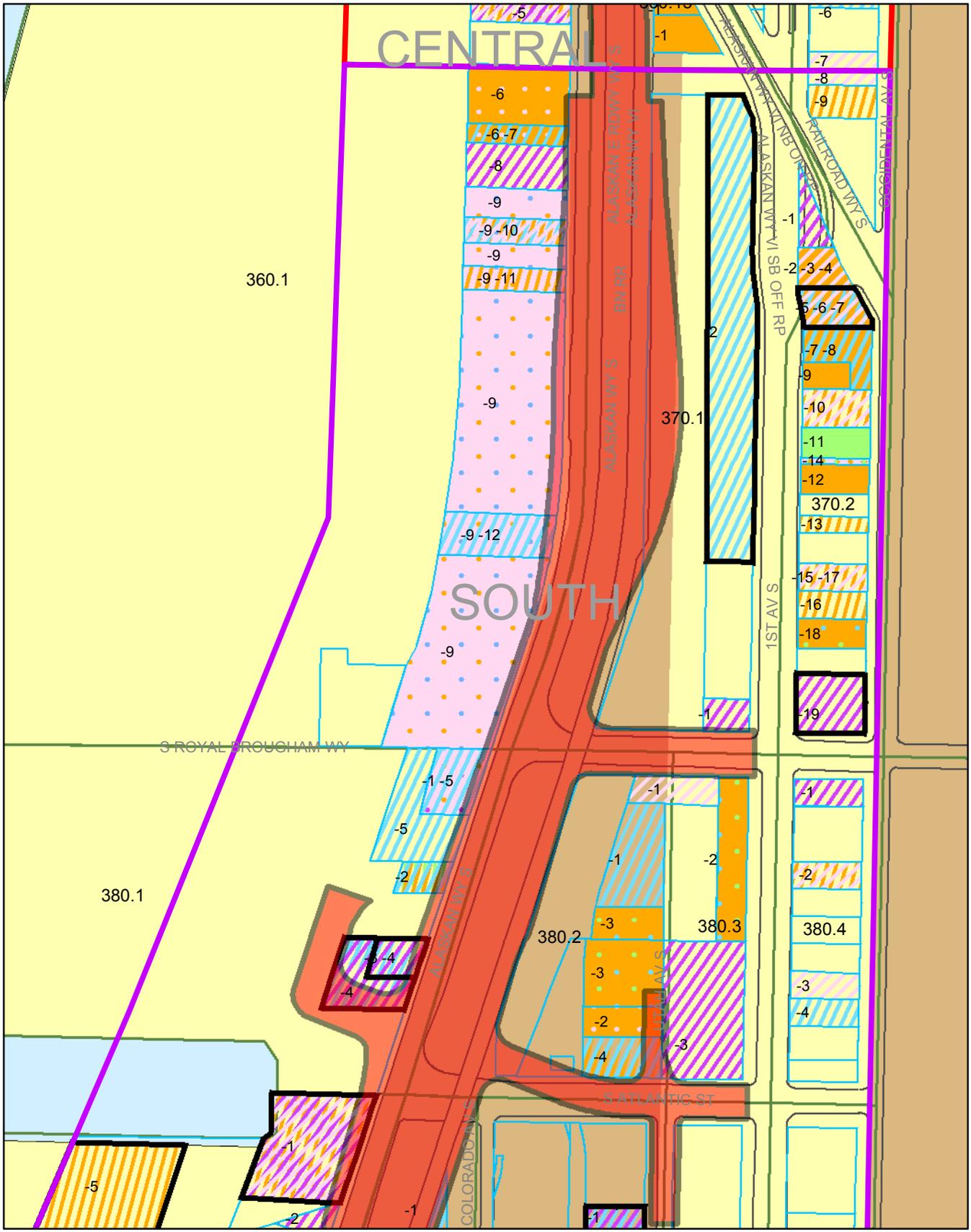
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**Exhibit 4-1**  
**Plan of Sites with**  
**Documented and Potential**  
**Contaminant Releases**

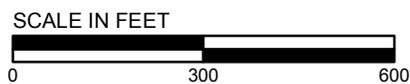
Sheet 4 of 14



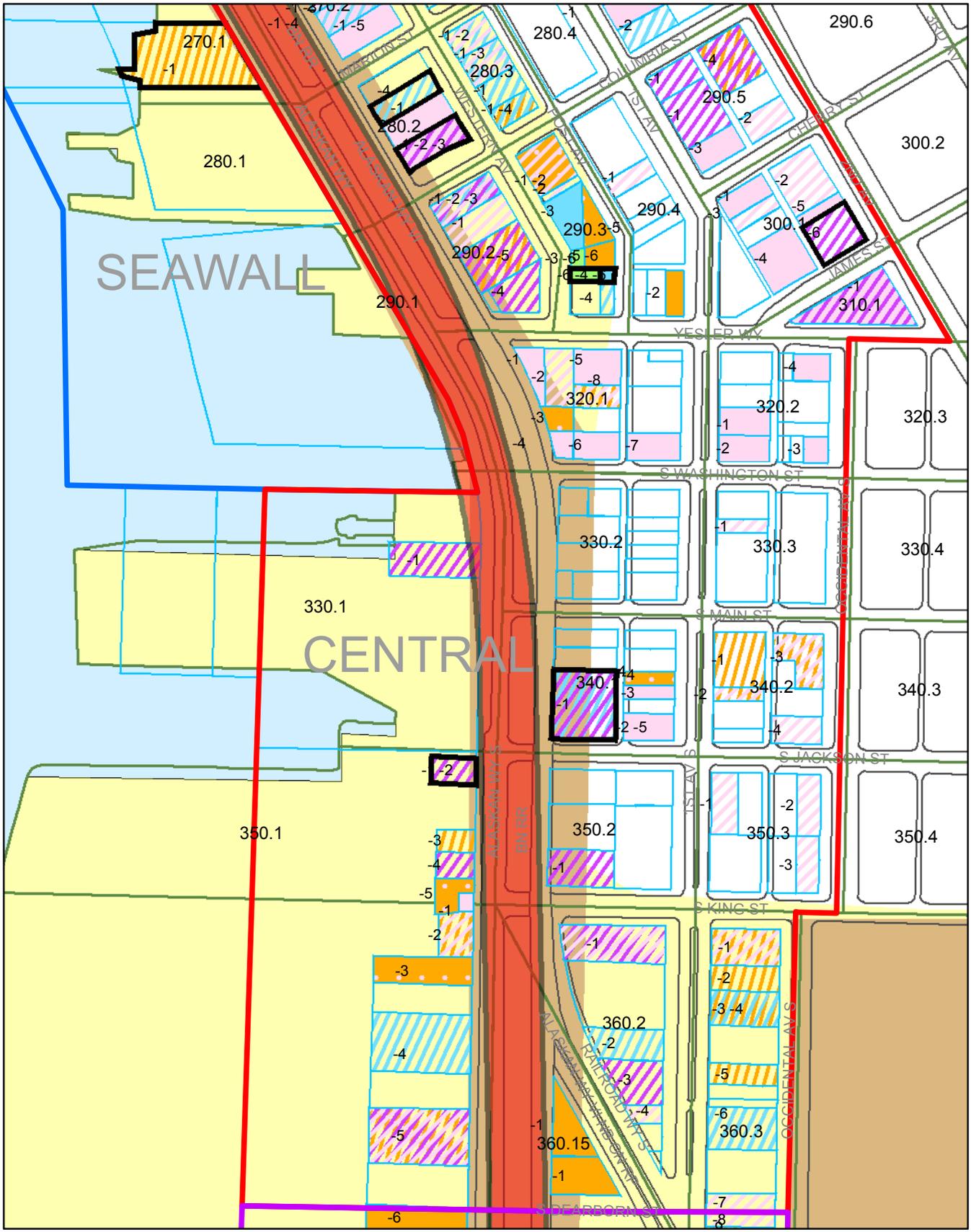
Sheet 4 of 14



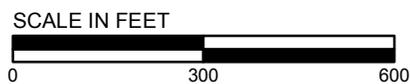
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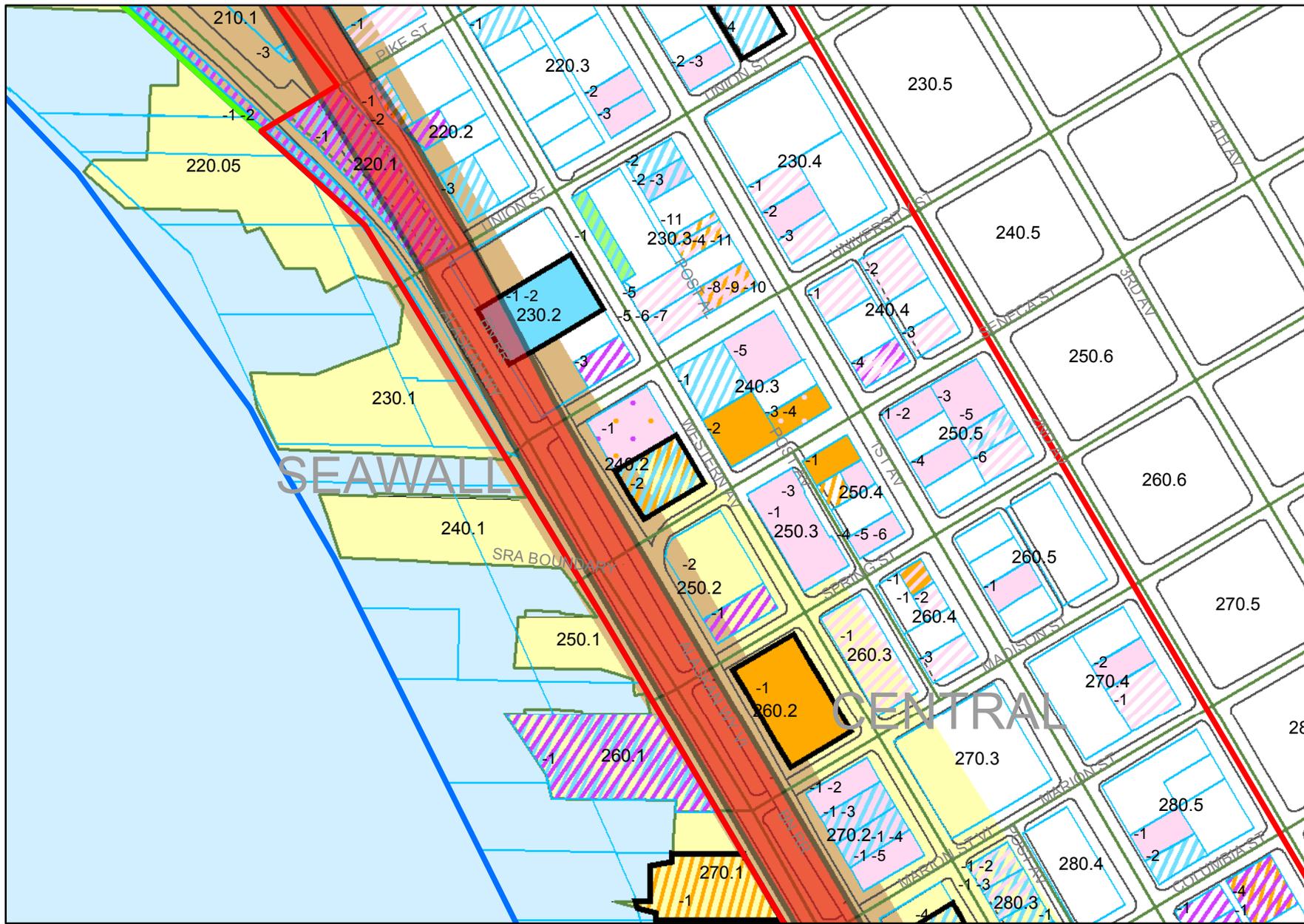
**Exhibit 4-1**  
**Plan of Sites with**  
**Documented and Potential**  
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*Sheet 5 of 14*



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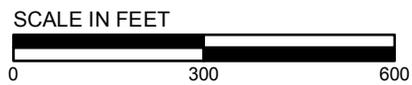


**Exhibit 4-1**  
**Plan of Sites with**  
**Documented and Potential**  
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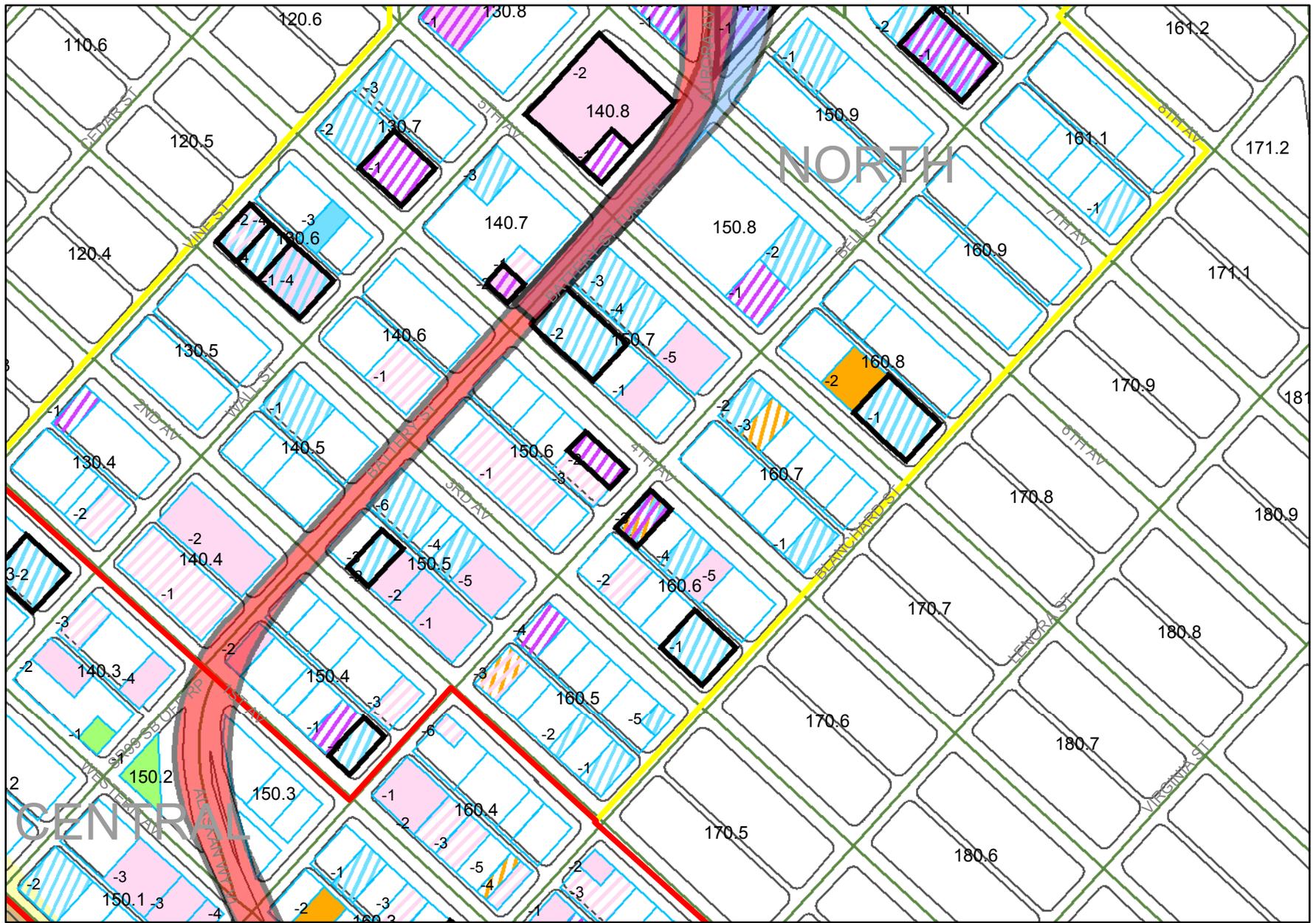
SHANNON & WILSON, INC. E:/21-1-09490-002/AVD/AWW\_122env\_exhibit\_4\_1\_hazardous\_landscape\_Jan-06.mxd 1-17-06 AJC

**Exhibit 4-1**  
**Plan of Sites with**  
**Documented and Potential**  
**Contaminant Releases**  
*Sheet 7 of 14*







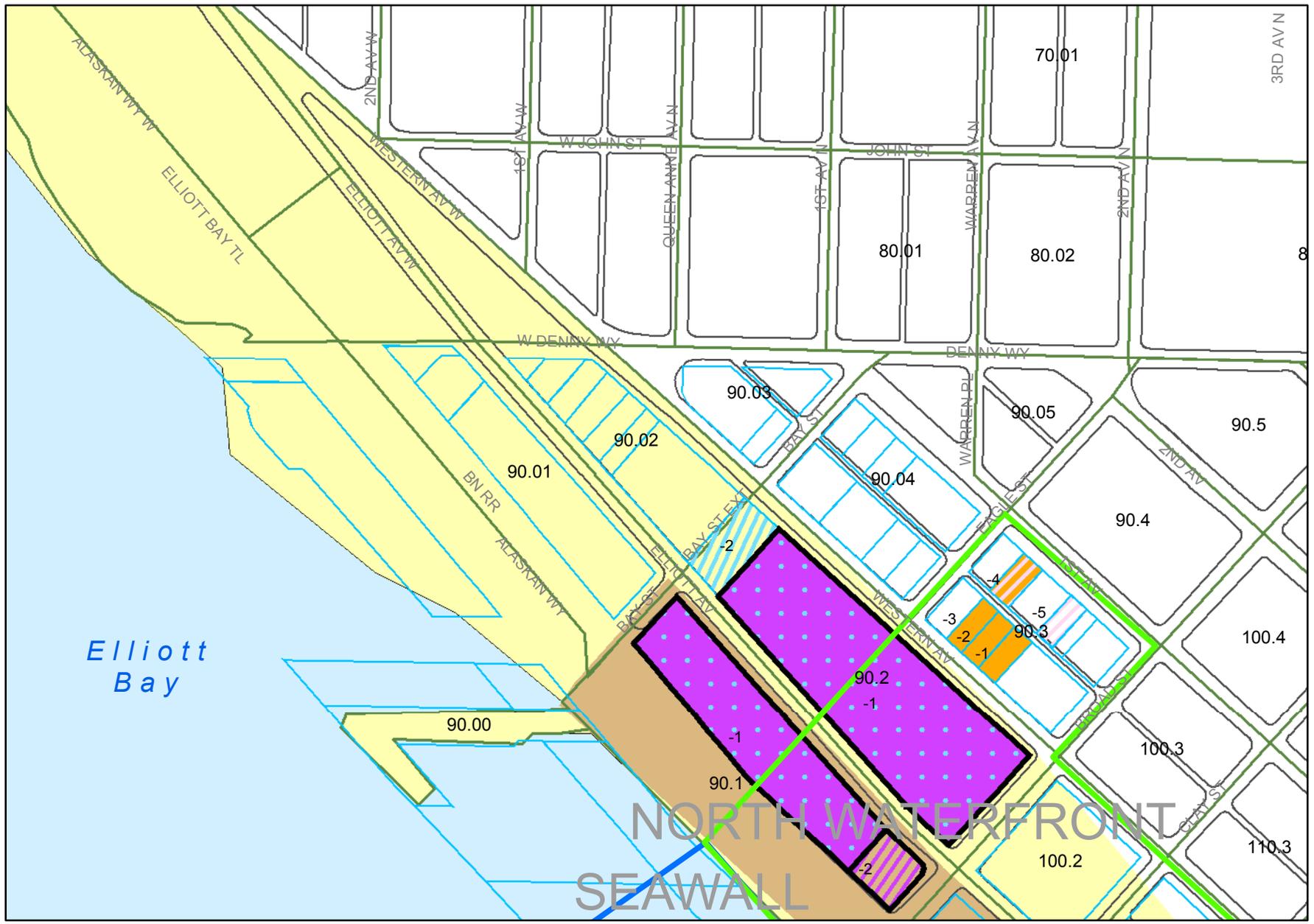


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**Exhibit 4-1**  
**Plan of Sites with**  
**Documented and Potential**  
**Contaminant Releases**  
*Sheet 10 of 14*



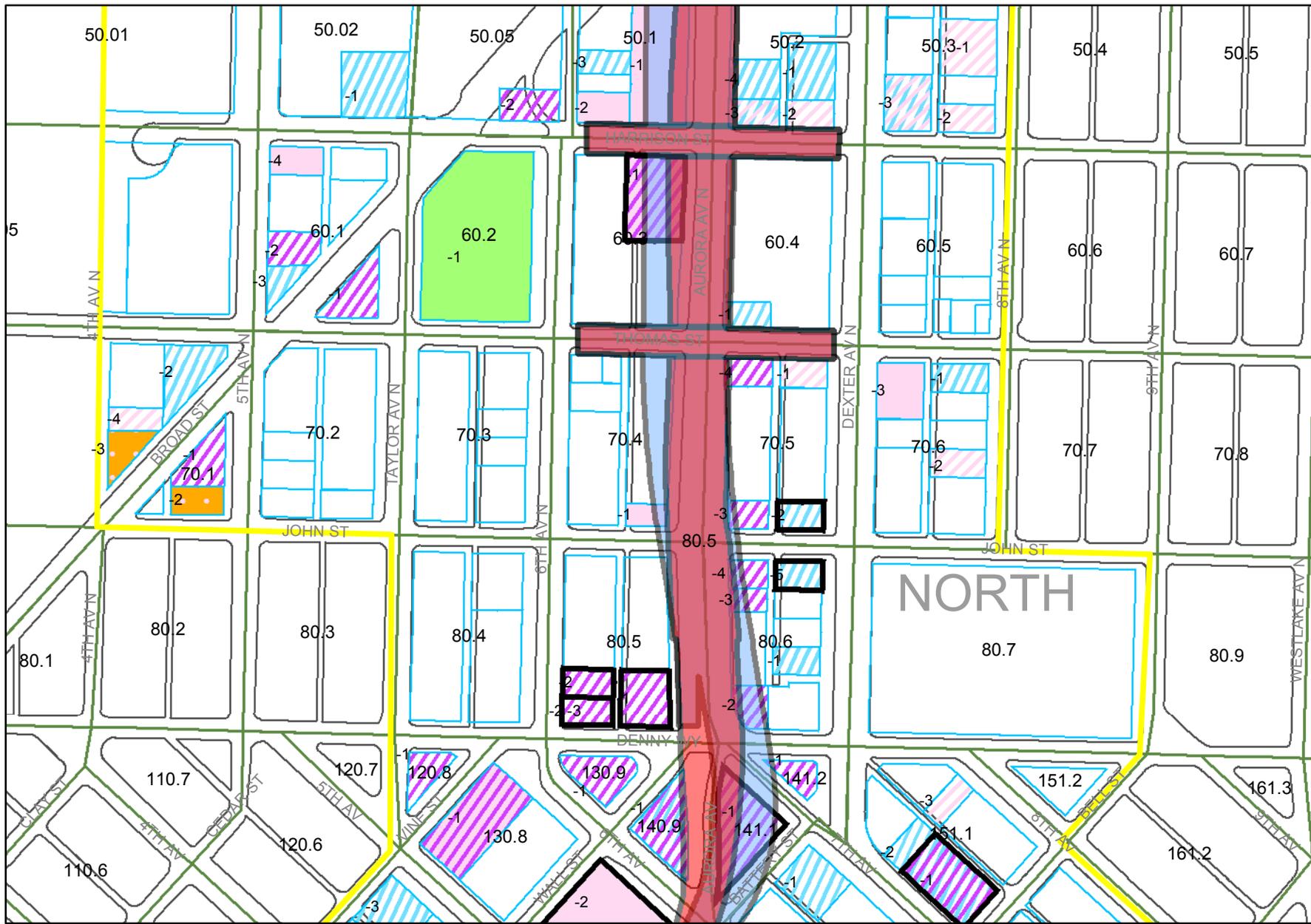
Sheet 10 of 14



SHANNON & WILSON, INC. E:/21-1-09490-002/AVD/AWV\_122env\_exhibit\_4\_1\_hazardous\_landscape\_Jan-06.mxd 1-17-06 AJC

**Exhibit 4-1**  
**Plan of Sites with**  
**Documented and Potential**  
**Contaminant Releases**  
*Sheet 11 of 14*

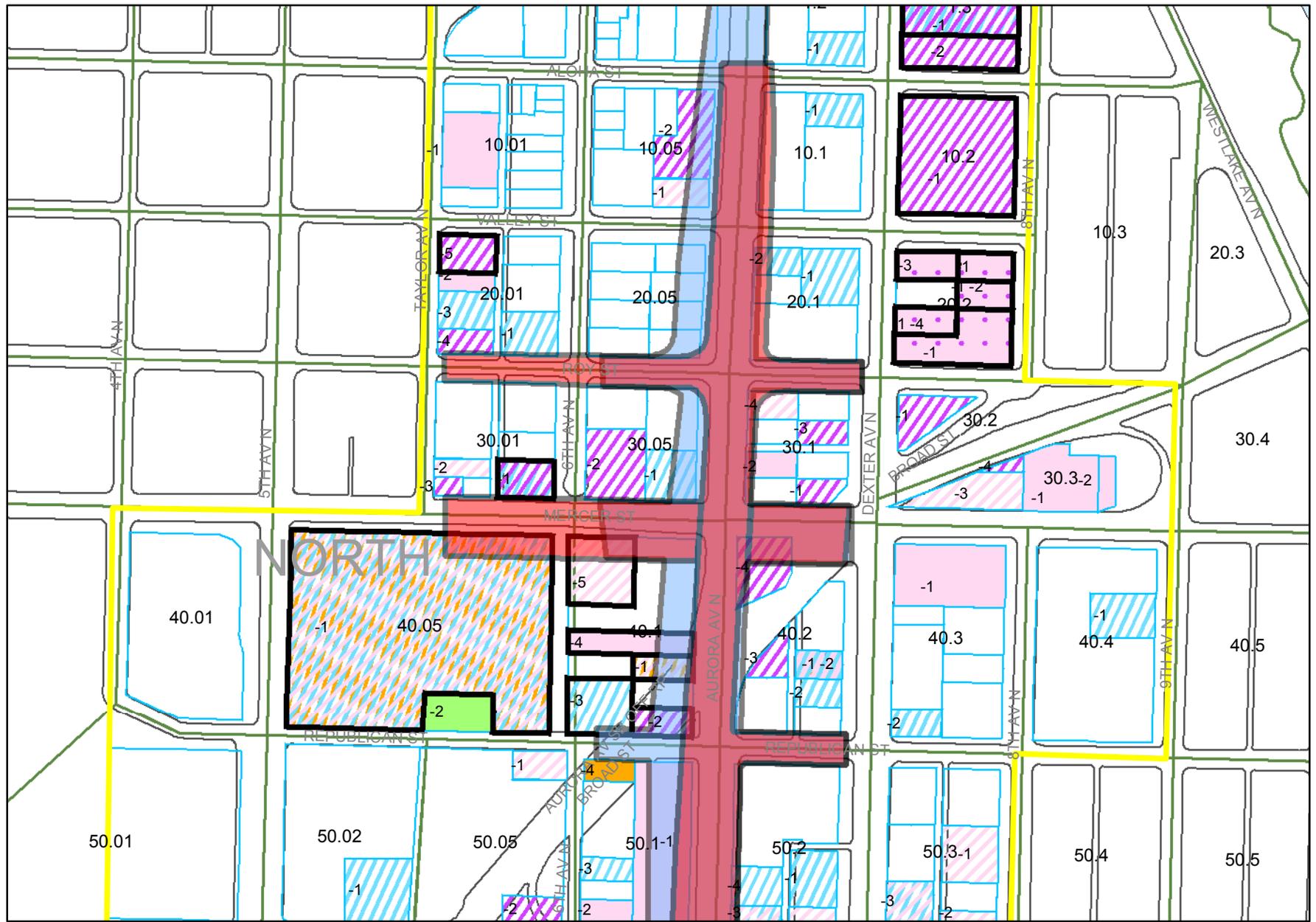




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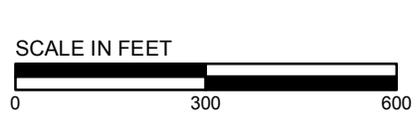
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**Plan of Sites with**  
**Documented and Potential**  
**Contaminant Releases**  
*Sheet 12 of 14*

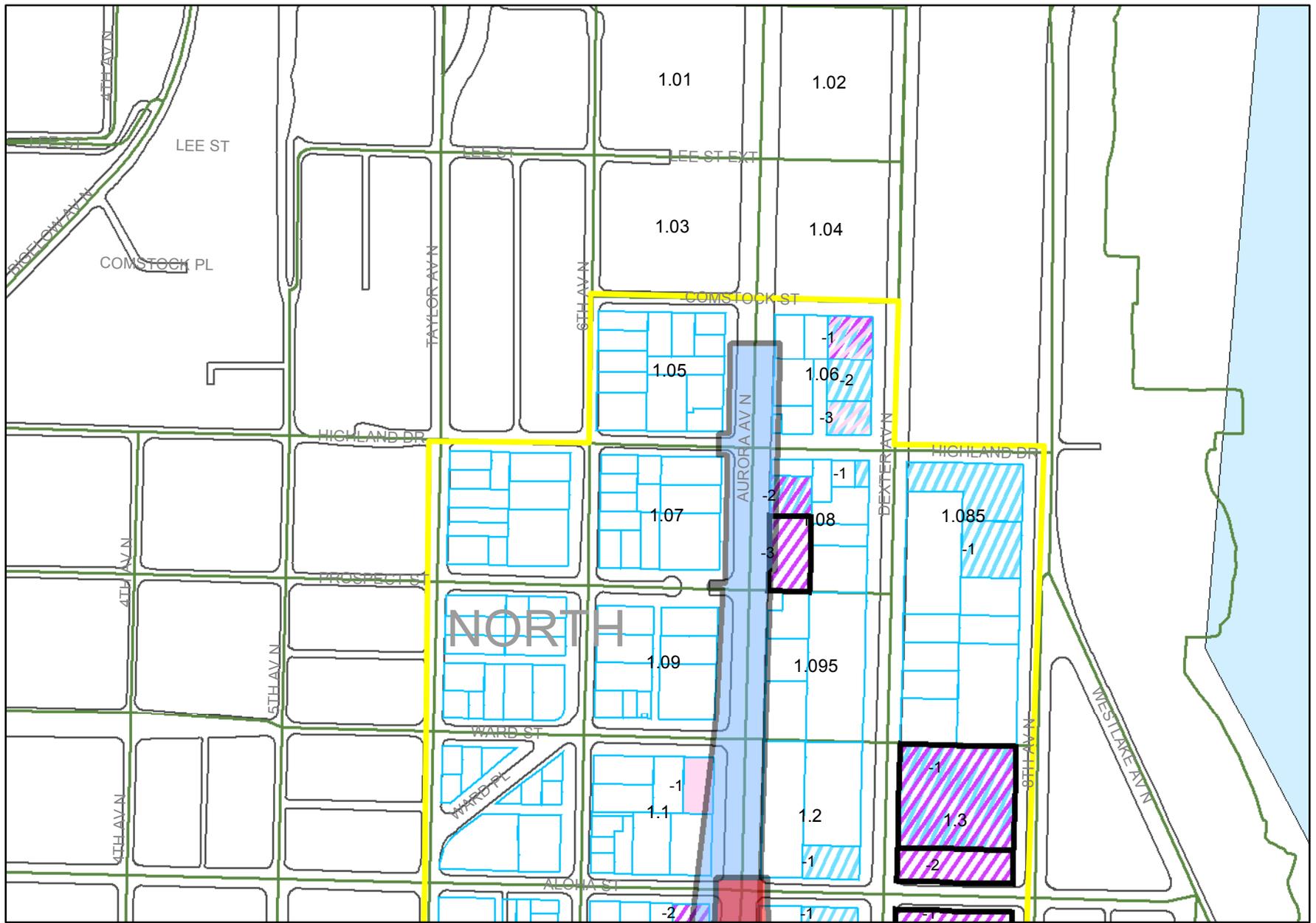




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**Exhibit 4-1**  
**Plan of Sites with**  
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**Exhibit 4-1**  
**Plan of Sites with**  
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**Block 430.1.** This block is bounded by S. Stacy Street on the north and E. Marginal Way on the east. It is currently marine Terminal 30. Former land uses have included chemical manufacturing, foundries, gasoline stations, boiler and machine works, chemical storage and transport, and a transit shed. The following is a list of current or former operations in the block, the applicable map reference numbers, approximate years of operation (if known), and an indication of the type of operation:

**Site 430.1-1,** 1951 to 1960, chemical manufacturing.

**Site 430.1-2,** 1916 to 1950, foundry and forge.

**Site 430.1-3,** 1943 to 1956, gasoline station.

**Site 430.1-4,** 1916, brass foundry and pattern shop.

**Site 430.1-5,** 1916 to 1950, chemical containers.

**Site 430.1-6,** 1918 to 1951, gasoline station.

**Site 430.1-7,** 1969, transit shed.

**Site 430.1-8,** 1916, boiler works.

**Site 430.1-9,** 1916, machine works.

None of the sites has known contamination. However, based on historic land use throughout this block, the potential exists for metals, solvents, gasoline, and other petroleum products to be present. Six properties are ranked as substantially contaminated: **Sites 430.1-1, -2, -3, -4, -5, and -6.** These properties pose a moderate risk to the project, and the remainder would pose a low risk to the project.

**Block 430.3.** A 6-story office building and three 9-story warehouses currently occupy this block. Previous occupants include a machine shop constructed in 1925 (**Site 430.3-1**), a blacksmith and chain manufacturer in 1916 (**Site 430.3-2**), a fuel company in 1938 (**Site 430.3-3**), and an automobile repair shop in 1950 (**Site 430.3-4**). Because these businesses occupied the block for a relatively short time, potential solvent, metals, and petroleum contamination is considered reasonably predictable, and these sites are considered a low risk to the project.

**Block 440.2.** A steel company occupied **Site 440.2-1** from at least 1938 to 1956. An iron and metals company occupied **Site 440.2-2** in 1938. Because the steel company occupied the property for more than 20 years, the potential for metals contamination on this property is considered substantially contaminated. **Site 440.2-1** is considered a moderate risk to the project. The potential for metals contamination on the iron and metals company property

is considered reasonably predictable, and **Site 440.2-2** is considered a low risk to the project.

An automobile sales and service company occupied **Site 440.2-3** from 1975 to 1990. An automotive center also occupied **Site 440.2-4** from 1970 to 1975. These properties are considered a low risk to the project because petroleum contamination, if present, is considered reasonably predictable.

The railroad had a carpenter and paint shop at **Site 430.2-2**. Former railroad facilities also included fuel storage and a shop in **Block 420.1**; warehouses and a workshop in **Block 410.3**; and coal yards at **Sites 400.3-1** and **-3**, oil tanks at **Site 400.3-2**, and paint storage at **Site 400.3-4**. The assessor's records indicate that there is currently a shed at the site. **Site 390.2-1** formerly contained railroad car repair sheds. None of these properties was included on agency lists that identify where known contamination exists. However, petroleum contamination has frequently been encountered in previous excavations and borings within the railroad area along the Seattle waterfront. The railroad operations may have resulted in subsurface contamination from petroleum products, solvents, and metals. The potential contamination is considered to be reasonably predictable, and the properties are classified as low risk to the project.

An oil house was located at **Site 430.2-1**, and at least three fuel tanks, a blacksmith shop, a machine shop, a power house, an oil shed, and multiple garages were located in **Block 410.2** (**Sites 410.2-1, 410.2-2, 410.2-3, 410.2-4, 410.2-5, and 410.2-6**). These sites are considered reasonably predictable but are considered a moderate risk due to the potential for encountering widespread petroleum contamination and localized solvent and metal contamination.

**Block 390.1.** The following is a summary of available information for the remainder of **Block 390.1**:

**Site 390.1-2.** A filling station was constructed in 1924. It had four USTs, each with a 550-gallon capacity. It is not known whether the USTs have been removed.

**Site 390.1-3,** repair shop, 1950.

**Site 390.1-4,** warehouse, built in 1934.

**Site 390.1-5.** Archive records indicate that several machine shops and a blacksmith shop were located at or near this property in the early 1900s. In 1995, soils contaminated with lead were discovered at the site, with the highest concentrations located near the waterfront. Information from Washington State Department of Ecology's (Ecology) files indicates that

the owner planned to conduct an independent interim action to remove contaminated soil during a project to construct a new shipping and receiving facility. No additional information regarding the current site status was available.

**Site 390.1-6**, 1916, blacksmith shop.

The potential for gasoline contamination at **Site 390.1-2** is reasonably predictable but is considered a moderate risk due to the potential for encountering widespread contamination.

The potential for metals contamination at **Sites 390.1-3, -4, -5, and -6** is considered to be reasonably predictable based on a usage history of less than 20 years. Known contamination at **Site 390.1-5** may have been remediated. The referenced properties pose a low risk to the project.

**Site 380.1-2.** The 1916 Sanborn map indicates a junk (rag picking) facility, plus warehouses and several machine shops in this block. The most likely forms of contamination from the past uses include petroleum products, solvents, and metals. The potential contamination is considered to be reasonably predictable, but the risk to the property is considered moderate because of the potential for encountering widespread contamination.

**Site 380.1-4.** Historical records indicate that a garage/service station was formerly located at this site, constructed in 1914. A portion of the property was also a coal briquette plant in 1916 (**Site 380.1-3**). More recently, the site has had warehouses, offices, and maintenance facilities. Ecology's records indicate that two USTs (gasoline and diesel) were removed in 1993, and a waste oil UST was closed in place in 1994. Gasoline contamination was encountered, and waste oil contamination remains beneath the office trailer. Benzene in groundwater was detected at a concentration greater than the Model Toxics Control Act (MTCA) cleanup level. Groundwater flow is toward the northwest.

Potential contamination on **Site 380.1-3** and **Site 380.1-4** is considered to be reasonably predictable, but the risk to the project is considered to be moderate because known contamination exists on the site and there is a potential to encounter widespread contamination.

Historic land uses at **Site 360.1-5** include a former machine shop/gas and oil/repair shop from at least 1916 through 1969. The potential for encountering gasoline or petroleum contamination is reasonably predictable, but the site is considered a moderate risk to the project due to the potential for encountering widespread contamination.

**Site 360.1-8.** Historical records indicate that the gasoline and service station was present from at least 1938 to 1960. The site is considered to be a moderate risk to the project because although potential contamination by gasoline is reasonably predictable, there is a potential to encounter substantial gasoline contamination.

**Site 350.1-2.** Historical records indicate that a Union Oil Company gasoline station was present at this location from at least the 1930s to the 1950s. A warehouse was constructed in 1963–64. The EDR (2001) report indicates that a final UST cleanup report was issued in October 1992. The report indicates that three diesel USTs were removed, two leaded gasoline USTs and two waste oil USTs were closed in place, and that one unleaded gasoline UST remains in operation. A subsurface investigation indicated that petroleum contamination was detected but at concentrations below cleanup levels. No remedial actions were implemented. The investigation report also indicates that groundwater flow at this site is toward the north or northeast. The potential for petroleum (gasoline and oil) contamination is reasonably predictable, but the property is considered a moderate risk to the project because a UST remains on the site and there is a potential for encountering substantial gasoline contamination.

**Site 380.3-3.** Historical records indicate that a truck sales and service company that had gas tanks operated in the 1950s and 1960s. The potential for gasoline contamination is reasonably predictable, but the risk to the project is considered to be moderate due to the potential for encountering widespread gasoline contamination at this site.

#### Non-Validated Properties of Concern

Properties associated with **Blocks 470.25** and **460.2** are no longer considered properties of concern and have been removed from this section because they are no longer relevant to the project.

**Block 400.2** was added as a property of concern because of the potential for contamination associated with railroad operations.

Two other properties of concern that were added include a sewage regulation station on **Block 430.1** and a museum located on **Block 380.1**. No specific hazardous materials risks were identified with these properties, other than the potential for asbestos and lead-based paint in these buildings.

#### 4.1.2 Central – S. Dearborn Street to Battery Street Tunnel

The historical land use is the same as in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 4.1.2). Field data from the 2005 investigation are included in Section 4.3.

As described in the 2004 Appendix U (Section 4.1.2), gasoline- and diesel-range hydrocarbons were detected in soil by the parking garage located on S. Jackson Street near the Alaskan Way surface street. Gasoline has also been detected in the subsurface between S. Jackson and S. King Streets, based on borings drilled in 2004 and 2005. Petroleum-contaminated soil was also detected at sites adjacent to the Alaskan Way surface street, east of the trolley track at Columbia Street. Bunker C, a heavy oil used by the steam company at the steam plant at University Street and Western Avenue, has contaminated soil and groundwater. This oil has migrated off site and has been encountered in borings near the Alaskan Way Viaduct footings. The lateral extent of this plume is not known, but it appears to extend approximately one-half block south of University Street.

Hydrogen sulfide (H<sub>2</sub>S) may be present in the subsurface either as the result of a contaminant release or as a natural byproduct of breakdown of organic matter under oxygen-reducing conditions. H<sub>2</sub>S was encountered in an excavation for a sewer project at the intersection of Alaskan Way and University Street. At that location, H<sub>2</sub>S dissolved in groundwater exceeded Metro's discharge criterion, necessitating treatment prior to discharge. At this concentration, H<sub>2</sub>S also poses a potential hazard to site workers because it is a toxic gas; at low concentrations, it presents a nuisance odor. H<sub>2</sub>S could result from decay of wood and sawdust anywhere along the waterfront and has been noted in many of the borings drilled in the area.

Petroleum-contaminated groundwater has been encountered in an area between Yesler Way and S. King Street.

#### Validated Properties

**Block 140.2** has been removed from this section because it is no longer adjacent to the proposed alignment and/or the property is no longer relevant to the project.

The method for assessing the risk associated with each validated property is the same as in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 4.1.1); however, the risk has changed for the following properties because of changes in the proposed alignment or because a property would potentially be acquired or modified.

**Site 350.2-1.** A gasoline station was at this location from at least the 1930s to 1950s or later. A three-story parking garage structure was built at the site in 1984. Geotechnical soil borings indicated the presence of coal and charcoal to depths up to 23 feet below the ground surface. The risk of encountering petroleum contamination is considered reasonably predictable. However,

because the types and quantities of contamination are unknown, the site is considered a moderate risk for the proposed project.

**Site 330.1-1.** The seawall would be rebuilt along the western and northern perimeters of Pier 50. Construction would be adjacent to Pier 48. This site was formerly occupied by a gasoline station that operated for at least a brief period (1938 and 1940 Polk Directories). Gasoline odor was noted in a boring in the Alaskan Way right-of-way east of Pier 50. The risk of encountering gasoline contamination is reasonably predictable; however, the site is considered a moderate risk because of the potential for encountering widespread contamination associated with the former gasoline station.

**Site 290.2-4.** A gasoline station and auto repair shop operated at this location from at least 1938 to 1965. The most likely contaminants that may be encountered due to past operations are gasoline and other petroleum products. The risk of encountering petroleum hydrocarbons is considered to be reasonably predictable, but the risk to the project is considered moderate because there is a potential for encountering widespread contamination on this site.

**Block 270.2** is located adjacent to the east side of the alignment for both alternatives. Historical land uses for individual properties in this block are described in the following paragraphs:

**Site 270.2-1,** printing companies, chemical company. A five-story warehouse with space for retail was built in 1910 and covered the entire block. The businesses listed above operated from at least 1951 to 1990. The potential exists for substantial solvent contamination from the past uses, possibly involving the entire block. It is considered a high risk for the project.

**Site 270.2-2.** The cleaner was listed in Polk Directories from 1951 to 1965. The potential exists for substantial solvent contamination by solvents, and the site is considered a high risk for the project.

**Site 270.2-3.** This site was listed in Polk Directories from 1938 to 1943. The potential exists for reasonably predictable petroleum contamination, and the site is considered a low risk for the project.

**Site 270.2-4.** This site was listed in Polk Directories in 1938 and 1940. The potential exists for reasonably predictable petroleum contamination, and the site is considered a low risk for the project.

**Site 270.2-5.** The cleaner on this site was listed in Polk Directories in 1938 and 1940. The potential exists for substantial solvent contamination, and the site is considered a high risk for the project.

**Site 260.3-1.** This site has been occupied by a department store since 1905. Based on a Sanborn map, a printing company also occupied the site in 1969. Because the printing company appears to have been present only a short time, solvent contamination, if present, is considered reasonably predictable and a low risk to the project.

**Site 250.2-1.** A gasoline station operated here from at least 1962 through 1974. Potential contamination by gasoline is evaluated to be reasonably predictable, but the site is considered a moderate risk to the project because of the potential for encountering substantial contamination at this site.

**Site 220.2-1.** Archive information indicates that a machine shop was built at this site in 1918. Operations included auto repair, electric blacksmithing, acetylene welding, and machine work. The potential for metals, solvents, and/or petroleum contamination is considered to be reasonably predictable based on a usage history of less than 20 years. The site is considered to pose a moderate risk to the project.

**Site 220.2-3.** Tax assessor information indicates that a garage was constructed on this site in 1950, and a Sanborn map indicates that a truck service shop was located on the property in 1969. The potential for petroleum contamination is expected to be reasonably predictable, but the site is considered a moderate risk because of the potential for encountering substantial contamination.

**Block 190.2.** The following is a summary of available information regarding past uses of the properties on this block:

**Site 190.2-1,** 1919 to 1940, gasoline station.

**Site 190.2-2,** 1969, auto repair shop.

**Site 190.2-3,** 1951 to 1960, printers.

**Site 190.2-4,** 1925, gas station and metal plating; torn down for viaduct construction.

There is potential for gas or petroleum contamination at **Sites 190.2-1** and **-2**. The sites are considered to be reasonably predictable. The auto repair shop is considered a low risk to the project, but the gasoline station is considered a moderate risk to the project due to the potential to encounter widespread contamination. The potential for solvents at **Site 190.2-3** is also considered to be reasonably predictable based on a usage history of less than 20 years; however, this property is considered a moderate risk to the project because of the potential for substantial solvent contamination. In addition, the presence of a former plating operation at **Site 190.2-4** may have resulted in substantial contamination from metals and solvents, and the site poses a moderate risk to the project.

#### Non-Validated Properties of Concern

There are no changes to non-validated properties of concern in this area.

#### 4.1.3 North Waterfront – Pine Street to Broad Street

The northern boundary of the north waterfront area has been changed to Broad Street rather than Myrtle Edwards Park. The historical land use is the same as in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 4.1.3).

#### Validated Properties

**Block 90.2** has been removed from this section because it is no longer adjacent to the proposed alignment and/or properties on this block would no longer be acquired or modified.

The method for assessing the risk associated with each validated property is the same as in the 2004 Appendix U (Section 4.1.1); however, the risk has changed for the following properties because of changes in the proposed alignment or because a property would potentially be acquired or modified.

**Site 210.1-2.** A service station on this site operated from at least 1935 through 1970. The property is currently a parking lot. The potential for petroleum contamination is considered to be reasonably predictable; however, the site is considered a moderate risk to the project due to the potential to encounter widespread contamination on this property.

#### Non-Validated Properties of Concern

There are no changes to non-validated properties of concern in this area.

#### 4.1.4 North – Battery Street Tunnel to Comstock Street

A dry cleaning business operated on **Block 50.1** from 1945 through at least 1960. A dry cleaning supply and laundry dyes business, an auto repair shop, and a battery factory also operated historically at the site. The property is currently a parking lot.

Low levels of solvents were detected in soil borings drilled in the right-of-way adjacent to the site (Shannon & Wilson, Inc. 2005b); these contaminants may be associated with the former dry cleaner or auto repair facilities in the area.

#### Validated Properties

**Blocks 50.02, 60.1, 70.05, and 70.1** have been removed from this section because they are no longer adjacent to the proposed alignment and/or the properties are no longer relevant to the project.

The method for assessing the risk associated with each validated property is the same as in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 4.1.1); however, the risk has changed for the following properties because of changes in the proposed alignment or because a property would potentially be acquired or modified. In addition, some properties have been added because the proposed alignment has been extended to Comstock Street.

**Block 151.1.** A used car lot (1950) and an auto dealership/service garage (1965–1969) were previously located on **Site 151.1-1**. Between 1950 and 1965, an auto repair shop occupied **Site 151.1-2**. Petroleum contamination, if present on these sites, is considered reasonably predictable. **Site 151.1-3** was occupied by a paint shop in 1949. Because the paint shop only occupied the site for a short time, the potential for solvent contamination is considered reasonably predictable. The sites on this block are considered a low risk to the project.

**Site 141.2-1.** A gasoline and service station operated on this site from 1934 to at least 1940. The potential for gasoline contamination is reasonably predictable, but this site is considered a moderate risk to the project because of the potential to encounter substantial contamination.

**Block 140.9.** A gas station that also repaired autos occupied this block from the 1940s through the 1960s. The site is currently a parking lot. Gasoline contamination is reasonably predictable; however, this site is considered a moderate risk to the project because of the potential to encounter widespread contamination.

**Block 140.8.** A gas station operated at this site (**Site 140.8-1**), and a newspaper facility encompasses the rest of the block (**Site 140.8-2**). The newspaper site was listed as a Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) no further action site after an anonymous complaint was received regarding discharge of spent fixer and other photographic chemicals down the sewer drain. Since 1994, chemicals have been transported to a photo processor for disposal. The newspaper site is listed as a high risk to the project because of the potential to encounter substantial solvent contamination. The gas station is considered a low risk to the project based on its location and because petroleum, if present, is reasonably predictable.

**Site 130.9-1.** A gasoline station operated at this site from 1934 to at least 1975. The potential for gasoline contamination is reasonably predictable, but the site is considered a moderate risk to the project due to the potential to encounter widespread contamination.

**Block 130.8.** This block was occupied by an auto repair shop in 1949–50, a dry cleaning facility in 1951, and a printing company in 1965 (**Site 130.8-1**). This property is a moderate risk to the project because of the potential for encountering substantial solvent contamination associated with the dry cleaners and printing company.

**Block 80.6.** Numerous gas stations and auto repair businesses operated on this block, including an auto rebuild shop (**Site 80.6-1**), a former gas station (**Site 80.6-2**), another former gas station (**Site 80.6-3**), an auto electric business (**Site 80.6-4**), and a commercial property (**Site 80.6-5**). Petroleum-contaminated soil was encountered at the commercial property. A heating oil tank was removed, and soil was over excavated to the extent feasible. Contamination could extend beneath W. John Street, but it was not remediated so as not to undermine the road. Both former gas station sites are currently parking lots. **Sites 80.6-2, 80.6-3, and 80.6-4** are considered a moderate risk to the project because there is a potential to encounter substantial petroleum contamination. It is possible that gasoline-contaminated soil could be encountered in the Aurora Avenue N. right-of-way; however, **Sites 80.6-1 and 80.6-5** are considered a low risk to the project because petroleum, if it has migrated to the right-of-way, is reasonably predictable.

**Block 80.5.** John Street and Aurora Avenue N. bound this block. No historic or known sources of contamination have been identified for this parcel, which is currently vacant land; however, petroleum-contaminated soil was identified on the properties directly south and southwest. The site to the south (**Site 80.5-1**) was a gas station from 1934 to 1953 and is considered a moderate risk to the project due to the potential for widespread petroleum contamination.

There was a gas station and auto repair shop on **Sites 80.5-2 and -3** from 1938 to 1989. Based on Ecology files, the USTs have been removed from the former gas station site, and contaminated soil has been either removed or treated on site. The sites are considered a low risk to the project because petroleum, if present, is reasonably predictable.

**Site 70.4-1.** The cleaners and laundry operated from the 1930s until at least the 1950s. A dry cleaning UST was noted on the Sanborn map. The site is currently a five-story motel that was constructed in 1959. Dry cleaning fluids, if released, could have migrated into the adjacent right-of-way. The site is considered substantially contaminated and a high risk to the project because solvent contamination may be widespread.

**Site 60.3-1.** A dry cleaning business operated at the site from 1946 through at least 1951. A gas station also operated at the site during the same period. The site was redeveloped as a three-story hotel in 1961. Dry cleaning solvents

trichloroethylene and tetrachloroethylene (TCE and PCE) have been documented in soil and groundwater at the former dry cleaning facility site.

A summary of the finding of the Phase II investigation conducted at this site in April 2000 follows:

Subsurface soils consist primarily of clay and silty clay, interbedded with layers of sand and silty sand. Six borings were drilled at the site. SB-1 was located approximately 25 feet west of Aurora Avenue N. and 85 feet south of Harrison Street, near the apparent source.

A hot spot exists at a depth of 12.5 feet below ground surface at location SB-1, where PCE was detected in the soil at a concentration of 13,000 parts per million (ppm). The concentration at a depth of 17.5 feet decreased to 1.2 ppm, and if excavated, the soil would be considered a dangerous waste.

Borings SB-3, located 20 feet east of SB-1 near Aurora Avenue N., and SB-4, located 22 feet north of SB-1, were drilled to 20 feet below ground surface. PCE and TCE were detected in both soil borings at concentrations above MTCA Method A criteria. PCE was detected at 1.5 ppm (SB-3) and 1.3 ppm (SB-4) and TCE was detected at 0.17 ppm (SB-3) and 0.11 ppm (SB-4). The MTCA Method A cleanup level is 0.05 ppm for PCE and 0.03 ppm for TCE.

Two deep borings, SB-1 and SB-6, were drilled to depths of approximately 60 feet and 65 feet below ground surface, respectively. PCE and vinyl chloride were detected in soil samples from these borings. In SB-6, located 72 feet north of SB-4, PCE was detected at 0.47 ppm at a depth of 15 feet below the ground surface and vinyl chloride was detected at 0.15 ppm at a depth of 25 feet below the ground surface. SB-6 is approximately 30 feet south of Harrison Street.

Groundwater was encountered at a depth of 51 feet below ground surface in SB-1, located near the hot spot adjacent to the former building. Groundwater was not encountered in SB-6, located approximately 90 feet north of SB-1. Gasoline (1.5 ppm), PCE (4,100 parts per billion [ppb]), TCE (2,600 ppb), and cis-1,2-dichloroethylene (1,400 ppb) were detected in the groundwater sample. The MTCA Method A criterion is 5 ppb for both TCE and PCE. The action level for gasoline is 1.0 ppm (Waterstone Environmental Inc. 2000).

Although lower concentrations of solvents were encountered in other soil borings, those borings only extended to depths of 20 to 25 feet below ground surface. The eastern, western, and southern boundaries of the perched groundwater were not established.

Soil contaminated with high concentrations of these solvents, if excavated, would be classified as dangerous waste requiring disposal at a Resource

Conservation Recovery Act Subtitle C landfill. Soil with lower concentrations of solvents may be excluded from disposal as a dangerous waste, with Ecology approval. However, soil contaminated with low concentrations of solvents would require special procedures for disposal at an approved landfill. Treatment methods for reducing the solvent concentrations in situ also should be evaluated.

The site is considered a high risk to the project due to the potential to encounter known solvent and gas contamination.

**Block 50.3.** This block was occupied by a print shop in 1951 and 1956 (**Site 50.3-1**), a woodworking and painting shop in 1950 (**Site 50.3-2**), and an auto factory garage in 1930 (**Site 50.3-3**). Potential contaminants associated with these site uses, including solvents and petroleum, are considered reasonably predictable and a low risk to the project because the businesses occupied the property for a relatively short time.

**Site 50.1-1** was occupied by a dry cleaner from 1945 through at least 1960. No site investigation has been performed; the property is currently used as a parking lot. The City of Seattle currently owns the site. **Site 50.1-2** was occupied by a dry cleaning supplies and laundry dyes store, a furniture repair and upholstering shop, and a spray painting company between 1924 and 1950. Because of the former use and/or storage of solvents on both of these sites, they are considered substantially contaminated and pose a high risk to the project.

**Site 50.1-3** was occupied by an auto repair shop from 1950 to 1969. There is a reasonably predictable potential for petroleum contamination at this site, and it poses a low risk to the project. **Site 50.1-4** was occupied by a battery manufacturer from 1938 to 1956. There is potential for substantial metal contamination at this site, posing a moderate risk to the project.

**Block 40.2.** The following is a summary of available information regarding past uses of the properties on this block located east of the alignment (adjacent):

**Site 40.2-1.** Occupants in the building constructed in 1928 include a battery company in 1938, automobile service in 1975, and a plating company since 1975.

**Site 40.2-2.** A garage building/warehouse was constructed in 1930; businesses have included primarily automobile service, plus printing between 1950 and 1956.

**Site 40.2-3.** Gasoline station built in 1934 and operated until at least 1951.

**Site 40.2-4.** Gasoline station built in 1930 and operated until at least 1956.

There is a reasonably predictable potential for gasoline and/or petroleum contamination at the above-listed sites. **Sites 40.2-1, 40.2-2, and 40.2-4** pose a low risk to the project because of their location relative to the alignment. **Site 40.2-3** poses a moderate risk to the project based on the potential to encounter widespread contamination at this property. In addition, there is potential for substantial contamination by metals and solvents at **Site 40.2-1**, which poses a moderate risk to the project.

**Block 40.1.** The entire block has been redeveloped as part of the Sonics Training Facility. Petroleum-contaminated soil was encountered during construction of the facility. Affected soil was excavated and transported to the adjacent King County Metro Transit Bus Barn site where it was treated. No assessment or cleanup was conducted. No further information was provided in the Ecology file. Numerous historical businesses operated on the block, including:

**Site 40.1-1**, 1950, machine shop.

**Site 40.1-2**, gasoline station built in 1933 and operated until at least 1951.

**Site 40.1-3**, 1938 to 1950, auto repair shop.

**Site 40.1-4**, 1938 to 1960, paint removal company.

**Site 40.1-5**, 1950, sports facility.

**Site 40.1-2** is in the Broad Street right-of-way. **Sites 40.1-1, -2, -3, and -5** are considered a moderate risk to the project because metals, gasoline, petroleum, and/or solvents contamination is reasonably predictable, but there is a potential to encounter widespread contamination on these sites. **Site 40.1-4** poses a high risk to the project because of the potential for substantial contamination by solvents.

**Block 40.05.** This entire block was a maintenance, fueling, and storage facility for streetcars, trolleys, and buses from the early 1900s. The following is a summary regarding former site uses:

**Site 40.05-1.** The facility on this site included a machine shop. Nine USTs were removed in 1990, and three additional USTs were removed in 1996. Approximately 3,000 to 4,000 cubic yards (cy) of petroleum-contaminated soil were treated on-site using land farming. Land farming apparently achieved petroleum hydrocarbon concentration below the current MTCA Method A cleanup criteria. The soil was reused on site. Some localized petroleum-contaminated soil remains beneath the site at concentrations above MTCA Method A criteria, and site groundwater contains gasoline-range petroleum hydrocarbons at concentrations above the MTCA Method A criteria (Shannon & Wilson, Inc. 2004). This site is considered a

low risk to the project because the potential for solvents, metals, and petroleum contamination is considered reasonably predictable, and petroleum contamination has been substantially remediated.

**Site 40.05-2.** A former substation transformer house was located at this site. The building has been removed. PCBs may be present in site soils. This site is considered substantially contaminated because of the potential presence of PCBs in site soils and is considered a moderate risk to the project.

**Block 30.3.** The property contains a masonry factory building constructed in 1924 and a vacant lot. Business operations on **Sites 30.3-1, 30.3-2, and 30.3-3** have included commercial sign painting, commercial printing, and/or a cabinet and sign shop from at least 1975 to 1990. The potential for solvent contamination at these sites from the painting, printing, and cabinetmaking operations is substantial, posing a moderate risk to the project.

A gas station also operated on this block from 1930 to 1956 (**Site 30.3-4**). The potential for gasoline contamination is reasonably predictable at this site; however, it is considered a moderate risk to the project due to the potential for encountering widespread gasoline contamination.

**Block 30.2.** An auto electric and gas station and auto repair shop operated from 1938 to 1960. The Seattle Department of Transportation currently owns the block. Most of the block is vacant land, with the exception of a building built in 1919 that is leased to a sign company. This property is considered reasonably predictable but a moderate risk due to the potential to encounter widespread gasoline contamination.

**Block 30.1.** Gasoline stations were located along Dexter Avenue N. (**Sites 30.1-1, 30.1-3**). A former laundry/varnish manufacturing facility (**Site 30.1-2**) was located on Mercer Street. The block was initially developed between 1919 and 1930. The gas stations were demolished in the 1940s. A flooring company also operated in 1938 (**Site 30.1-4**). The block has not been redeveloped. The gas station properties are considered a moderate risk to the project because petroleum contamination, if present, is considered reasonably predictable. The laundry/varnish manufacturing and flooring company sites are considered a moderate risk to the project because of potential solvent use (substantially contaminated).

**Site 10.2-1.** A maintenance shop, most likely used to fuel and/or repair vehicles, occupied this property from at least 1938 to 1985. The potential for petroleum contamination is reasonably predictable and poses a low risk to the project.

**Block 10.05.** A former sign painting company operated in 1950 (**Site 10.05-1**). A former gas station was operated at the site from 1950 to at least 1969 (**Site 10.05-2**). USTs were identified in Sanborn maps. An auto body repair shop currently occupies the site, and a painting shop operates from a building constructed in 1977. There is no record indicating whether the USTs were decommissioned or are still in place. The potential for solvent contamination at the former sign painting company is reasonably predictable based on a usage history of less than 20 years and poses a low risk to the project. The former gas station site is considered a moderate risk to the project because petroleum contamination is considered reasonably predictable, but there is the potential to encounter widespread gasoline contamination.

**Site 1.1-1.** A printers and publications store occupied this property from at least 1956 to 1970. This property is considered a high risk to the project because it could be substantially contaminated with solvents.

**Site 1.08-1.** A gasoline station/auto repair shop was constructed on this property in 1946 and operated until at least 1970. The building is currently used as a retail store. The potential for petroleum and gasoline contamination is considered to be reasonably predictable, posing a low risk to the project.

**Site 1.08-2.** An outboard motor repair shop occupied this site in 1950. Since 1960, a gasoline/service station has occupied the property. The potential for petroleum and gasoline contamination is considered to be reasonably predictable, posing a low risk to the project.

**Site 1.08-3.** A gasoline station was constructed on this property in 1952 and operated until at least 1969. The building is currently used as a retail store. The potential for gasoline contamination is considered to be reasonably predictable, posing a low risk to the project.

**Site 1.06-1.** An auto repair shop was located on this property from at least 1951 to 1990. The potential for petroleum contamination is considered to be reasonably predictable, posing a low risk to the project.

**Site 1.06-2.** An auto repair shop operated on this property from at least 1938 to 1985. In addition, a printing company occupied the property in 1943. The potential for petroleum and/or solvent contamination is considered to be reasonably predictable, posing a low risk to the project.

**Site 1.06-3.** A gas station and/or a motorcycle/auto repair shop operated on this property from 1938 to 1980. A custom sign producer occupied the property in 1985. The potential for petroleum and/or solvent contamination is considered to be reasonably predictable, posing a low risk to the project.

### Non-Validated Properties of Concern

The following blocks were added as properties of concern: **150.4, 140.6, 40.2,** and **20.05**. No specific hazardous materials risks were identified with these properties, other than the potential for asbestos and lead-based paint in the buildings on these properties. Underground heating oil tanks may be associated with buildings.

#### 4.1.5 Seawall – S. Washington Street to Broad Street

**Blocks 90.2 and 140.2** have been removed from this section because they are no longer adjacent to the proposed alignment and/or the properties are no longer relevant to the project.

## 4.2 Physical Environment

The physical environment within the corridor varies significantly from south to north and from the waterfront to the east. The following section presents a description of the physical environment and how it relates to the movement of contaminants in each area. There are few changes to the general discussion of the physical environment other than a noted increase in fill thickness.

Fine-grained and coarse-grained sediment and till soils are found in the area from S. Dearborn Street to Broad Street. Based on explorations conducted in 2004 and 2005, fill comprising a wide variety of materials was placed along the entire waterfront and ranges in thickness from a few feet to about 50 feet.

## 4.3 Field Data

In addition to the environmental sampling conducted in 2002 for preliminary design and the EIS, additional borings were drilled in 2004 and 2005 in the central and north sections to support continuing design of the Alaskan Way Viaduct (Shannon & Wilson, Inc. 2005a). Selected soil and groundwater samples were analyzed to identify contaminants that may affect disposal or treatment of soil and groundwater.

### 4.3.1 South – S. Spokane Street to S. Dearborn Street

The field data for the south area are the same as presented in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Section 4.3.1).

### 4.3.2 Central – S. Dearborn Street to Battery Street Tunnel

Subsurface conditions were similar to those described in the 2004 Draft EIS Appendix U (Section 4.3.2). However, additional subsurface data were collected in a geotechnical and subsurface study conducted along the

alignment in 2004 and 2005 (Shannon & Wilson, Inc. 2005a). Soil boring and monitoring well locations are shown in Exhibit 3-2. Gasoline was detected in boring CB-26 at 12 mg/kg, below the MTCA Method A cleanup level of 100 mg/kg. The boring is located along Alaskan Way near S. Jackson Street near a former gas station.

Creosote odor was encountered in many of the borings drilled along the waterfront, suggesting that the borings were drilled close to treated timbers. Based on field observations of sheen and creosote odor, selected soil samples were analyzed for petroleum hydrocarbons and polynuclear aromatic hydrocarbons (PAHs). Diesel- and oil-range petroleum hydrocarbons and PAHs were detected in these borings; however, concentrations of oil were generally below 2,000 mg/kg, the MTCA Method A cleanup level for oil (Shannon & Wilson, Inc. 2005a). Treated timber piles were historically used to support the railroad trestles, piers, and the elevated roadway (Alaskan Way) along the waterfront. Timbers were not typically removed, and fill was placed around the timbers to support new or upgraded existing trestles and piers.

Although elevated concentrations of lead were detected in a few soil samples, the concentrations were below the dangerous waste criterion. Lead concentrations ranged from to 6 mg/kg to 1,000 mg/kg. Less than 10 percent of the soil samples exceeded the MTCA Method A cleanup level for lead of 250 mg/kg (Shannon & Wilson, Inc. 2005a). The widespread low level of petroleum- and creosote-related contamination detected in soil is most likely the result of the numerous local sources of contamination (i.e., treated timbers and numerous small releases/drips from railroad operations).

Gasoline, at concentrations of less than 2 mg/L, was detected in groundwater samples collected from monitoring wells CB-25A and CB-27A, located near Yesler Way and S. King Street (Shannon & Wilson, Inc. 2005a). Monitoring well locations are shown in Exhibit 3-2.

#### **4.3.3 North Waterfront – Pine Street to Broad Street**

The field data for the north waterfront area are the same as in the 2004 Draft EIS Appendix U (Section 4.4.3).

#### **4.3.4 North – Battery Street Tunnel to Comstock Street**

In 2005, six borings were drilled in the Aurora Avenue N. right-of-way, north of the Battery Street Tunnel (Shannon & Wilson, Inc. 2005b). Low concentrations of solvents commonly associated with dry cleaning operations and other volatile organic compounds typically associated with gasoline were

detected in soil samples, indicating that releases may have occurred at adjacent sites.

#### 4.3.5 Seawall – S. Washington Street to Broad Street

The field data for the seawall area are the same as in the 2004 Draft EIS Appendix U (Section 4.3.5).

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## Chapter 5 OPERATIONAL IMPACTS AND BENEFITS

Five different Build Alternatives and the No Build Alternative were considered for the project in the Draft EIS. Since the March 2004 submittal of the Draft EIS, further analysis has been performed for the updated Tunnel Alternative (the Preferred Alternative) and the Rebuild Alternative, which is now called the Elevated Structure Alternative. The modifications to the Tunnel and Elevated Structure Alternatives do not change operational impacts or benefits relating to hazardous materials. Refer to the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report, for a discussion of operational impacts for all alternatives (Chapter 5). See Sections 5.2 and 5.4 of the Draft EIS for discussions of operational impacts for the Rebuild and Tunnel Alternatives.

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## Chapter 6 CONSTRUCTION IMPACTS

All of the Build Alternatives follow a similar route from approximately S. Spokane Street extending to the north waterfront. The impacts from construction are similar for the Tunnel Alternative (Preferred Alternative) and the Elevated Structure Alternative, except for tunnel excavation and potential dewatering. Construction impacts for the Rebuild and Tunnel Alternatives are discussed in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report, Sections 6.4 and 6.6, respectively. Construction impacts could arise if contaminated soil and/or groundwater are encountered during construction activities (e.g., drilled shafts and driven piles, deep soil mixing or jet grouting, excavation for retaining walls, stormwater detention vaults, and relocating utilities). Construction impacts are likely to occur where these activities are required on sites that have been identified as potentially contaminated, based on the evaluation presented in the discussion of the affected environment (Chapter 4). In addition to these sites, the alignment from S. Spokane Street to the north waterfront is underlain by fill that consists of soil and debris from unknown sources. Construction throughout this area could encounter contaminants such as petroleum, metals, and PAHs in the fill soils, as well as creosote-treated timbers and wood debris.

A summary of the volume of soil, spoils, and obstructions that would be removed during construction of either of the tunnel alignments and the Elevated Structure Alternative is presented in Exhibit 6-1 and described below for each project area from south to north. These volumes were estimated based on design parameters for each alternative and are estimated to be within 30 percent of actual volumes. A summary of the volumes of the materials to be removed that are potentially contaminated is presented in Exhibit 6-2 for the Tunnel and Elevated Structure Alternatives. The quantities are estimates based on the depth of Holocene deposits (fill, alluvium, estuarine, beach, and reworked glacial materials), which are assumed to be contaminated by former activities and the presence of creosote-treated timber piles that likely extend through the Holocene soils. All of the existing rail ballast, ties, and obstructions that would be removed were also assumed to be contaminated. Where construction activity would likely contaminate spoils (diaphragm walls, drilled shafts, deep soil mixing, jet grouting), all of the excavated material that would be removed during the construction activity was assumed to be contaminated. These volume estimates also include all of the pavement, surface structures, and obstructions, which would require special handling because of the presence of brick and asphalt mixed with the concrete.

Exhibit 6-1. Estimate of Excavation Quantities

Plan	Location	Excavation										
		Clear Exist. Rail Ballast, Ties Obstructions (CY)	Clear Exist. Pavement Structures, Obstructions (CY)	Retained Cut (CY)	Cut & Cover Tunnel Exc (CY)	Diaphragm Walls Exc (CY)	Piling & Drilled Shafts Exc (CY)	Deep Soil Mix Spoil (CY)	Jet Grout Spoil (CY)	Site Exc (CY)	Structural Exc (CY)	Total Exc (CY)
TUNNEL ALTERNATIVE	SOUTH (Reconfigured Whatcom Railyard)	28,000	85,000	12,000	0	0	23,000	152,000	0	0	10,000	310,000
	CENTRAL	8,000	98,000	99,000	1,000,000	167,000	18,000	8,000	13,000	187,000	41,000	1,639,000
	Stacked Tunnel	8,000	72,000	99,000	1,000,000	116,000	7,000	8,000	13,000	9,000	34,000	1,366,000
	Under Elliott & Western	0	26,000	0	0	43,000	8,000	0	0	178,000	7,000	262,000
	Steinbrueck Park Walkway	0	0	0	0	8,000	3,000	0	0	0	0	11,000
	NORTH WATERFRONT	9,000	38,000	0	0	0	0	0	82,000	78,000	0	207,000
	NORTH (Battery Street Tunnel to Aloha Street)	0	91,000	228,000	35,000	29,000	0	0	0	7,000	21,000	411,000
	Battery Street Tunnel - Unwidened Curves	0	13,000	0	27,000	3,000	0	0	0	7,000	2,000	52,000
	Partially Lowered Aurora to Aloha Street	0	78,000	228,000	8,000	26,000	0	0	0	0	19,000	359,000
	TOTALS:	45,000	312,000	339,000	1,035,000	196,000	41,000	160,000	95,000	272,000	72,000	2,567,000
TUNNEL ALTERNATIVE (OPTION)	SOUTH (Relocated Whatcom Railyard)	117,000	109,000	19,000	0	0	21,000	128,000	0	0	10,000	404,000
	CENTRAL	8,000	115,000	83,000	1,154,000	163,000	34,000	8,000	26,000	16,000	55,000	1,662,000
	Side-by-Side Tunnel	8,000	85,000	83,000	1,154,000	133,000	0	8,000	26,000	0	55,000	1,552,000
	Over Elliott & Western	0	30,000	0	0	30,000	21,000	0	0	16,000	0	97,000
	Steinbrueck Park Lid	0	0	0	0	0	13,000	0	0	0	0	13,000
	NORTH WATERFRONT	9,000	38,000	0	0	0	0	0	82,000	78,000	0	207,000
	NORTH (Battery Street Tunnel to Comstock Street)	0	157,000	491,000	132,000	136,000	2,000	0	0	1,000	124,000	1,043,000
	Battery Street Tunnel - North & South Curves Widened	0	18,000	0	132,000	10,000	0	0	0	1,000	124,000	285,000
	Lowered Aurora to Comstock Street	0	139,000	491,000	0	126,000	2,000	0	0	0	0	758,000
	TOTALS:	134,000	419,000	593,000	1,286,000	299,000	57,000	136,000	108,000	95,000	189,000	3,316,000

Exhibit 6-1. Estimate of Excavation Quantities (continued)

Plan	Location	Excavation										
		Clear Exist. Rail Ballast, Ties Obstructions (CY)	Clear Exist. Pavement Structures, Obstructions (CY)	Retained Cut (CY)	Cut & Cover Tunnel Exc (CY)	Diaphragm Walls Exc (CY)	Piling & Drilled Shafts Exc (CY)	Deep Soil Mix Spoil (CY)	Jet Grout Spoil (CY)	Site Exc (CY)	Structural Exc (CY)	Total Exc (CY)
ELEVATED STRUCTURE	SOUTH (Reconfigured Whatcom Railyard)	28,000	85,000	12,000	0	0	23,000	152,000	0	0	10,000	310,000
	SOUTH (Option - Relocated Whatcom Railyard)	117,000	109,000	19,000	0	0	21,000	128,000	0	0	10,000	404,000
	CENTRAL	8,000	90,000	0	0	0	86,000	78,000	58,000	75,000	10,000	405,000
	Elevated Structure Over Elliott & Western	8,000	78,000	0	0	0	63,000	78,000	58,000	31,000	7,000	323,000
		0	12,000	0	0	0	23,000	0	0	44,000	3,000	82,000
	NORTH WATERFRONT	9,000	38,000	0	0	0	0	0	84,000	81,000	0	212,000
	NORTH (Battery Street Tunnel to Aloha Street)	0	91,000	228,000	19,000	26,000	0	0	0	2,000	20,000	386,000
	Battery Street Tunnel - Unwidened Curves	0	13,000	0	11,000	0	0	0	0	2,000	1,000	27,000
	Partially Lowered Aurora to Aloha Street	0	78,000	228,000	8,000	26,000	0	0	0	0	19,000	359,000
	TOTALS: with Reconfigured Whatcom Railyard	45,000	304,000	240,000	19,000	26,000	109,000	230,000	142,000	158,000	40,000	1,313,000
TOTALS: Option - with Relocated Whatcom Railyard	134,000	328,000	247,000	19,000	26,000	107,000	206,000	142,000	158,000	40,000	1,407,000	

- Quantities shown are for the alternatives shown in the configuration drawings, dated June 30, 2005, and for Concept 12C (Partially Lowered Aurora), dated November 16, 2005. For options other than these basic configurations, quantities from the appropriate option may be substituted.
- For the purposes of this estimate, quantities have been calculated for the cut items noted and are rounded values. Actual export quantities may be less than those indicated as portions of these materials may be stored onsite and reused. Quantities do not include on-site grading and backfilling quantities for roadway finish grading, utility trenching, and backfilling.
- Clear Exist. Rail Ballast, Ties & Obstructions: Estimated quantity to clear existing railyard & waterfront streetcar ballast & ties. Assumed depth equal to 2'-6".
- Clear Exist. Pavement, Structures & Obstructions: Estimated quantity to clear existing roadway pavement, misc. structures. Assumed depth equal to 2'-0". Viaduct footings will be removed to full depth and the volumes for these existing footings are included within the excavation quantities.
- Retained Cut: Estimated excavated volume to construct roadway retained cuts (boat sections).
- Tunnel Excavation: Estimated excavation volume for tunnel excavation from the existing ground surface to bottom of tunnel excavation, excluding diaphragm wall excavations.
- Diaphragm Walls Exc: Estimated excavation volume from secant pile and/or slurry wall diaphragm walls.
- Piling & Drilled Shaft Exc: Estimated excavation volumes from drilled shafts.
- Deep Soil Mix Spoil: Estimated spoil from deep soil mix soil improvement. Deep soil mix spoil volume assumes soil improvement equal to 35% of the total improved soil mass and that of this volume 30% returns to the surface as soil-cement spoils.
- Jet Grout Spoil: Estimated spoil from jet grout operations use for the seawall. Spoil volume is calculated assuming 100% coverage of improved soil mass and that of this volume 25% returns to the surface as soil-cement spoils.
- Site Excavation: Estimated quantity of general site excavation, not otherwise classified.
- Structural Excavation: Estimated excavation quantity of excavation for structures, abutments, large utility vaults, etc.
- Retained Fill: Estimated fill volume to construct roadway retained fills.
- Tunnel Backfill: Estimated fill volume for backfill above the tunnel roof.
- Backfill: Estimated quantity of general backfill, not otherwise classified.
- RR Ballast & Roadway Base: Estimated quantity for rail ballast, waterfront streetcar, and new roadway base material. Quantity assumed equal to the clearance volumes of rail & roadway pavement.

Exhibit 6-2. Estimate of Contaminated Excavation Quantities

Plan	Location	Excavation										Total Exc (CY)
		Clear Exist. Rail Ballast, Ties Obstructions (CY)	Clear Exist. Pavement Structures, Obstructions (CY)	Retained Cut (CY)	Cut & Cover Tunnel Exc (CY)	Diaphragm Walls Exc (CY)	Piling & Drilled Shafts Exc (CY)	Deep Soil Mix Spoil (CY)	Jet Grout Spoil (CY)	Site Exc (CY)	Structural Exc (CY)	
TUNNEL ALTERNATIVE	SOUTH (Reconfigured Whatcom Railyard)	28,000	85,000	12,000	0	0	23,000	152,000	0	0	10,000	310,000
	CENTRAL	8,000	98,000	99,000	635,000	167,000	18,000	8,000	13,000	43,000	26,000	1,115,000
	Stacked Tunnel	8,000	72,000	99,000	635,000	116,000	7,000	8,000	13,000	9,000	22,000	989,000
	Under Elliot & Western	0	26,000	0	0	43,000	8,000	0	0	34,000	4,000	115,000
	Steinbrueck Park Walkway	0	0	0	0	8,000	3,000	0	0	0	0	11,000
	NORTH WATERFRONT	9,000	38,000	0	0	0	0	0	82,000	62,000	0	191,000
	NORTH (Battery Street Tunnel to Aloha Street)	0	91,000	80,000	35,000	29,000	0	0	0	7,000	8,000	250,000
	Battery Street Tunnel - Unwidened Curves	0	13,000	0	27,000	3,000	0	0	0	7,000	1,000	51,000
	Partially Lowered Aurora to Aloha Street	0	78,000	80,000	8,000	26,000	0	0	0	0	7,000	199,000
	<b>TOTALS:</b>	<b>45,000</b>	<b>312,000</b>	<b>191,000</b>	<b>670,000</b>	<b>196,000</b>	<b>41,000</b>	<b>160,000</b>	<b>95,000</b>	<b>112,000</b>	<b>44,000</b>	<b>1,866,000</b>
TUNNEL ALTERNATIVE (OPTION)	SOUTH (Relocated Whatcom Railyard)	117,000	109,000	19,000	0	0	21,000	128,000	0	0	10,000	404,000
	CENTRAL	8,000	115,000	83,000	852,000	163,000	34,000	8,000	26,000	3,000	48,000	1,340,000
	Side-by-Side Tunnel	8,000	85,000	83,000	852,000	133,000	0	8,000	26,000	0	48,000	1,243,000
	Over Elliot & Western	0	30,000	0	0	30,000	21,000	0	0	3,000	0	84,000
	Steinbrueck Park Lid	0	0	0	0	0	13,000	0	0	0	0	13,000
	NORTH WATERFRONT	9,000	38,000	0	0	0	0	0	82,000	62,000	0	191,000
	NORTH (Battery Street Tunnel to Comstock Street)	0	157,000	84,000	108,000	136,000	2,000	0	0	1,000	109,000	597,000
	Battery Street Tunnel - North & South Curves Widened	0	18,000	0	108,000	10,000	0	0	0	1,000	109,000	246,000
Lowered Aurora to Comstock Street	0	139,000	84,000	0	126,000	2,000	0	0	0	0	351,000	
<b>TOTALS:</b>	<b>134,000</b>	<b>419,000</b>	<b>186,000</b>	<b>960,000</b>	<b>299,000</b>	<b>57,000</b>	<b>136,000</b>	<b>108,000</b>	<b>66,000</b>	<b>167,000</b>	<b>2,532,000</b>	
ELEVATED STRUCTURE	SOUTH (Reconfigured Whatcom Railyard)	28,000	85,000	12,000	0	0	23,000	152,000	0	0	10,000	310,000
	SOUTH (Option - Relocated Whatcom Railyard)	117,000	109,000	19,000	0	0	21,000	128,000	0	0	10,000	404,000
	CENTRAL	8,000	90,000	0	0	0	86,000	78,000	58,000	50,000	10,000	380,000
	Elevated Structure	8,000	78,000	0	0	0	63,000	78,000	58,000	28,000	7,000	320,000
Over Elliot & Western	0	12,000	0	0	0	23,000	0	0	22,000	3,000	60,000	

Exhibit 6-2. Estimate of Contaminated Excavation Quantities (continued)

Plan	Location	Excavation											Total Exc (CY)
		Clear Exist. Rail Ballast, Ties Obstructions (CY)	Clear Exist. Pavement Structures, Obstructions (CY)	Retained Cut (CY)	Cut & Cover Tunnel Exc (CY)	Diaphragm Walls Exc (CY)	Piling & Drilled Shafts Exc (CY)	Deep Soil Mix Spoil (CY)	Jet Grout Spoil (CY)	Site Exc (CY)	Structural Exc (CY)		
ELEVATED STRUCTURE (continued)	NORTH WATERFRONT	9,000	38,000	0	0	0	0	0	84,000	65,000	0	196,000	
	NORTH (Battery Street Tunnel to Aloha Street)	0	91,000	80,000	19,000	26,000	0	0	2,000	7,000	225,000		
	Battery Street Tunnel - Unwidened Curves	0	13,000	0	11,000	0	0	0	2,000	0	26,000		
	Partially Lowered Aurora to Aloha Street	0	78,000	80,000	8,000	26,000	0	0	0	7,000	199,000		
	<b>TOTALS: with Reconfigured Whatcom Railyard</b>	<b>45,000</b>	<b>304,000</b>	<b>92,000</b>	<b>19,000</b>	<b>26,000</b>	<b>109,000</b>	<b>230,000</b>	<b>142,000</b>	<b>117,000</b>	<b>27,000</b>	<b>1,111,000</b>	
	TOTALS: Option - with Relocated Whatcom Railyard	134,000	328,000	99,000	19,000	26,000	107,000	206,000	142,000	117,000	27,000	1,205,000	

1. Quantities shown are for the alternatives shown in the configuration drawings, dated June 30, 2005, and for Concept 12C (Partially Lowered Aurora), dated November 16, 2005. For Options other than these Basic Configurations, quantities from the appropriate Option may be substituted.
2. For the purposes of this estimate, quantities have been calculated for the cut items noted and are rounded values. Actual export quantities may be less than those indicated as portions of these materials may be stored on-site and reused. Quantities do not include on-site grading and backfilling quantities for roadway finish grading, utility trenching, and backfilling.
3. Clear Exist. Rail Ballast, Ties & Obstructions: Estimated quantity to clear existing railyard & waterfront streetcar ballast & ties. Assumed depth equal to 2'-6".
4. Clear Exist. Pavement, Structures & Obstructions: Estimated quantity to clear existing roadway pavement, misc. structures. Assumed depth equal to 2'-0". Viaduct footings will be removed to full depth and the volumes for these existing footings are included within the excavation quantities.
5. Retained Cut: Estimated excavated volume to construct roadway retained cuts (boat sections).
6. Tunnel Excavation: Estimated excavation volume for tunnel excavation from the existing ground surface to bottom of tunnel excavation, excluding diaphragm wall excavations.
7. Diaphragm Walls Exc: Estimated excavation volume from secant pile and/or slurry wall diaphragm walls.
8. Piling & Drilled Shaft Exc: Estimated excavation volumes from drilled shafts.
9. Deep Soil Mix Spoil: Estimated spoil from deep soil mix soil improvement. Deep soil mix spoil volume assumes soil improvement equal to 35% of the total improved soil mass and that of this volume 30% returns to the surface as soil-cement spoils.
10. Jet Grout Spoil: Estimated spoil from jet grout operations use for the seawall. Spoil volume is calculated assuming 100% coverage of improved soil mass and that of this volume 25% returns to the surface as soil-cement spoils.
11. Site Excavation: Estimated quantity of general site excavation, not otherwise classified.
12. Structural Excavation: Estimated excavation quantity of excavation for structures, abutments, large utility vaults, etc.
13. Retained Fill: Estimated fill volume to construct roadway retained fills.
14. Tunnel Backfill: Estimated fill volume for backfill above the tunnel roof.
15. Backfill: Estimated quantity of general backfill, not otherwise classified.
16. RR Ballast & Roadway Base: Estimated quantity for rail ballast, waterfront streetcar, and new roadway base material. Quantity assumed equal to the clearance volumes of rail & roadway pavement.

At the north end of the project, the anticipated depth of project impacts is anticipated to be 35 feet. Both solvent and petroleum contamination have been encountered in soils in this area, resulting in both a problem waste and Washington State Dangerous Waste.

Construction activities would result in several types of impacts related to hazardous materials, as discussed in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Chapter 6).

The following subsections discuss changes in construction impacts specific to the updated Tunnel and Elevated Structure Alternatives.

## **6.1 Applicable Federal, State, and Local Regulations**

Numerous federal, state, and local regulations and policies govern decisions concerning hazardous materials and hazardous waste potential and liability issues. The applicable federal, state, and local regulations are the same as presented in the 2004 Draft EIS Appendix U (Section 6.1).

## **6.2 Liabilities Associated With Property Acquisition**

Additional properties and buildings that could be acquired or modified are listed in Exhibit 6-3. Additional information on relocations is provided in the 2006 Supplemental Draft EIS Appendix K, Relocations Technical Memorandum. Sites removed from Exhibit 6-3 are no longer directly relevant to the Tunnel or Elevated Structure Alternatives. Impacts (and possible liability) may still exist from properties that are adjacent to the alignment or farther from the alignment.

Sites with documented releases and potentially contaminated properties along the corridor likely would be acquired. In obtaining a contaminated property, WSDOT could become liable for a site cleanup. To avoid liability, WSDOT must perform "all appropriate inquiry" prior to obtaining any contaminated properties. If the inquiry identifies actual soil and/or groundwater contamination, WSDOT may pursue a right of action with past or current owners of the property, as described in the 2004 Draft EIS Appendix U (Section 6.2).

Exhibit 6-3. Properties of Concern

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)		Tunnel Alternative - Side-by-Side Tunnel		Elevated Structure with Reconfigured Whatcom Railyard		Elevated Structure with Relocated Whatcom Railyard	
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP
New Sites That Have Been Added to Exhibit 6-3														
1.1	1.1-1	printers and publications	2-story retail store, built 1950, hot water heat	N96	High	SOLV			x	x				
10.05	10.05-1	sign painting	2-story commercial building, built in 1932, no heat	N87	Low	SOLV			x	x				
10.05	10.05-2	gas station & auto repair	1-story commercial building, built 1977, Auto Body Repair & Painting	N88	Moderate	GAS			x	x				
20.1	20.1-2	engine repair	(Lots 5 & 6) 1-story office building, built 1937, HVAC	N82	Moderate	PET	x				x		x	
30.05	30.05-1	oil burner service	2 buildings: 2-story office building, built in 1941; and 1-story warehouse building, built 1953; both hot water heat	N85	Low	PET	x		x	x	x		x	
30.1	30.1-1	gas station	1-story office & warehouse building, forced air heat, built in 1919.	N77	Moderate	GAS			x	x				
30.1	30.1-3	gas station and auto repair	(Lots 3-6) 3 commercial buildings: 1-story warehouse, built in 1946, no heat; 1-story factory, built in 1945, no heat; 1-story warehouse, built in 1926, space heaters	N78, N83, N84	Moderate	GAS	x	xx	x	xx	x	xx	x	xx
30.1	30.1-4	paint products, floor factory	(Lots 3-6) 3 commercial buildings: 1-story warehouse, built in 1946, no heat; 1-story factory, built in 1945, no heat; 1-story warehouse, built in 1926, space heaters	N78, N83, N84	Low	SOLV	x		x		x		x	
30.2	30.2-1	gas station and auto repair	vacant land	N208	Moderate	GAS			x					
30.3	30.3-3	sign company	vacant land	N209	Moderate	SOLV			x				x	

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)	Tunnel Alternative - Side-by-Side Tunnel	Elevated Structure with Reconfigured Whatcom Railyard	Elevated Structure with Relocated Whatcom Railyard				
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP
30.3	30.3-4	gas station and auto repair	vacant land		Moderate	GAS		x				x		
40.1	40.1-1, -3, -5	machine shop, auto repair, sports facility	(Entire Block) Sports Facility	N56	Moderate	SOLV, MET, PET	x		x		x		x	
40.1	40.1-4	paint removing	(Entire Block) Sports Facility		High	SOLV	x		x		x		x	
40.1	40.1-2	gas station	vacant land	N211	Moderate	GAS	x		x		x		x	
40.2	40.2-3	gas station	parking lot	N210	Moderate	GAS			x					
50.1	50.1-1	cleaners	parking lot	N55	High	SOLV	x		x		x		x	
50.1	50.1-2	cleaning supply company	parking lot		High	SOLV	x		x		x		x	
50.1	50.1-3	auto repair	parking lot		Low	PET	x		x		x		x	
50.2	50.2-4	food products	2-story industrial light manufacturing building, built 1900, hot water heat	N66	Low	PET			x					
60.3	60.3-1	hotel	1-story cleaning plant & laundry, built 1946, steam heat/oil burner; replaced by 3-story motel, built 1961, electric heat	N54	High	SOLV, GAS	x	x	x	x	x	x	x	
70.4	70.4-1	cleaners, laundry	5-story motel building, built 1959, hot water heat	N52	High	SOLV	x	x	x	x	x	x	x	
80.5	80.5-1	restaurant	1-story convenience store with gas station, built 1998, heat pump	N51	Moderate	GAS			x	x				
80.6	80.6-2, -3	gas station	(Lots 7 - 11) parking lot	N214	Moderate	GAS	x		x		x		x	
80.6	80.6-4	auto repair, gas station	1-story auto repair garage, built 1961, space heaters	N60	Moderate	PET	x		x	x	x		x	
130.9	130.9-1	gas station	parking lot (vacant land)	C201	Moderate	GAS			x					
140.8	140.8-2	newspaper	3-story office, built 1947, complete HVAC heat	C119	Moderate	SOLV				x				
140.9	140.9-1	gas station & auto repair	parking lot (vacant land)	C122, C202	Moderate	PET, GAS			xx					
141.1	141.1-1	car wash	Car Wash (no details on buildings)	C120	Low	GAS			x	x				
141.2	141.2-1	service station	parking lot (vacant land)	C121	Moderate	GAS, PET			x					

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)		Tunnel Alternative - Side-by-Side Tunnel		Elevated Structure with Reconfigured Whatcom Railyard		Elevated Structure with Relocated Whatcom Railyard	
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP
150.4	150.4-2	printing company, film processing	2 stories, built 1937, radiant hot water heat	C88	High	SOLV	x	x	x	x				
150.7	150.7-2	fire station	2-story fire station, built 1922, space heaters	C140	Low	PET		x				x		x
160.3	160.3-2	wagon and carriage	parking lot	S200	Moderate	MET	x		x		x		x	
190.2	190.2-1	gas station	Pike Place Market Park	S220	Moderate	GAS	x		x		x		x	
190.2	190.2-2	auto repair	Pike Place Market Park	S220	Low	PET	x		x		x		x	
190.2	190.2-3	printers	Pike Place Market Park	S220	Moderate	SOLV	x		x		x		x	
190.2	190.2-4	gas station, metal plating	No records available	S221	Moderate	MET, GAS	x		x		x		x	
220.2	220.2-1		2-story retail/apartments/ storage, built 1925 /condo?	S35	Moderate	SOLV, MET, PET	x		x		x		x	
230.2	230.2-1	power company	2-story industrial light manufacturing (built 1900) and 1-story storage warehouse (built 1918)	S204	High	PET	x	x	x	x	x	x	x	x
240.2	240.2-1	marine supply	6-story office, built 1918	S205	High	SOLV, MET, GAS	x		x		x		x	
240.2	240.2-2	multi-use building	offices, built 1910, heat pump; utility & railroad right-of-way	S206	Low	MET, PET	x		x		x		x	
260.2	260.2-1	mixed use building	13-story condominium building, built 1983, complete HVAC	S27	Low	MET	x		x		x		x	
270.2	270.2-1	printing co., chemical co.	5-story office/retail, built 1910, heat pump	S26	High	SOLV	x		x		x		x	
270.2	270.2-2	tailors and cleaners	5-story office/retail, built 1910, heat pump		High	SOLV	x		x		x		x	
270.2	270.2-3	Engine Company	5-story office/retail, built 1910, heat pump		Low	PET	x		x		x		x	
270.2	270.2-4	motor car company	5-story office/retail, built 1910, heat pump		Low	PET	x		x		x		x	
270.2	270.2-5	cleaners	5-story office/retail, built 1910, heat pump		High	SOLV	x		x		x		x	

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)	Tunnel Alternative - Side-by-Side Tunnel	Elevated Structure with Reconfigured Whatcom Railyard	Elevated Structure with Relocated Whatcom Railyard			
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP	
280.2	280.2-1,- 2,-3	lithograph and printers	parking garage (not impacted- S23)	S208	High	SOLV, GAS	x		x		x		
280.2	280.2-4	Parking Facility	3-story office building, built 1906, steam without boiler	S24, S25	Moderate	GAS	x		x		x		
290.2	290.2-1	printers	6-story office, built 1910, steam heat without boiler	S22	Low	SOLV	x		x		x		
290.2	290.2-2	ink mfr.	6-story office, built 1910, steam heat without boiler		Low	SOLV	x		x		x		
290.2	290.2-3	engineer company	6-story office, built 1910, steam heat without boiler		Low	PET, GAS	x		x		x		
290.2	290.2-5	warehouse	One 6-story warehouse storage building built 1910, steam without boiler.	S21	Low	GAS, MET	x		x		x		
350.1	350.1-1	repair workshop	Pier 46 terminal (marine/commercial/fish) - 4 buildings: 1) 2-story transit warehouse/gate/guardhouse, built 1967, warmed and cooled air; 2) office building, built 1967, warmed and cooled air; 3) transit warehouse/transit shed, built 1967, space heaters; 4) storage warehouse/maintenance, built 1967, space heaters	Terminal 46	Low	GAS, PET	x		x		x		x
350.1	350.1-2	gas station	Pier 46 -see above		Moderate	GAS	x		x		x		x
350.1	350.1-3	welding	Pier 46 -see above		Low	MET	x		x		x		x
350.1	350.1-4	gas station	Pier 46 -see above		Low	GAS	x		x		x		x
350.1	350.1-5	plating & machine shop, sheet metal works	Pier 46 -see above	Terminal 46	High	SOLV, MET	x		x		x		x
360.1	360.1-1	plating works, boiler works, brass foundry, tin shop, blacksmith, machine shops, gas & oil	Pier 46 -see above	Terminal 46	High	SOLV, MET, GAS, PET	x		x		x		x

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)		Tunnel Alternative - Side-by-Side Tunnel		Elevated Structure with Reconfigured Whatcom Railyard		Elevated Structure with Relocated Whatcom Railyard	
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP
360.1	360.1-2	copper works, machine shop	Pier 46 -see above	Terminal 46	Low	SOLV, MET	x		x		x		x	
360.1	360.1-3	sheet metal works, gas station, brass foundry, boiler works, plating works, machine shop	Pier 46 -see above		High	SOLV, MET	x		x		x		x	
360.1	360.1-4	dock	Pier 46 -see above		Low	PET	x		x		x		x	
360.1	360.1-5	machine shop, gas & oil, repair shop	Pier 46 -see above		Moderate	SOLV, MET, GAS	x		x		x		x	
360.1	360.1-6	railroad	Pier 46 -see above		High	SOLV, MET	x		x		x		x	
360.1	360.1-7	repair shop	Pier 46 -see above		High	MET, PET	x		x		x		x	
360.1	360.1-8	gasoline and service station	Pier 46 -see above		Moderate	GAS	x		x		x		x	
360.1	360.1-9	construction and dry dock company	Pier 46 -see above		High	SOLV, PET, MET	x		x		x		x	
360.1	360.1-10	machine & steel shops, oil house	Pier 46 -see above		High	SOLV, PET, MET	x		x		x		x	
360.1	360.1-11	boat shop	Pier 46 -see above		Moderate	PET, MET	x		x		x		x	
360.1	360.1-12	locomotive repairing	Pier 46 -see above	Terminal 46	Moderate	PET, MET	x		x		x		x	
360.15	360.15-1	sheet metal works	three-story industrial, built 1921; surface parking lot	S1, S212	High	PET, MET	x	x	x	x	x	x	x	x
380.1	380.1-1	Pier 37/Gasoline Station	Pier 46- see above	Terminal 46	High	GAS, PET, MET, SOLV	x		x		x		x	
380.1	380.1-2	junk company	Pier 46- see above		Moderate	PET, MET, PCBs	x		x		x		x	
380.1	380.1-3	coal briquette plant	Pier 46- see above		Moderate	GAS, PET	x		x		x		x	
380.1	380.1-4	automotive service (Terminal 37)	Pier 46- see above		Moderate	GAS	x		x		x		x	
380.1	380.1-5	Terminals 37, 42 ,47	Pier 46- see above		Low	PET	x		x		x		x	
380.3	380.3-3	truck sales & service	2-story warehouse, built 1938, space heaters	S52, S53, S54	Moderate	GAS	x		x		x		x	

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)	Tunnel Alternative - Side-by-Side Tunnel	Elevated Structure with Reconfigured Whatcom Railyard	Elevated Structure with Relocated Whatcom Railyard			
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP	
390.1	390.1-1	warehouse	Pier 46- see above	Terminal 46	Low	SOLV, MET, GAS	x		x		x		
390.1	390.1-2	gas station	Pier 46 -see above		Moderate	GAS	x		x		x		
390.1	390.1-6	blacksmith shop	Pier 46 -see above	Terminal 46	Low	MET	x		x		x		
<b>RELOCATION OF WHATCOM RAILYARD</b>													
390.2	390.2-1	railroad repair shop	warehouse (shed) Railroad	SIG Yard	Low	PET	x		x		x		x
410.1	410.1-1	Terminal 30	Port Terminal 30	Terminal 30	Moderate	PET			x				x
410.1	410.1-2	gas station			Moderate	GAS				x			
410.2	410.2-1	oil tank, railroad	railroad operating property - commercial rail terminal	SIG Yard	Moderate	PET			x				x
410.2	410.2-2	railroad repair shop	railroad operating property - commercial rail terminal	SIG Yard	Moderate	PET			x				x
410.2	410.2-3	railroad, tank	railroad operating property - commercial rail terminal		Moderate	PET				x			
410.2	410.2-4	railroad repair shop, blacksmith	railroad operating property - commercial rail terminal	SIG Yard	Moderate	MET			x				x
410.2	410.2-5	railroad machine shop, power house, storage tank, garage	railroad operating property - commercial rail terminal		Moderate	SOLV, MET, PET				x			
410.2	410.2-6	railroad oil shed	railroad operating property - commercial rail terminal		Moderate	PET			x				x
430.1	430.1-1	chemical mfr.	Terminal 30, 1-story government	Terminal 30	Moderate	PET, SOLV			x				x
430.1	430.1-3	gas station	building, passenger terminal, built 2003, complete HVAC	- see Block 410.1	Moderate	GAS			x				x
430.1	430.1-5	railyard dock			Moderate	SOLV				x			
430.1	430.1-6	gas station	Terminal 30	Terminal 30	Moderate	GAS			x				x
430.1	430.1-7	Pier 28	Terminal 30	Terminal 30	Low	PET			x				x
430.1	NA			Terminal 30	Not Ranked				x				x
430.2	430.2-1	railroad oil house, railroad car repair	Railway company operating terminal	SIG Yard	Moderate	PET			x				x
430.2	430.2-2	railyard carpenter and paint shop	Railway company operating terminal		Low	SOLV				x			

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)	Tunnel Alternative - Side-by-Side Tunnel	Elevated Structure with Reconfigured Whatcom Railyard	Elevated Structure with Relocated Whatcom Railyard			
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP	
440.1	440.1-1	railroad	Railway company rail terminal- 4 structures (see block 450.1 for details)	SIG Yard	Low	PET		x				x	
460.2	460.2-2	food warehouse	one-story warehouse, built 1952	S73	Moderate	PET		x	x			x	x
<b>Railroad Parcels (not a specific site*)</b>													
380.2	NA	railroad	RR ROW	S214	Low		x		x		x		x
380.2	NA	railroad	RR ROW	S215	Low		x		x		x		x
400.2	NA	railroad	RR ROW	SIG Yard	Low		x						x
450.1	450.1-1	BNRR	RR ROW	S131	Moderate	PET			x				x
<b>Facilities (Parcels or Buildings) with No Specific Site (not ranked)</b>													
1.09	NA		Crest Manor	N98	Not Ranked				x				
1.09	NA		Apt. Building	N99	Not Ranked				x				
1.1	NA		vacant	N204	Not Ranked				x				
10.1	NA		parking lot	N95	Not Ranked		x		x		x		x
20.05	NA		vacant	N155	Not Ranked				x				
20.05	NA		vacant	N206	Not Ranked				x				
20.05	NA		vacant	N207	Not Ranked		x		x		x		x
20.05	NA		2-story apartment building built 1909 and 2-story restaurant built 1953	N86, N86.5	Not Ranked				x	xx			
20.1	NA		701 Dexter Bldg.	N79	Not Ranked		x				x		x
40.2	NA		4-story office building, built 1920	N67	Not Ranked				x	x			
60.3	NA		1-story restaurant, built 1964	N53	Not Ranked		x	x	x	x	x	x	x
70.4	NA		parking lot	N213	Not Ranked		x		x		x		x
140.6	NA		office building, built 1978	C117	Not Ranked				x		x		x
150.3	NA			C81	Not Ranked		x		x		x		x
150.4	NA		retail, built 1930	C93	Not Ranked					x			
150.6	NA			C200	Not Ranked				x				
160.1	NA		railroad	S222	Not Ranked		x		x		x		x
190.5	NA			Pier 63/62	Not Ranked		x		x		x		x
220.2	NA		Market Square	S33	Not Ranked		x		x		x		x
230.1	NA		Bay Pavilion	Pier 57	Not Ranked		x		x		x		x

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)	Tunnel Alternative - Side-by-Side Tunnel	Elevated Structure with Reconfigured Whatcom Railyard	Elevated Structure with Relocated Whatcom Railyard				
							PSI	ACBM/ LBP	PSI	ACBM/ LBP	PSI	ACBM/ LBP		
240.1/ 250.1	NA		Elliott's Oyster House	Pier 56/55			x		x		x			
270.1	NA			Pier 53/52	Not Ranked		x		x		x			
380.1	NA		USCG Museum and USCG Office Bldg	T 36	Not Ranked			xx		xx		xx		
450.1	NA		building 1) one to two stories, built in 1952; Building 2) one story building 1957, garage, service repair	S72	Not Ranked				x	x			x	x
<b>Old Sites That Have Been Removed from Exhibit 6-3</b>														
320.1	320.1-1	clothes cleaner and dyers	three-story office, built 1911	S19	Moderate to High	SOLV								
370.1	370.1-1	gas station	warehouse, built 1939	S50	Low	GAS								
460.2	NA		one-story office building built 1959	S74	Not Ranked									
460.2	NA		one-story office building built 1957	S75	Not Ranked									
460.2	460.2-1	aluminum stripping	five buildings: 1) built 1971; 2) built 1956; 3) built 1955; 4) built 1951 - all one-story industrial buildings; 5) built in 1999, one- story storage warehouse	S142	Low	MET								
470.2	470.2- 1,2,3	brass foundry, wholesale paints	maintenance shop - Two buildings: 1) one-story garage/ maintenance shop, built 1959; 2) one-story garage, built 1976	S76	High	SOLV, MET, PET								
470.2	470.2- 1,2,3	brass foundry, wholesale paints		S77	High	MET, PET								
470.2	470.2-4	foundry		S141	High	MET								
470.2	included above		right-of-way utility road		Not Ranked									
470.25	NA		warehouse, built 1949	S78	Not Ranked									
470.25	NA		warehouse, built 1952	S79	Not Ranked									
470.25	NA		building, built 1952	S80	Not Ranked									
470.25	470.25-2	trucking company	one-story storage building, built 1983	S84	High	SOLV, PET								

Exhibit 6-3. Properties of Concern (continued)

Block No.	Site No.	Type of Business/ Reference Name	Current Tax Assessor Records	Bldg No.	Rank	Potential/ Known Contaminants	Tunnel Alternative - Stacked Tunnel (Preferred)	Tunnel Alternative - Side-by-Side Tunnel	Elevated Structure with Reconfigured Whatcom Railyard	Elevated Structure with Relocated Whatcom Railyard
							ACBM/ LBP	ACBM/ LBP	ACBM/ LBP	ACBM/ LBP
470.25	470.25-1	crane company	one-story warehouse, built 1964	S140	Low	MET				
470.25	NA		one-story masonry warehouse	S139	Not Ranked					
470.25	470.25-1	vacant lot	vacant lot		Low	MET				
470.25	NA		railroad right-of-way utility road		Low					
480.6	480.6-2	machine works	two one-story buildings: office building, built 1920; machine shop, built 1957	S95	High	SOLV, MET				
480.6	480.6-1	iron works, foundry	one-story foundry building, built 1918	S96	High	MET, PET				
460.2	NA	railroad	railroad right-of-way		Low					

Notes:

PET = petroleum  
 MET = metals  
 SOLV = solvents  
 GAS = gasoline  
 PCBs = polychlorinated biphenyls  
 PAHs = polycyclic aromatic hydrocarbons  
 RR ROW = railroad right-of-way

not ranked = site is not identified as having potential contaminants based on historic use or federal or state databases  
 x = PSI or ACBM or LBP survey recommended  
 \* although not identified as a site, all railroad right-of-way have a potential for petroleum  
 LBP = lead-based paint  
 ACBM = asbestos-containing building material  
 PSI = preliminary site investigation

### 6.3 Worker and Public Health and Safety Concerns

Issues related to worker public health and safety issues are the same as described in the 2004 Draft EIS Appendix U (Section 6.3). Demolition activities associated with the structures could expose workers and the surrounding public to asbestos and/or lead (from lead-based paint), if present. For properties that would be acquired or modified, a summary of recommended surveys for asbestos-containing building material and lead-based paint is presented in Exhibit 6-3.

### 6.4 Tunnel Alternative (Preferred Alternative)

The Tunnel Alternative includes a combination of aerial structures, cut-and-cover tunnels, retained cut sections, and at-grade roadways to replace the existing viaduct. These features were considered in the Draft EIS; however, revisions have been made to the configurations and extent of project elements. The updated Tunnel Alternative includes two alignments for the central area, a stacked tunnel (preferred alignment) and a side-by-side tunnel. The SR 99 alignment options would extend over or under Elliott and Western Avenues. In the south, the Whatcom Railyard could be relocated or reconfigured. In the north, Aurora Avenue N. would be lowered with either the Partially Lowered Aurora Option (paired with the preferred alignment) or the Lowered Aurora Option. Revised descriptions of the proposed features of the Tunnel Alternative are presented in the following sections.

The alignment of the various structures has been revised. Refer to the 2004 Draft EIS Appendix U (Chapter 6) for construction impacts related to groundwater, fill embankments, utilities, foundations, and soil improvement.

Construction impacts that could arise if contaminated soil and/or groundwater were encountered during construction activities are described at the beginning of this chapter. For the stacked tunnel alignment (the preferred alignment), an estimated 2,567,000 cy of material would be excavated or generated as spoils. The estimated volume of material to be excavated includes Holocene deposits, spoils, rail ballast, ties, and obstructions (such as wood piles). Slightly less than three quarters of that material (an estimated 1,866,000 cy) could be considered potentially contaminated or could require special handling. For the side-by-side tunnel alignment, an estimated 3,316,000 cy of material would be excavated or generated as spoils. Approximately three-quarters of the material (an estimated 2,532,000 cy) could be considered potentially contaminated or could require special handling.

Within the project corridor, 650 sites were identified that could impact the Tunnel Alternative and have the potential to contain or create hazardous materials. Of these sites, 351 sites are located adjacent to the Tunnel and Elevated Structure Alternatives; the remainder are located sufficiently close to be considered potential sources of contamination that could affect the project. An additional 10 sites could affect the side-by-side tunnel alignment. For the stacked tunnel alignment, 84 sites, 13 buildings, and a loading dock would be either modified or acquired. For the side-by-side tunnel alignment, 116 sites, 28 buildings, and a loading dock would be either modified or acquired.

If the Whatcom Railyard is relocated, an additional 18 sites and 1 building could impact the project as a result of potential contamination. In addition, several other properties that do not have any current or historical land use indicating the use of hazardous materials would be acquired for both alternatives.

Construction impacts could result from the demolition of structures acquired by WSDOT. For discussion purposes and to aid in locating the sites, city blocks within the corridor have been numbered as shown in Exhibit 4-1.

#### **6.4.1 South – S. Spokane Street to S. Dearborn Street**

Construction impacts are presented in the 2004 Draft EIS Appendix U (Section 6.6.1).

##### **Reconfigured Whatcom Railyard**

The ballast and shallow soil under the rails in the railyard are most likely contaminated with petroleum hydrocarbons. To the extent that this material is disturbed, additional contaminated material could be generated.

##### **Option: Relocated Whatcom Railyard**

An additional 18 potentially contaminated sites in the Whatcom Railyard and Terminal 30 would be impacted under this option compared to the Reconfigured Whatcom Railyard. The volume of potentially contaminated ballast and shallow soil would be greater if the Whatcom Railyard was relocated.

##### **Properties of Concern**

The Tunnel Alternative alignment modifications have resulted in a change of properties that would be affected and are of concern.

The Terminal 46 property encompasses Blocks 350.1, 360.1, 380.1, and 390.1 and extends from S. Jackson Street to S. Massachusetts Street, as discussed for the Rebuild Alternative in the 2004 Draft EIS Appendix U (Section 6.4.3).

Other sites of concern not previously identified as properties of concern for either the Tunnel or the Elevated Structure Alternative are located on Block 380.3. Three businesses operated on Block 380.3: a cleaning products company, a junk company, and a truck sales and service company. The junk company, because of the unknown type of junk, is considered to be substantially contaminated and could pose a high risk to the project. The truck sales company is considered to be reasonably predictable and would pose a moderate risk because gas tanks were present on the site.

Blocks that are of concern if the Whatcom Railyard is relocated include Blocks 410.2, 430.2, 440.1, and 450.1, as discussed for the Rebuild Alternative in the 2004 Draft EIS Appendix U (Section 6.4.3). Blocks 410.1 and 430.1 would also be properties of concern; they were not identified in the 2004 report.

Blocks 410.1 and 430.1 are part of Terminal 30 (formerly known as Pier 32). A bulk oil facility operated here from 1913 or earlier until 1984. A plume of free product was discovered in the early 1980s. A product recovery system was installed and operated until 1992. Most of the petroleum contamination occurred in the middle to western portions of the property; contaminants also included metals and cyanide. The entire site is now paved, with a monitoring program in place. A former retail service station was also located at this site, built in 1950 (Site 410.1-2). Records indicate that it had three USTs. The sites are considered to be a moderate risk to the project. A mitigating factor is that known contamination has been remediated.

#### **6.4.2 Central – S. Dearborn Street to Battery Street Tunnel**

The revisions in the Tunnel Alternative primarily relate to the alignment and dimensions of the structures. In general, most of the impacts related to hazardous materials were identified in the 2004 Draft EIS Appendix U (Section 6.6.2).

##### **Stacked Tunnel Alignment with SR 99 Under Elliott and Western**

The roadway would be at grade from S. Royal Brougham Way to about 600 feet to the north. From this point and extending about 800 feet farther to the north, the roadway would consist of four lanes and descend into a retained cut section with its sides supported by diaphragm walls. Ramps on either side of the retained cut section would start as elevated structures near S. Royal Brougham Way and extend down into retained cuts as they lower to join the alignment grade near the south portal of the tunnel, about 850 feet south of S. King Street.

At the south portal, the structure would transition to a side-by-side, six-lane, cut-and-cover tunnel, but then the northbound lanes would transition

alongside and then under the southbound lanes until the roadway forms a stacked tunnel from S. Main Street to Seneca Street. Construction of the stacked tunnel would require excavation to a depth of approximately 70 feet. From the south portal to about Yesler Way, the tunnel would shift toward the west until meeting the existing seawall north of Yesler Way. Between S. Washington Street and Yesler Way, the west wall for the cut-and-cover tunnel would extend about 42 feet beyond the existing seawall into Elliott Bay. From Yesler Way to about Union Street, the new cut-and-cover tunnel would serve as the replacement for the seawall.

At Spring Street, the tunnel would begin to transition as the northbound lanes move toward the east until they are next to the southbound lanes, and then they would ascend to a side-by-side alignment at the north portal near Pine Street. A mechanically stabilized earth (MSE) wall would support a portion of the north portal. Vent structures would be constructed in the vicinity of the south and north portals and in the locations previously assessed in the 2004 Draft EIS Appendix U. No access ramps would be provided in this area.

Between the north portal at Pine Street and Virginia Street, the cut-and-cover roadway would transition to an aerial structure. Large-diameter drilled shafts would support the aerial structure. The roadway would touch down to the current ground surface near Virginia Street and transition to a retained cut section extending below Elliott Avenue and Western Avenue. The sides of the retained cut section would be supported by retaining walls that could consist of tied-back walls or diaphragm walls, depending on the depth. A southbound on-ramp would extend on an elevated structure from Elliott Avenue to the north portal. A northbound off-ramp would extend from the retained cut section up to Western Avenue in a retained cut. The stacked tunnel alignment could also be paired with the option to extend the roadway between Pine Street and the Battery Street Tunnel on aerial structures over Elliott and Western Avenues, as outlined in the next section.

Construction impacts for the stacked tunnel would be the same as those discussed for the Aerial (Section 6.5) and Tunnel (Section 6.6) Alternatives included in the 2004 Draft EIS Appendix U.

#### **Side-by-Side Tunnel Alignment with SR 99 Over Elliott and Western**

The roadway south of the south portal of the tunnel would be the same as that discussed for the stacked tunnel above.

The side-by-side cut-and-cover tunnel would extend from about 850 feet south of S. King Street to about Pine Street and would require excavation of soil to a depth of approximately 60 feet. Diaphragm walls would be used to support the sides of the tunnel. From the south portal to about Yesler Way,

the tunnel would shift toward the west until meeting the existing seawall north of Yesler Way. Between S. Washington Street and Yesler Way, the west wall for the cut-and-cover tunnel would extend about 53 feet beyond the existing seawall into Elliott Bay. From Yesler Way to about Union Street, the outer wall of the new cut-and-cover tunnel would serve as the replacement for the seawall.

Since the east half of the cut-and-cover tunnel would be located under the existing viaduct alignment, the tunnel would be constructed in two phases so that traffic through the area could be maintained. The north portal of the cut-and-cover tunnel would be located near Pine Street. An MSE wall would support a portion of the north portal. Vent structures would be constructed in the vicinity of the south and north portals and in the locations previously assessed in the 2004 Draft EIS Appendix U. No access ramps would be provided in this area.

Between Pine Street and the Battery Street Tunnel, the cut-and-cover roadway transitions to an aerial structure connecting to the Battery Street Tunnel. The construction of the aerial structure would require cuts into the existing hillside below the viaduct. These cuts would be supported by retaining walls with or without tiebacks extending under the existing viaduct. A southbound on-ramp would extend on an elevated structure from Elliott Avenue to the north portal. A northbound off-ramp would extend on an elevated structure from the north portal to Western Avenue. Large-diameter drilled shafts would support the aerial structure and ramps south of the Battery Street Tunnel. The side-by-side tunnel alignment could also be paired with the option to extend the roadway between Pine Street and the Battery Street Tunnel in a retained cut under Elliott and Western Avenues, as outlined in the next section.

Construction impacts for the side-by-side tunnel alignment would be the same as those discussed in the 2004 Draft EIS Appendix U for the Tunnel Alternative (Section 6.6).

#### Properties of Concern

The following sites are additional properties of concern for the Tunnel Alternative. Summaries of other properties are presented in the 2004 Draft EIS Appendix U (Section 6.6.2).

Petroleum and metal contamination were documented on Block 240.2. Although some remediation has been completed, the source of the contamination and the distribution of remaining contaminants are not known. Therefore, the site is considered to be substantially contaminated and poses a high risk to the project.

A steam plant operates on Block 230.2. Petroleum is known to have leaked and has been encountered in the right-of-way at the west edge of the property. The contamination may be widespread; consequently, the site is considered to be substantially contaminated and poses a high risk to the project. A gas station formerly operated on the block, and that site is considered to be reasonably predictable and poses a moderate risk to the project.

Block 190.2 was historically occupied by an auto repair shop (Site 190.2-2), two gas stations (Site 190.2-1 and Site 190.2-4), a printing business (Site 190.2-3), and a metal plating facility (Site 190.2-4). The auto repair shop is considered reasonably predictable and a low risk to the project. The gas station and printers are considered reasonably predictable but a moderate risk to the project. Due to the potential for substantial contamination, the metal plating facility is considered substantially contaminated and is a moderate risk to the project.

#### **6.4.3 North Waterfront – Pine Street to Broad Street**

Construction activities in the north waterfront would be primarily related to the seawall. The seawall would end at approximately Broad Street rather than extending to Myrtle Edwards Park as described in the Draft EIS. Impacts from the fill, former wood-plank road, and former railroad trestles along the waterfront and historic site uses are discussed in the 2004 Draft EIS Appendix U (Sections 6.4.5 and 6.4.7).

#### **Properties of Concern**

No additional properties of concern have been identified.

#### **6.4.4 North – Battery Street Tunnel to Comstock Street**

The 2004 Draft EIS Appendix U did not include major revisions to the Battery Street Tunnel, but only a fire and life safety upgrade. Along with the fire and life safety improvements, the updated Tunnel and Elevated Structure Alternatives would also lower the tunnel floor to provide 16.5 feet of vertical clearance for the entire length of the Battery Street Tunnel. The Tunnel Alternative also includes the option to widen the curves at the north and south portals of the Battery Street Tunnel. Impacts for revisions to the Battery Street Tunnel would be similar to the impacts identified for the cut-and-cover tunnel. Former gas stations were located near the portal, and subsurface soils may be contaminated with gasoline. A discussion of impact is provided for the Aerial Alternative in the 2004 Draft EIS Appendix U (Section 6.5).

The Tunnel Alternative included in the Draft EIS included widening Mercer Street. For the updated Tunnel Alternative, the stacked tunnel alignment (preferred alignment) includes the Partially Lowered Aurora Option. From the north portal of the Battery Street Tunnel, SR 99 would descend into a retained cut extending under Thomas and Harrison Streets. Two new overpasses would be constructed to reconnect the surface streets at these locations. Aurora Avenue N. would cross over Mercer Street, and Mercer Street would be widened. In addition, Roy Street would be regraded to connect to SR 99.

The side-by-side tunnel alignment is paired with the Lowered Aurora Option, which would have SR 99 descend from the north portal of Battery Street Tunnel into a retained cut extending under Thomas, Harrison, Republican, Mercer, and Roy Streets. Five new overpasses would be constructed to reconnect the surface streets at these locations. New on-ramps and off-ramps would be constructed at Republican Street, Denny Way, and Roy Street. In addition, the existing depressed Broad Street roadway would be backfilled between Fifth Avenue N. and Dexter Avenue N. Since these features are similar to those included in the Draft EIS for the Aerial Alternative, the impacts discussed for the Aerial Alternative in the 2004 Draft EIS Appendix U are applicable to the Tunnel Alternative in the area north of the Battery Street Tunnel (Section 6.5.4).

The Lowered Aurora Option includes rebuilding Sixth Avenue N. along the west side of SR 99 from Harrison Street to Roy Street. The street would be built along the existing grade and would extend over the filled area of Broad Street. Impacts are discussed in the Aerial Alternative of the 2004 Draft EIS Appendix U (Section 6.5.4). In addition to potentially impacting the right-of-way because the current alignment crosses the former gasoline stations and dry cleaning operations, there would be a high potential to encounter contaminants in the soil excavated to lower Aurora Avenue N. A dry cleaning solvent release has been documented on one site, and low levels of solvents and compounds found in gasoline were encountered in the right-of-way in this area.

#### Properties of Concern

The following sites are additional properties of concern for the Tunnel and Elevated Structure Alternatives.

A retail building (C88) that is located on Block 150.4 may be acquired or modified for the project. No hazardous materials were identified on this property; however, because the building was constructed in 1930, it has the potential to have asbestos-containing building material and lead-based paint.

An office building (C117) located on Block 140.6 may be acquired or modified for the project. No hazardous materials were identified on this property; however, because the building was constructed in 1978, it has the potential to have asbestos-containing building material.

Gas stations were formerly located on Sites 80.6-2 and 80.6-3. These sites are reasonably predictable but are considered a moderate risk to the project due to the potential to encounter widespread contamination on these sites.

A dry cleaners and laundry formerly operated on Site 70.4-1. A dry cleaning UST was noted on this site on a Sanborn map. The site is considered substantially contaminated and a high risk to the project because solvent contamination may be widespread on this property.

A restaurant (N53) located on Block 60.3 may be acquired or modified for the project. No hazardous materials were identified on this property; however, because the building was constructed in 1964, it has the potential to have asbestos-containing building material and lead-based paint.

Site 60.3-1 was historically occupied by a dry cleaner and a gas station. Dry cleaning solvents (TCE and PCE) have been documented in soil and groundwater at this site. The site is considered a high risk to the project due to the potential to encounter known solvent and gas contamination on the site.

Site 50.1-1 was occupied by a former dry cleaner, and Site 50.1-2 was occupied by a dry cleaning supplies and laundry dyes store, a furniture repair and upholstery shop, and a spray painting company. Because of the former use and/or storage of solvents on both of these sites, they are considered substantially contaminated and pose a high risk to the project.

An auto repair shop historically occupied Site 50.1-3. There is a reasonably predictable potential for petroleum contamination at this site, posing a low risk to the project.

Site 40.2-3 was formerly occupied by a gas station. This site is considered reasonably predictable and a low risk to the project.

An office building (N67) located on Block 40.2 may be acquired or modified for the project. No hazardous materials were identified on this property; however, because the building was constructed in 1920, it has the potential to have asbestos-containing building material and lead-based paint.

Petroleum-contaminated soil was encountered on Block 40.1 during construction of the Sonics Training Facility. Affected soil was excavated and transported to the adjacent King County Metro Transit Bus Barn site. No assessment or cleanup was conducted. A machine shop, a gas station, an auto repair shop, and a paint removal company formerly occupied the block. Most

of the properties on this block are considered a moderate risk to the project because, although metals, gasoline, petroleum, and/or solvents contamination is reasonably predictable, there is a potential to encounter widespread contamination on these sites. Site 40.1-4 (a former paint removal company) is considered substantially contaminated. The site poses a high risk to the project because of the potential for substantial contamination by solvents.

Gasoline stations were located on Sites 30.1-1 and 30.1-3. A flooring company operated on Site 30.1-4. The gas station properties are considered a moderate risk to the project because petroleum contamination, if present, is considered reasonably predictable. The flooring company site is considered substantially contaminated and a moderate risk to the project because of potential solvent use.

An oil burner sales and service business operated on Site 30.05-1. This property is considered a low risk to the project because petroleum contamination, if present, is considered reasonably predictable.

The following sites are additional properties of concern for the side-by side tunnel alignment with the Lowered Aurora Option.

Sites 141.2-1, 130.9-1, and 80.5-1 and Block 140.9 were formerly occupied by gas stations. Gasoline contamination is reasonably predictable; however, these sites are considered a moderate risk to the project because of the potential to encounter widespread contamination on the sites.

A newspaper facility encompasses most of Block 140.8 (Site 140.8-2). The newspaper site is considered to be a high risk to the project because of the potential to encounter substantial solvent contamination.

Three USTs have been located on Site 50.2-4. One UST is closed in place, and the other two contain heating oil. There is a reasonably predictable potential for petroleum contamination at this site, posing a low risk to the project.

A sign company was located on Site 30.3-3, and a gas station formerly occupied Site 30.3-4. The potential for solvent contamination at the sign company property and gasoline contamination at the gas station property is reasonably predictable but is considered a moderate risk to the project.

Block 30.2 was formerly occupied by an auto electric business and gas station and auto repair shop. This property is considered reasonably predictable but a moderate risk due to the potential to encounter widespread gasoline contamination on this site.

Two buildings, an apartment building (N86) and a restaurant (N86.5), that are located on Block 20.05 may be acquired or modified for the project. No hazardous materials were identified on this property; however, because the

buildings were constructed in 1909 and 1953, respectively, they have the potential to have asbestos-containing building material and lead-based paint.

Block 10.05 was formerly occupied by a sign painting company and a gas station. The potential for solvent contamination at the former sign painting company is reasonably predictable based on a usage history of less than 20 years, and the site poses a low risk to the project. The former gas station site is considered a moderate risk to the project because petroleum contamination is considered reasonably predictable, but there is the potential to encounter widespread gasoline contamination on this site.

A printers and publications store formerly occupied Site 1.1-1. This property is considered a high risk to the project because solvent contamination could be widespread. This property is considered substantially contaminated.

#### **6.4.5 Seawall – S. Washington Street to Broad Street**

The Tunnel Alternative would include performing soil improvement (jet grouting or other soil improvement method) and replacing the face paneling for the seawall between S King and S. Washington Streets. The cut-and-cover tunnels between S. Washington Street and about Union Street would replace the seawall. The remainder of the seawall to the north would be replaced by using a gravity wall (L-Wall) and soil improvement. Drilled shafts, considered in the Draft EIS, will probably not be used. Soil improvement would be performed to replace and improve portions of the seawall in front of Pier 48 and Pier 66. Impacts would be similar to those discussed for the Rebuild Alternative in the 2004 Draft EIS Appendix U (Section 6.4.7).

### **6.5 Elevated Structure Alternative**

The Elevated Structure Alternative includes rebuilding the viaduct and seawall. The substantial changes to the alignment at the north end and the optional relocation of the Whatcom Railyard are the largest modifications to the alternative relating to hazardous materials. Revised descriptions of the proposed features and construction impacts of the Elevated Structure Alternative are presented in the following sections.

Approximately 1,313,000 cy of material would be excavated or generated as spoils if the Whatcom Railyard were reconfigured. Of this volume, it is anticipated that more than approximately three-quarters of that material (approximately 1,111,000 cy) could potentially be contaminated or require special handling. If the Whatcom Railyard were relocated, the volume of spoils would increase to approximately 1,407,000 cy, and of this volume, approximately 1,205,000 cy (roughly the same percentage) of soil could potentially be contaminated or require special handling. The volume of

material is greater than presented in the March 2004 Draft EIS because of modifications to the portals and lowering Aurora Avenue N. at the north end of the alignment.

Within the project corridor, 650 sites were identified that could affect the Elevated Structure Alternative and have the potential to contain or create hazardous materials. Of these sites, 351 are located adjacent to the Elevated Structure Alternative; the remainder are located sufficiently close to also be considered potential sources of contamination that could affect the project. Under the Elevated Structure Alternative with the Reconfigured Whatcom Railyard, 82 sites, 12 buildings, and a loading dock would be acquired or modified. Construction impacts could result from the demolition of structures acquired by WSDOT. Based on the ages of the buildings, asbestos-containing building material and lead-based paint are likely present. An additional 21 sites and 2 buildings would be affected if the Whatcom Railyard is relocated rather than reconfigured. In addition, several other properties that do not have any current or historical land use indicating the use of hazardous materials would be acquired for both alternatives.

#### **6.5.1 South – S. Spokane Street to S. Dearborn Street**

The same improvements discussed for the Tunnel Alternative are proposed in this area. Refer to Section 6.4.1 for a discussion of impacts.

##### **Properties of Concern**

Additional properties of concern are discussed in Section 6.4.1.

#### **6.5.2 Central – S. Dearborn Street to Battery Street Tunnel**

For this area, the Elevated Structure Alternative is similar to the Aerial Alternative that was described in the Draft EIS. The proposed roadway would be stacked and would generally follow the existing SR 99 alignment on an aerial structure. The new structure foundations would be constructed largely outside of the existing viaduct foundations to result in a wider structure. Large-diameter drilled shafts would likely be used to support the aerial structure. Soil improvement would be performed around each foundation south of S. Jackson Street. Elevated ramps, supported by drilled shaft foundations and with MSE wall approach fills, would be constructed to Columbia and Seneca Streets.

Impacts would be related to groundwater, fill embankments, utilities, foundations, soil improvement, and retaining walls. These impacts would be similar to those discussed for the Rebuild Alternative in the 2004 Draft EIS Appendix U (Section 6.4).

### Properties of Concern

Blocks 240.2, 260.2, and 270.2 would be additional properties of concern for the Elevated Structure Alternative and the Tunnel Alternative.

#### 6.5.3 North Waterfront – Pine Street to Broad Street

The same improvements discussed for the Tunnel Alternative are proposed in this area. Refer to Section 6.4.3 for a discussion of impacts.

### Properties of Concern

No additional properties of concern have been identified for the north waterfront area.

#### 6.5.4 North – Battery Street Tunnel to Comstock Street

The same retained cut configuration described in the Tunnel Alternative is included in the Elevated Structure Alternative. Construction impacts would be the same as those referenced in Section 6.4.4 for the Tunnel Alternative.

### Properties of Concern

Properties of concern are discussed in Section 6.4.4.

#### 6.5.5 Seawall – S. Washington Street to Broad Street

For the Elevated Structure Alternative, the existing seawall would be replaced by using a gravity wall (L-Wall) and soil improvement. The Draft EIS considered a drilled shaft structure that is no longer being considered. Soil improvement would be performed to replace and improve portions of the seawall in front of Pier 48 and Pier 66. Construction impacts would be similar to those discussed for the Rebuild Alternative in the 2004 Draft EIS Appendix U (Section 6.4.7).

## 6.6 Recommendations for Further Investigations

### 6.6.1 Site Reconnaissance

A full-access site reconnaissance is recommended for all properties of concern, as discussed in the 2004 Draft EIS Appendix U (Section 6.9.2). A site reconnaissance could cost between \$500 and \$1,500 depending upon site conditions, access, and the size of the property. The changes to the list of properties are identified in Exhibit 6-3.

## 6.6.2 Underground Storage Tank Site Assessments

UST site assessments should be conducted for all properties of concern where there is a potential for USTs. Historical information and any site features observed during the site reconnaissance should be used to identify the most likely location of USTs and underground heating oil tanks. A ground-penetrating radar (GPR) survey could also aid in identifying potential UST locations. The cost of GPR survey for a typical city parcel ranges between \$300 and \$700. Site investigation work to identify if there had been a release could be conducted in conjunction with the preliminary site investigations (PSIs). A UST assessment (no known release) could cost between \$1,500 and \$5,000 depending upon site conditions and access.

## 6.6.3 Preliminary Site Investigations

PSIs should be conducted at properties to be acquired by WSDOT and at the right-of-way adjacent to selected adjoining properties. PSIs should be conducted where there is a risk of contamination from past site operations or where contamination is known to exist, as discussed in the 2004 Draft EIS Appendix U (Section 6.9.3).

The changes to the list of recommended PSIs are summarized in Exhibits 6-3 and 6-4. Sites were removed from the tables because they are no longer relevant to the project or are no longer adjacent to the alignment. The following is a summary of the number of PSIs that are recommended for the project:

Alternative	Number of Recommended PSIs
Tunnel Alternative	
Stacked Tunnel Alignment (Preferred)	333
Side-by-Side Tunnel Alignment	343
Elevated Structure Alternative	
With Reconfigured Whatcom Railyard Option	333
With Relocated Whatcom Railyard Option	351

A PSI for a single parcel may address concerns for more than one site as identified in this report. Sites are identified by historical use, and parcel boundaries frequently changed through time, thus occasionally resulting in overlapping sites. More than one site may be associated with a parcel, and each historical use of potential hazardous materials should be evaluated within the parcel. The cost to conduct a PSI ranges from approximately \$8,000 to \$25,000 depending upon the scope of the investigation. Shallow geoprobes may be sufficient for most sites; however, in areas of dense soils or where contamination may be present deeper than 15 feet, borings or monitoring

wells may need to be installed to collect representative environmental samples.

#### 6.6.4 Additional Investigations

Site characterization or more extensive investigations may be necessary for sites that would be acquired, particularly if the PSI indicated that site contamination is present. Site characterization investigations could range from approximately \$15,000 to \$50,000, depending upon the potential types and distribution of contaminants.

#### 6.6.5 Asbestos-Containing Building Material and Lead-Based Paint Surveys

Changes to the list of properties for which asbestos-containing building material and lead-based paint surveys would be needed are summarized in Exhibit 6-3. The following is a summary of the number of asbestos-containing building material and lead-based paint surveys that would be required for the Tunnel and Elevated Structure Alternatives:

Alternative	Asbestos-Containing Building Material/ Lead-Based Paint Surveys
Tunnel Alternative	
Stacked Tunnel Alignment (Preferred)	19
Side-by-Side Tunnel Alignment	34
Elevated Structure Alternative	
With Reconfigured Whatcom Railyard Option	18
With Relocated Whatcom Railyard Option	20

Costs for asbestos/lead surveys could range between \$3,000 for small structures (residence) and \$20,000 for larger commercial/industrial structures.

Exhibit 6-4. Recommended PSIs for Adjacent Properties

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
New Sites That Have Been Added to Exhibit 6-4										
1.06	1.06-1	auto repair	1-story garage built in 1950, oil burner	auto repair	vacant land		North <sup>(1)</sup>	Low	RP	pet
1.06	1.06-2	auto repair, printers		auto repair, printers	11-story apartment building, built 1993, electric heat		North <sup>(1)</sup>	Low	RP	pet, solv
1.06	1.06-3	gas station, auto repair, sign manufacturer		gas station, auto repair, sign manufacturer	11-story apartment building, built 1993, electric heat/ vacant land		North <sup>(1)</sup>	Low	RP	gas, pet, solv
1.08	1.08-1	auto repair, gas station	1-story garage then recap shop, built 1946, stove	auto repair	1-story retail store, built 1946, forced air		North <sup>(1)</sup>	Low	RP	pet
1.08	1.08-2	outboard motor sales & service, gas station	new 1-story gas station replaced in 1960-61, tanks: 1-3,000 gallon & 1-280 gallon	outboard motor sales & service	1-story auto repair garage, built 1960, forced air		North <sup>(1)</sup>	Low	RP	pet/gas
1.08	1.08-3	delicatessen	new 1-story gas station replaced in 1955, tanks: 2-10,000 gallon & 1-550 gallon	gas station	1-story retail store, built 1952, forced air	Yes	North <sup>(1)</sup>	Low	RP	gas
10.2	10.2-1	school district	1-story warehouse, office, & shops, built 1920, oil burner heat	maintenance shop	2-story office building, built 1930, steam heat	Yes	North	Low	RP	gas
30.3	30.3-2	State of Washington/sign company	Vacant lot from 1959 to 1973		Industrial (General Purpose)		North	Moderate	SC	solv
30.3	30.3-4	gas station and auto repair	Gas station, built 1930, torn down 1956, stove heat		masonry building built in 1920		North	Moderate	RP	gas
40.05	40.05-1	bus maintenance	1-story bus barn & offices, built date not recorded, hot water/oil burner	bus repair shop with fueling & machine shop	no current buildings	Yes	North	Low	RP	solv, metals, pet
40.05	40.05-2	public utility		Substation & transformer house	no current buildings		North	Moderate	SC	pcbs
50.05	50.05-1	autobody works & repairing, paint room	1-story garage, built 1947, paint shop noted, oil burner, auto rebuild noted, torn down 1962	autobody works & repairing, paint room	Garage; masonry building built in 1947 and gymnasium constructed of prefabricated steel built in 1994		North	Low	RP	solv, pet
50.3	50.3-1	print shop	Built in 1928, listed as two-story re- conditioned factory with oil burner	printing	parking lot		North	Low	RP	solv
50.3	50.3-2	wood working / painting	2-story building, built 1928, steam heat	wood working / painting	2-story warehouse and office building, built 1928, forced air heat		North	Low	RP	solv

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
50.3	50.3-3	auto factory	Built in 1930, listed as single-story warehouse with two oil burners. Floor plans indicate building once used as masonry factory garage.		1-story warehouse, built 1930, forced air heat		North	Low	RP	solv, pet
130.8	130.8-1	dry cleaners, printer, auto repair	garage and storage, 2-stories, built 1949-50, 2-1000 gallon tanks listed, no heat listed	dry cleaners / printer	18-story apartment building, built 1949, hot water heat (site is located on undeveloped portion of property)		North <sup>(1)</sup>	Moderate	SC	pet/gas
151.1	151.1-1	automobile dealership	Used car lot, built 1950, torn down 1965; 1-story auto dealership, built in 1965 (service area, wash area, and hoist in drawing)	auto sales & service	1-story office building, built 1965, forced air heat	Yes	North	Low	RP	pet/gas
151.1	151.1-3	paints	1-story retail building, built 1943, stove heat, torn down 1952	paints	4-story hotel, built 1967, hot and chilled air		North	Low	RP	solv
210.2	210.2-1	retail and office building	7-story retail, loft, café built in 1915 with stove heat and suspended gas and 1 steam pipe	labels / printing	6-story retail/office, built 1915, heat pump.		Central, Seawall	Low	RP	solv
260.3	260.3-1	printing	6-story building (retail) constructed in 1905, covers entire block	printing	6-story department store, built 1905, steam heat		Central, Seawall	Low	RP	solv
280.2	280.2-1	printing/lithography company	Constructed 1906, 4-story commercial with steam heat	printers book & commercial	4-story parking garage, built 1906, no heat		Central, Seawall	High	SC	solv
280.2	280.2-2	Parking Facility	Constructed 1906, first floor of 4-story building described in 1936 as service station - "gasoline equipment" listed but no tanks listed	gas station	parking lot	Yes	Central, Seawall	Low	RP	gas
280.2	280.2-3	Parking Facility	half of printing building torn down to leave lot 4 with 1-story gas station built in 1942; stove heating, 3 pumps listed in 1967; tanks: 3-1000-gallon & 1-550-gallon	gas station			Central, Seawall	Low	RP	gas
320.1	320.1-1	clothes cleaners and dyers	3-story hotel/retail building, built 1911	clothes cleaners	3-story office, built 1911, electric wall heat; Hotel: 4-stories, built 1914, electric wall heat		Central, Seawall	High / Moderate	SC	solv
330.1	330.1-1	gas station		gas station	Pier 48 Victoria Line 2-story dock, built 1901		Central	Moderate	RP	gas
360.3	360.3-1	machine works, tool mfrs.	No Records Available		6-story office building, built 1910, warmed and cooled air		Central		RP	solv, metals

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
360.3	360.3-7	chemical co.	No Records Available		5-story office/retail warehouse, built 1910, electric wall heat		Central		RP	solv
360.3	360.3-8	printers	No Records Available		5-story office/retail warehouse, built 1910, electric wall heat		South	Low	RP	solv
370.1	370.1-1	gas station		gas station	2-story warehouse, built 1939, space heaters		South	Low	RP	gas
370.2	370.2-5	chemical mfrs.			2-story commercial office/warehouse building, built 1920, space heaters		South	Low	RP	solv
390.3	390.3-1	machinery company	former shop, built 1926, stove heat	shop & storage yard	3 buildings: 1 & 2) 1-story industrial, built 1926, space heaters; 3) 1-story equipment shed/shop, built 1951, no heat / vacant lot	Yes	South	Low	RP	pet, gas, PAHs
400.3	400.3-4	paint storage		paint storage			South	Low	RP	solv
430.3	430.3-1	steel co. and machine shop	1-story machine shop, built 1925		Four buildings: 6-story retail building (built 1912), 9-story warehouse (built 1916), 9-story warehouse (built 1946), 9-story warehouse (built 1966) - all hot water heat		South	Low	RP	solv, met
440.2	440.2-1	steel co.			1-story discount store, built 1993, forced air		South	Moderate	SC	metals
<b>Old Sites That Have Been Removed from Exhibit 6-4</b>										
10.05	10.05-1	sign painting	1-story building with 2 stores, built 1932, 2 stoves	sign painting	2-story commercial building, built in 1932, no heat		North	Low	RP	solv
10.05	10.05-2	gas station & auto repair	1-story gas station, built 1950, oil burner, tanks: 2-6,000 gallon, 1-4,000 gallon, 1-550 gallon	gas station & auto repair	1-story commercial building, built 1977, Auto Body Repair & Painting		North	Moderate	RP	gas
30.1	30.1-1	gas station	1-story gas station, built 1930, demolished 1941?	gas station	1-story office & warehouse building, forced air heat, built in 1919.		North	Moderate	RP	gas
30.1	30.1-3	gas station and auto repair	1-story gas station, built 1930, demolished 1945?	gas station and auto repair			North	Moderate	RP	gas
30.1	30.1-4	paint products, floor factory	1-story floor factory, built 1926, steam heat	paint products			North	Moderate	RP	solv

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
30.2	30.2-1	gas station and auto repair	1-story shop building built 1929, stove heat, used for auto repair, 1-story gas station built 1929, stove heat	gas station and auto repair	vacant land		North	Moderate	RP	gas
30.3	30.3-3	sign company			masonry building built in 1920		North	Moderate	RP	solv
30.3	30.3-4	gas station and auto repair	Gas station, built 1930, torn down 1956, stove heat		masonry building built in 1920		North	Moderate	RP	gas
40.1	40.1-2	gas station	Built in 1933, single story gas station, with stove.	gas station			North	Moderate	RP	gas
50.1	50.1-1	cleaners	Built in 1944-45, 1-story laundry with boilers and garage. Tank inventory includes 1-9,550 gallon fuel oil tank.	dry cleaning on 1950 Sanborn			North	High	SC	solv
50.1	50.1-2	cleaning supply company	Built in 1924, listed as a two-story warehouse [furniture repair], with oil burner. Company provides dry cleaning supplies and laundry dyes.	cleaning supplies / furniture upholstery & paint spraying			North	High	SC	solv
60.1	60.1-1	gas station	1-story service station, built 1958, oil burner; 1-6,000 gallon, 2-4,000 gallon & 2-500 gallon tanks, 1 hydraulic lift	gas station	Vacant Lot		North		RP	gas
60.1	60.1-4	dry cleaners	1-story building with balcony, store & warehouse building, built 1929, steam/oil burner; dry cleaning plant	dyers & cleaners	1-story building, built 1929, forced air heat; recorded as restaurant		North		SC	solv
60.3	60.3-1	hotel	1-story cleaning plant & laundry, built 1946, steam heat/oil burner; replaced by 3-story motel, built 1961, electric heat	gas station (Polk) / dry cleaners (Sanborn & Polk)	3-story motel, built in 1961, electric heat	Yes	North	High	SC	solv/gas
70.05	70.05-2	heating equipment	1-story warehouse & store, built 1920, 2 oil burners, demolished 1960	sheet metal works with paints (Sanborn)	1-story building, built 1962, package unit heating		North		RP	metals/solv
70.05	70.05-3	electroplating	1-story shop & offices, built 1895, oil burner heat, demolished 1960. Also 1-story residence, built 1895, stove heat, demolished 1948.	electroplating	1-story building, built 1962, package unit heating		North		SC	metals, solv
70.05	70.05-4	printers		printers	1-story building, built 1962, package unit heating		North		RP	solv
70.1	70.1-1	gas station and auto repair	1-story gas station, built 1930, no heat (also grease shed), no info on tanks; demolished and rebuilt in 1959 for Union Oil, oil burner, tanks: 1-5,000-gallon, 1-2,000-gallon, 1-1,000-gallon	gas station & auto repair	parking lot		North		SC	gas/pet

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
70.1	70.1-2	machine shop	1 story office & shop building, built 1945, stove	machine shop	1-story industrial building, built 1945, space heaters		North		SC	solv, metals
70.4	70.4-1	cleaners, laundry	1 story store building, built 1930, steam heat/oil burner; remodeled 1944 as dry cleaner & laundry	Dry cleaners, note on Sanborn "cleaning fluid tank in ground"	5-story motel building, built 1959, hot water heat		North	High	SC	solv
70.5	70.5-1	mfg. chemist, generators	1-story warehouse and factory, built 1950, gravity hot air furnace/oil burner	mfg. chemist / generators	1-story water house, built in 1950, space heaters		North	Low	RP	solv
80.5	80.5-1	restaurant	1-story gas and service station, built 1934, stove heat, torn down 1953; replaced by café, oil burner heat, built 1954	gas station	1-story convenience store with gas station, built 1998, heat pump	Yes	North	Moderate	RP	gas
80.6	80.6-2	gas station	1-story gas station, stove heat, built 1936, removed 1954; grease shed, oil service on gravel area, 3 pumps	gas station	(Lots 7 - 11) parking lot		North	Moderate	RP	gas
80.6	80.6-3	gas station	1-story service station, built 1940, 2-2,000 gallon tanks, 4-1,500 gallon tanks, 1 hoist; 3 pumps, torn down in 1948		(Lots 7 - 11) parking lot		North	Moderate	RP	gas
90.2	90.2-1	oil company	Bulk fuel storage facility, several aboveground storage tanks, and numerous buildings: 3-story office building built in 1924, steam heat; cart house, built in 1927; truck loading rack, built in 1927?; 1-story pump house built in 1927; 2 story office building, oil burner heat, built in 1949; 2-story warehouse, steam heat, built ?; and 1-story garage	numerous tank farms	vacant land	Yes	North Waterfront , Seawall		SC	pet/gas
130.9	130.9-1	gas station	auto service/gas station built 1934, stove heat, 3-1,000 gallon tanks; 1959: station remodeled - oil burner heat, 4-4,000 gallon tanks, 1-1,000 gallon tank, 1-550 gallon tank, 2 hoists	gas station	parking lot (vacant land)		North	Moderate	RP	gas
140.9	140.9-1	gas station & auto repair	1-story repair shop, built 1939, torn down 1971, stove heat, 1-hydraulic lift	gas station & auto repair	parking lot (vacant land)		North	Moderate	RP	pet/gas
141.1	141.1-1	car wash	Maxwell Motors, used car lot with 1-story office, built in 1938, stove heat; 1-story car wash added 1956	gas station	Car Wash (no details on buildings)	Yes	North	Low	RP	gas
141.2	141.2-1	service station	2-story gas station, built 1934, no heat, 1-3,000 gallon tank, 3-3,000 gallon tanks, 4-1,500 gallon tanks, 1-hoist	gas station	parking lot (vacant land)		North	Moderate	RP	gas

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
190.2	190.2-1	gas station	1-story gas station built in 1919 with 1-550 gallon tank	gas station	Pike Place Market Park		Central	Moderate	RP	
190.2	190.2-3	printers		printers	Pike Place Market Park		Central	Moderate	RP	
190.2	190.2-4	gas station, metal plating	1-story gas station built in 1925, stove heat, 3-750-gallon tanks; located under current Alaskan Way Viaduct (the station was torn down to build the freeway); metal plating business formerly in adjacent retail building torn down for Viaduct.		No records available		Central	Moderate	SC	
220.2	220.2-2	motor oil company	1-story gas station with 1-300 gallon tank and 2-550 gallon tanks, stove heat inside, built 1932, torn down 1965		Condominium, 4 5-story buildings, built 1982, electric heat		Central, Seawall	Low	RP	gas
260.2	260.2-1	mixed use building	2-story warehouse, built in 1909, demolished in 1962 and block converted to paved parking lot		13-story condominium building, built 1983, complete HVAC	Yes	Central, Seawall	Low	RP	metals
270.2	270.2-1	printing co., chemical co.	5-story warehouse with retail, built in 1910 covering entire block	mfrs	5-story office/retail, built 1910, heat pump		Central, Seawall	High	SC	solv
270.2	270.2-2	tailors and cleaners					Central, Seawall	High	SC	solv
270.2	270.2-5	cleaners		clothes cleaners			Central, Seawall	High	SC	solv
280.2	280.2-4	Parking Facility			3-story office building, built 1906, steam without boiler	Yes	Central, Seawall	Moderate	SC	pet
290.2	290.2-1	printers	Constructed 1910, 6-story commercial/retail building	printing	6-story office, built 1910, steam heat without boiler		Central, Seawall	Low	RP	solv
290.2	290.2-2	ink mfr.		ink mfr.			Central, Seawall	Low	RP	solv
290.2	290.2-3	engineer company		marine gasoline & diesel			Central, Seawall	Low	RP	gas, pet
350.2	350.2-1	gas station	1-story gas station, built 1937, stove heat	gas station	3-story parking structure, built in 1984, unknown heating system		Central	Low	RP	gas
380.3	380.3-1	cleaning products		cleaning compounds	built 1914, 2-story industrial, hot water heat		South	Low	RP	solv
380.3	380.3-2	junk company	built 1954, stove heat	junk yard			South	High	SC	metals, pet, PCBs

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
390.1	390.1-1	warehouse		machine shops & blacksmith		Yes	South	Low	RP	solv, metals, gas
390.5	390.5-1	warehouse and transfer company	warehouse: signs indicate chemicals, adhesives, colors, foundry & steel mill supplies, built 1926		2-story building, built 1901, space heaters		South		RP	solv, pet
390.5	390.5-2	electric motors/distribution company	store, built 1901, stove heat	oil and gasoline / oil treating compounds	2-story building, built 1901, space heaters, 1-story parking, labs and office building, built 1937, warmed and cooled air		South		RP	solv, pet
390.5	390.5-3	metal finishing and painting operation	built 1937, stove heat	metal finishing and painting	1-story parking, labs and office building, built 1937, warmed and cooled air		South		RP	solv
390.5	390.5-4	radiator business	warehouse, built 1928, stoker heat		2-story storage warehouse, built 1928, forced air unit heat		South		RP	metals
390.5	390.5-5	auto wrecking	built 1916, stove heat		1-story warehouse, built 1970, space heaters		South		SC	pet
390.5	390.5-6	textile bag mfr.	built 1938, stove heat	textile bag mfrs	2-story office building, built 1996, space heaters		South		SC	solv, pet
410.1	410.1-1	Terminal 30	built 1913: 1-story garage (2), maintenance shop, warehouse (2), truck oil loading rack, train loading rack, pipe shed, and tanks (tank farm, bulk)	tank farm	Port Terminal 30	Yes	South	Moderate	SC	pet
410.1	410.1-2	gas station	1-story service station, built 1950, stove heat; 2-1,000 gallon and 1-550 gallon tanks	gas station			South	Moderate	RP	gas
430.1	430.1-3	gas station		gas station			South	Moderate	RP	gas
430.1	430.1-5	railyard dock		40-gallon chemical containers			South	Moderate	SC	solv
430.1	430.1-6	gas station	1-story warehouse, 2-story dock, built 1918, oil burner; storage/shop building	gas station			South	Moderate	RP	gas
460.3	460.3-1	produce company warehouse, former garage	1-story warehouse built 1926, oil-burner; garage built 1955, no heat (many 55-gallon drums in photo); Café/Tavern, built 1920, moved 1954, stove, torn down 1968; garage built 1927, stove	Bolt and nut mfg., 2nd hand machinery storage	One warehouse building built in 1926, no heat		South		SC	solv, pet, pcb, metals

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
460.3	460.3-2	machine storage company	built 1922, no heat; machine shop and shed, built 1921, no heat; office, built 1922, stove	2nd Hand machinery junk yard and machine manufacturers	Two buildings: one (industrial light manufacturing) built in 1974 space heaters; one (office) building built 1974, forced air.		South		SC	solv, pet, pcb, metals
470.1	470.1-6	saw mill company		machine shop / saw mill with oil house			South		RP	solv, metals, pet
470.1	470.1-7	saw mill company	1-story fuel bunker, built 1915, 2-story machine shop, built 1921, stove heat		not reviewed, not adjacent		South		RP	solv, metals, pet
470.3	470.3-2	brass foundry		brass foundry			South		SC	metals
470.3	470.3-3	machinery company		machine shop	2 buildings: 1) 1-story machine shop, built 1917, space heaters; 2) 2-story pattern storage building, built 1937, no heat		South		SC	solv, metals, pet
470.35	470.35-2	water distribution company	2-story office, built 1951, oil burner		4 buildings: 1) 1-story industrial, built 1941, no heat 2) 1-story industrial, built 1969, no heat 3) 2-story offices, built 1951, hot water heat 4) 1-story part washing building, built 1993, no heat	Yes	South		RP	metals, gas, pet
470.35	470.35-3	brass foundry	1-story machine shop & foundry, built date unknown, stove heat				South		RP	solv, metals
470.35	470.35-4	engineering works		boiler shop	commercial service building (no details listed)		South		RP	metals
470.35	470.35-5	machinery manufacturing	1-story factory, built 1941, oil burner		lots 12-16: commercial service building (no details listed)		South		RP	solv, metals, pet
470.35	470.35-6	truck repair		truck repair		Yes	South		RP	pet
470.35	470.35-7	machine shop & pattern shop		machine shop & pattern shop			South		RP	solv, metals
480.5	480.5-1	brass foundry	1- & 2-story warehouse, built 1924, oil burner; 2-story foundry & factory, built 1917, stove heat		1-story warehouse, built 1924, no heat / Copper Works/Mechanical - 3 buildings covering portions of lots 1-3 & 21-22: 1) 1-story industrial, built 1918, no heat; 2) 1-story industrial, built 1947, no heat; 3) 1-story industrial, built 1917, no heat		South		SC	metals

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
480.5	480.5-2	copper works and machine shop	1-story factory, manufacturing, sales; machine shop built 1918, oil burner	welding & fabricating	Copper Works/ Mechanical - 3 buildings covering portions of lots 1-3 & 21-22: 1) 1-story industrial, built 1918, no heat; 2) 1-story industrial, built 1947, no heat; 3) 1-story industrial, built 1917, no heat		South		SC	solv, metals
480.5	480.5-3	Forge Works		blacksmiths & toolmakers	1-story warehouse, built 1924, no heat		South		RP	metals
480.5	480.5-4	Machine Works	1-story warehouse, shop, and factory, built 1941, 1947, 1956, oil burner	machinery shop	1-story industrial, built 1941, no heat		South		SC	solv, metals
480.5	480.5-5	machinery sales & service		machinery sales & service	3 buildings: 1) 20 story office, built 1946, forced air unit; 2) 1-story industrial shop, built 1945, no heat.; 3) 1-story industrial shop, built 1949; Manufacturing Company, Inc. - 8 buildings: 1) 1-story industrial, built 1947, no heat; 2) 1-story fabrication shop, built 1949, no heat; 3) warehouse, built 1949, labeled "bldg.#3,4,5,&6", no heat; 4) 1-story office, built 1949, labeled as "bldg.#7 & #8", forced air unit		South		RP	solv, metals, pet
480.5	480.5-6	steel works	1- & 2-story warehouse/office, built 1945, two oil burners		1) 20 story office, built 1946, forced air unit; 2) 1-story industrial shop, built 1945, no heat.; 3) 1-story industrial shop, built 1949		South		SC	metals
480.5	480.5-7	oil house		oil house	8 buildings: 1) 1-story industrial, built 1947, no heat; 2) 1-story fabrication shop, built 1949, no heat; 3) warehouse, built 1949, labeled "bldg.#3,4,5,&6", no heat; 4) 1-story office, built		South		RP	pet
480.5	480.5-8	steel fabricating company		fabricating, steel product mfgs	shop, built 1949, no heat; 3) warehouse, built 1949, labeled "bldg.#3,4,5,&6", no heat; 4) 1-story office, built		South		SC	metals

Exhibit 6-4. Recommended PSIs for Adjacent Properties (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Current Tax Assessor Notes	Listed Site?	Segment	Rank	RP/SC <sup>2</sup>	Primary Contaminant(s)
480.5	480.5-9	sheet metal works	1-story sheet metal shop/warehouse/office, built 1947-49, stove heat, deep pit 12'x16', painting, spray structure, sand blast structure	steel fabricating & welding, gas tank shown	1949, labeled as "bldg.#7 & #8", forced air unit		South		SC	solv, gas, metals
480.5	480.5-10	auto truck repair		auto truck repair	1-story industrial, built 1941, no heat		South		RP	solv, metals, pet
480.5	480.5-11	tool works		2 oil tanks			South		RP	solv, metals
480.5	480.5-12	chains and sprockets, metals company, ice machine company		/ 1 gas tank shown / machine shop & mfg, 1 gas tank	Vacant commercial land / 3 buildings: 1) 20 story office, built 1946, forced air unit; 2) 1-story industrial shop, built 1945, no heat; 3) 1-story industrial shop, built 1949;		South		RP	solv, metals, gas
480.7	480.7-1	sheet metal manufacturing	1-story warehouse, built 1926, stove heat		4 buildings: 1) 1-story building, built 1926, no heat; 2) 1-story warehouse building, built 1949, hot water heat; 3) 1-story warehouse building, built 1952, no heat; 4) 1-story warehouse building, built 1976, no heat		South		SC	metals
480.7	480.7-2	power company	1-story power plant, built 1920, 2 rotary generators (13,000 volts)	/ substation			South		SC	pcb, pet

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## Chapter 7 SECONDARY AND CUMULATIVE IMPACTS

Secondary and cumulative impacts of both Build Alternatives include an overall reduction of contaminants in the environment. Specifically, contamination may be discovered and cleaned up that would otherwise remain in place. Also, removing potential hazardous material release sources, such as USTs, would prevent future contamination from occurring. However, construction activities could uncover contaminated material, allowing more direct exposure to the public and spread of contamination if preventative measures were not implemented.

Up to 84 potentially contaminated sites for the Tunnel Alternative (the Preferred Alternative) and the Elevated Structure Alternative have been identified for possible acquisition or modification. Up to an additional 18 contaminated sites would be acquired or modified if the Whatcom Railyard were to be relocated. Contaminated sites that are acquired could result in liability for cleanup beyond the construction phase.

Other secondary and cumulative impacts are discussed in Chapter 7 of the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report.

### 7.1 Tunnel Alternative (Preferred Alternative)

The stacked tunnel alignment (preferred alignment) would require acquisition or modification of 84 potentially contaminated sites, whereas the side-by-side tunnel alignment would require acquisition or modification of 98 contaminated sites. Contaminated sites that are acquired could result in liability for cleanup beyond the construction phase. Relocation of the Whatcom Railyard would include acquisition or modification of 18 additional sites.

### 7.2 Elevated Structure Alternative

The Elevated Structure Alternative with a reconfigured Whatcom Railyard would require acquisition or modification of 82 potentially contaminated sites. If the Whatcom Railyard were relocated, 103 potentially contaminated sites would be acquired or modified. Contaminated sites that are acquired could result in liability for cleanup beyond the construction phase.

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## Chapter 8 OPERATIONAL MITIGATION

The operational mitigation measures are the same as presented in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Chapter 8).

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## Chapter 9 CONSTRUCTION MITIGATION

Contamination would likely be encountered during construction of the Tunnel Alternative (Preferred Alternative) or the Elevated Structure Alternative. The project could avoid some areas of contamination by not acquiring properties that have been identified as having known or potential contamination. However, contamination may not be avoidable in areas of the SR 99 right-of-way where earthwork is anticipated.

Both Build Alternatives contain some construction elements in common that would require soil and/or groundwater disposal, as described in the 2004 Draft EIS Appendix U, Hazardous Materials Discipline Report (Chapter 9).

A summary of the revised estimated volume of soil that would be removed for the Tunnel and Elevated Structure Alternatives is presented in Exhibit 6-1. A summary of the revised estimated volume of material that is potentially contaminated is presented in Exhibit 6-2. The quantities of soil were estimated based on the design depths and the depth of Holocene deposits, which were assumed to be contaminated, as a worst-case scenario. Where construction activity would likely contaminate spoils (diaphragm walls, drilled shafts, deep soil mixing, jet grouting), all of the material that would be removed was assumed to be contaminated. All of the existing rail ballast, ties, and obstructions that would be removed were also assumed to be contaminated. As presented in Exhibit 6-2, some construction activities result in less waste or spoils that could be contaminated.

For structures that would be acquired or modified, verification of the presence of asbestos-containing building material and lead-based paint and an estimation of the quantities of each material occurring in and on the structure to be demolished would need to be completed prior to demolition. Up to 24 buildings have been identified for the updated Tunnel and Elevated Structure Alternatives. One building would be modified or acquired for the Relocated Whatcom Railyard.

Hazardous materials handling and disposal options are the same as presented in the 2004 Draft EIS Appendix U (Section 9.1.2).

### 9.1 Mitigation for Specific Alternatives

Mitigation and hazardous materials handling and disposal options for the construction impacts of the proposed alternatives are summarized below.

### 9.1.1 Tunnel Alternative (Preferred Alternative)

In the stacked tunnel alignment, 84 sites and 19 buildings would be either acquired or modified, whereas 98 sites and 24 buildings would be either acquired or modified for the side-by-side tunnel alignment. An additional 18 sites and 1 building would be acquired or modified if the Whatcom Railyard were relocated rather than reconfigured. In addition, the side-by-side tunnel alignment would generate the largest quantity of excavated fill soils from the waterfront.

Hazardous materials handling and disposal options are the same as presented in the 2004 Draft EIS Appendix U (Section 9.1.2). Minimization of impacts is the same as presented for the Tunnel Alternative of the 2004 Appendix U (Section 9.1.4).

### 9.1.2 Elevated Structure Alternative

For the Elevated Structure Alternative with the Reconfigured Whatcom Railyard, 82 sites would be either acquired or modified. If the Whatcom Railyard were relocated, 103 sites would be acquired or modified. In comparison to the Tunnel Alternative, the Elevated Structure Alternative with the Reconfigured Whatcom Railyard would involve acquisition or modification of the fewest number of buildings and parcels.

Hazardous materials handling and disposal options and minimization of impacts are the same as presented in the 2004 Draft EIS Appendix U (Section 9.1.2).

## 9.2 Preliminary Cleanup Cost Estimate

### 9.2.1 Underground Storage Tank Removal/Closure Costs

The following cost estimates are for tank removal and disposal only and do not include the cost of overexcavation or trucking of soil to the selected disposal/treatment facility, if required.

Household Heating Oil Tank Removal	\$1,000	per tank
Service Station Tank Removal	\$3,000 to \$8,000	per tank
Product/Sludge Disposal	\$2 to \$4	per gallon
Site Assessment/Reconnaissance (no known release)	\$1,500 to \$5,000	per site

### 9.2.2 Soil Disposal and Treatment Costs

The following cost estimates are for soil disposal only and do not include the cost of excavation or trucking to the selected disposal/treatment facility.

### Petroleum-Contaminated Soils

Land Reclamation Facility Disposal	\$5 to \$12	per ton
Thermal Treatment	\$30 to \$35	per ton
Landfill Disposal (RCRA Subtitle D)	\$30	per ton

### Halogenated Solvent-, EPA Priority Pollutant-, and/or Corrosive Waste-Contaminated Soil

Landfill Disposal – Non-Dangerous Waste	\$30	per ton
Landfill Disposal – Dangerous Waste (Metals)	\$180	per ton
Landfill Disposal – Dangerous Waste (Organics)	\$430	per ton
Incineration – Dangerous Waste	\$600	per ton

### 9.2.3 Groundwater Treatment and/or Disposal Costs

Groundwater treatment and/or disposal options during construction are discussed in the 2006 Supplemental Draft EIS Appendix S, Water Resources Discipline Report.

For the north end of the project, where only perched groundwater has been encountered, off-site treatment and disposal could cost between \$0.25 and \$2 per gallon depending upon type and level of contaminants present.

### 9.2.4 Contaminated Building Debris Costs

The cost estimates provided in this section are presented on a unit cost basis, because the volume of potential asbestos-containing building materials that could be encountered during the proposed action is not known at this time.

Pre-Demolition Building Survey – \$1,500 to \$6,000 per structure depending on the size of structure and the number of structures involved.

Asbestos Abatement – The following includes a sample list of asbestos-containing building materials that could be found in the various buildings and their associated removal/disposal costs. Estimated costs for preparing abatement specifications and for providing abatement oversight are also included.

Ceiling Tiles	\$2 to \$3	per square foot
Textured Ceiling (popcorn)	\$5 to \$7	per square foot
Fire Doors	\$50 to \$75	per door
Sheet Flooring	\$3 to \$5	per square foot
Floor Tiles (9- or 12-inch)	\$1 to \$2	per square foot
Mastic (floor tile or sheet flooring)	\$2 to \$4	per square foot
Wallboard, Tape and Mud	\$2 to \$4	per square foot

Roofing (built-up)	\$1 to \$2	per square foot
Roof Patching	\$1 to \$2	per square foot

### 9.3 Construction Planning

The construction planning is the same as presented in the 2004 Draft EIS Appendix U (Section 9.2).

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## Chapter 10 REFERENCES

- EDR (Environmental Data Resources, Inc.). 2001. The EDR Area Study Report for the Viaduct, Seattle, WA, 98121. Report prepared by EDR, Southport, Connecticut for Shannon & Wilson, Inc., Seattle, Washington. September 2001.
- Shannon & Wilson, Inc. 2004. Site remediation and current conditions report Former Metro Bus Barn site, Seattle Center: Report by Shannon & Wilson, Inc., Seattle, Wash., job no. 21-1-12151, for Seattle Center, Seattle, Washington. September 2004.
- Shannon & Wilson, Inc. 2005a. Draft geotechnical and environmental data report, SR 99: Alaskan Way viaduct & seawall replacement project: Report by Shannon & Wilson, Inc., Seattle, Wash., job no. 21-1-09490, for U.S. Federal Highway Administration, Washington Department of Transportation, and City of Seattle, Seattle, Washington. May 2005.
- Shannon & Wilson, Inc. 2005b. Draft geotechnical and environmental data report - north of the Battery Street Tunnel, SR 99: Alaskan Way viaduct & seawall replacement project: Report by Shannon & Wilson, Inc., Seattle, Wash., job no. 21-1-09490, for U.S. Federal Highway Administration, Washington Department of Transportation, and City of Seattle, Seattle, Washington. June 2005.
- WSDOT (Washington State Department of Transportation). 2005. Environmental Procedures Manual, EM 31-11. September 2005.
- WSDOT (Washington State Department of Transportation), City of Seattle, and U.S. Department of Transportation, Federal Highway Administration. 2004. SR 99: Alaskan Way Viaduct & Seawall Replacement Project Draft Environmental Impact Statement. Washington State Department of Transportation, Urban Corridors Office, Seattle, Washington.
- Waterstone Environmental Inc. 2000. Phase II Soil and groundwater sampling report and remediation action plan subject property located at 325 Aurora Avenue North, Seattle, Washington. Prepared for RPD Vagabond Associate A. LLC, El Segundo, California. Prepared by Waterstone Environmental, Inc. Fullerton, California. April 2000.

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**ATTACHMENT A**

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**Sites Excluded Based on Screening Criteria**

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## APPENDIX A

### SITES EXCLUDED BASED ON SCREENING CRITERIA

#### LIST OF EXHIBITS

**Exhibit No.**

- |     |   |
|-----|---|
| A-1 | UST and RCRA Small and Large Quantity Generator Sites |
| A-2 | Emergency Response Notification System (ERNS) Sites   |
| A-3 | Oil Heat Only Sites                                   |

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**Exhibit A-1. UST and RCRA Small and Large Quantity Generator Sites<sup>1</sup>**

EDR Site Number	Property Use	UST	RCRA - LQG	RCRA - SQG
<b>Sites That Have Been Added to Exhibit B-1</b>				
10	auto repair			X

<sup>1</sup> Sites that have not been identified as a site with known or potential contamination based on former/current land use (sites not included on other tables).

**Exhibit A-2. Emergency Response Notification System (ERNS) Sites**

Site/Address	EDR Map ID <sup>1</sup>
<b>No Sites Added to Exhibit B-2</b>	

<sup>1</sup> Environmental Data Resources, Inc., 2001, The EDR Area Study Report: Report prepared by Environmental Data Resources, Inc., Southport, Conn. for Shannon & Wilson, Inc., Seattle, Wash., inquiry number 679391.4s, September.

**Exhibit A-3. Oil Heat Only Sites**

Block No.	Property Use	Comments/Description (Archive)	Current Tax Assessor Notes
<b>Sites That Have Been Added to Exhibit B-3</b>			
1.05	Residential	2-story, built 1906, oil burner	1-story duplex, built 1906, forced air gas heat
1.05	Residential	1-story, built 1908, oil burner	1-story duplex, built 1908, gas heat
1.05	Residential	1-story, built 1925, oil burner	1.5-story duplex, built 1925, forced air gas heat
1.05	Residential	1-story, built 1904, oil burner	1-story, 10 unit condominium building, built 1979, heat not known
1.05	Residential	1-story, built 1895, torn down 1958, stove	Vacant land
1.05	Residential	1-story, built 1921, oil burner	1-story duplex, built 1921, gas heat
1.05	Residential	1-story, built 1924, oil burner	1.5-story, built 1924, oil heat
1.06	Residential	2-story residence, built 1910, oil burner	Vacant land

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**ATTACHMENT B**

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**Sites with Documented and Potential Contaminant Releases**

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Exhibit B-1. Sites With Documented and Potential Contaminant Releases

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
1.06	1.06-1	auto repair	1-story garage built in 1950, oil burner	auto repair	1951 / 1956 / 1960 / 1965 / 1970 / 1975 / 1980 / 1989-1990	1969	vacant land		North	Yes, North (5)	RP	pet
1.06	1.06-2	auto repair, printers		auto repair, printers	1938 / 1940 / 1943 / 1951 / 1956 / 1960 / 1965 / 1970 / 1975 / 1980 / 1985	1969	11-story apartment building, built 1993, electric heat		North	Yes, North (5)	RP	pet, solv
1.06	1.06-3	gas station, auto repair, sign manufacturer		gas station, auto repair, sign manufacturer	1938 / 1940 / 1943 / 1980 / 1985		11-story apartment building, built 1993, electric heat/ vacant land		North	Yes, North (5)	RP	gas, pet, solv
1.08	1.08-1	auto repair, gas station	1-story garage then recap shop, built 1946, stove	auto repair	1951 / 1956 / 1965 / 1970		1-story retail store, built 1946, forced air		North	Yes, North (5)	RP	pet
1.08	1.08-2	outboard motor sales & service, gas station	new 1-story gas station replaced in 1960-61, tanks: 1-3,000 gallon & 1-280 gallon	outboard motor sales & service		1950	1-story auto repair garage, built 1960, forced air		North	Yes, North (5)	RP	pet/gas
1.08	1.08-3	delicatessen	new 1-story gas station replaced in 1955, tanks: 2-10,000 gallon & 1-550 gallon	gas station		1969	1-story retail store, built 1952, forced air	Yes	North	Yes, North (5)	RP	gas
1.1	1.1-1	printers and publications	2-story retail store, built 1950, hot water heat	printers and publications	1956, 1960, 1965, 1970				North	Yes, North (5)	SC	solv
1.2	1.2-1	electronics company					Three buildings: 1) 1-story office building, built 1948, forced air heat; 2) 2-story office building, built 1948, forced air heat; 3) 2-story office building, built 1977, forced air	Yes <sup>4</sup>	North	Yes, North (5)	RP	pet
10.05	10.05-2	gas station & auto repair	1-story gas station, built 1950, oil burner, tanks: 2-6,000 gallon, 1-4,000 gallon, 1-550 gallon	gas station & auto repair		1969, 1950	1-story commercial building, built 1977, Auto Body Repair & Painting		North	Yes, North	RP	gas
20.1	20.1-2	engine repair	1-story store and garage, built 1937. Safeway in 1937 photo, parking garage in 1962 photo.	engine repair		1950, 1969	(Lots 5 & 6) 1-story office building, built 1937, HVAC		North	Yes, North	RP	pet
30.1	30.1-1	gas station	1-story gas station, built 1930, demolished 1941?	gas station			1-story office & warehouse building, forced air heat, built in 1919.		North	Yes, North	RP	gas
30.1	30.1-3	gas station and auto repair	1-story gas station, built 1930, demolished 1945?	gas station and auto repair	1938, 1940 / 1943		(Lots 3-6) 3 commercial buildings: 1-story warehouse, built in 1946, no heat; 1-story factory, built in 1945, no heat; 1-story warehouse, built in 1926, space heaters		North	Yes, North	RP	gas
30.1	30.1-4	paint products, floor factory	1-story floor factory, built 1926, steam heat	paint products	1938				North	Yes, North	RP	solv
30.2	30.2-1	gas station and auto repair	1-story shop building built 1929, stove heat, used for auto repair, 1-story gas station built 1929, stove heat	gas station and auto repair	1938, 1940 / 1951, 1956, 1960	1950	vacant land		North	Yes, North	RP	gas
30.3	30.3-3	sign company					masonry building built in 1920		North	Yes, North	RP	solv
30.3	30.3-4	gas station and auto repair	Gas station, built 1930, torn down 1956, stove heat				masonry building built in 1920		North	Yes, North	RP	gas
40.05	40.05-1	bus maintenance	1-story bus barn & offices, built date not recorded, hot water/oil burner	bus repair shop with fueling & machine shop	1938, 1940, 1943, 1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985	1917, 1950, 1969	no current buildings	Yes	North	Yes, North	RP	solv, metals, pet

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
40.05	40.05-2	public utility		Substation & transformer house		1917, 1950	no current buildings		North	Yes, North	SC	pcbs
40.1	40.1-1	machine shop		machine shop		1950	(Entire Block) Sports Facility		North	Yes, North	RP	solv, metals
40.1	40.1-2	gas station	Built in 1933, single story gas station, with stove.	gas station	1938, 1940 / 1951	1950			North	Yes, North	RP	gas
40.1	40.1-3	auto repair		auto repair	1938	1950			North	Yes, North	RP	pet
40.1	40.1-5	sports facility		paints		1950		Yes	North	Yes, North	RP	solv
40.2	40.2-3	gas station	Built in 1934, single story service station, stove heat, addition in 1948.	gas station	1938, 1940, 1951	1950		parking lot		North	Yes, North	RP
40.3	40.3-1	print shop	3-story bank building, built in 1956, oil heat, print shop in basement				3-story bank, built 1956		North	Yes, North	SC	solv
40.3	40.3-2	auto repair	1-story repair garage, built 1957				not reviewed, not adjacent		North	Yes, North	RP	pet
40.4	40.4-1	natural gas company	E4 Garage built 1964, gas forced air heat / Repair garage-building #2, date built and heating not listed / Office and warehouse, built 1963-64 (to replace building D, torn down in 1964), oil burner / gas stand, built 1964, no heat / building C, built 1918, gas heat, torn down after 1951 / Building E, built 1909, gas heat, torn down 1964 (Building B also torn down 1964, no reference to when it was built or its heat)		1951, 1956, 1965, 1970, 1975, 1980, 1985, 1989-90		Two buildings: one reinforced concrete office building built 1963, forced air; one reinforced concrete parking and repair garage, built 1964, forced air		North	Yes, North	RP	pet
50.02	50.02-1	hotel supply	2-story store & warehouse, built 1918, hot water heat; then dairy building.		1950		Two buildings: 2-story garage and storage building, built in 1947, no heat; 2-story gymnasium/fitness center, built in 1994, warmed and cooled air.		North	No	RP	pet
50.05	50.05-1	autobody works & repairing, paint room	1-story garage, built 1947, paint shop noted, oil burner, auto rebuild noted, torn down 1962	autobody works & repairing, paint room		1950	Garage; masonry building built in 1947 and gymnasium constructed of prefabricated steel built in 1994		North	Yes, North	RP	solv
50.05	50.05-2	gas station & auto repair		gas station & auto repair	1938, 1940, 1943-44, 1951	1950	No parcel number/ part of the roadway		North	Yes, North	RP	gas
50.1	50.1-1	cleaners	Built in 1944-45, 1-story laundry with boilers and garage. Tank inventory includes 1-9,550 gallon fuel oil tank.	dry cleaning on 1950 Sanborn	1951, 1956, 1960	1950	parking lot		North	Yes, North	SC	solv
50.1	50.1-2	cleaning supply company	Built in 1924, listed as a two-story warehouse [furniture repair], with oil burner. Company provides dry cleaning supplies and laundry dyes.	cleaning supplies / furniture upholstery & paint spraying	1938, 1940	1950			North	Yes, North	SC	solv
60.1	60.1-1	gas station	1-story service station, built 1958, oil burner; 1-6,000 gallon, 2-4,000 gallon & 2-500 gallon tanks, 1 hydraulic lift	gas station	1960	1950, 1969	Vacant Lot		North	No	RP	gas
60.1	60.1-2	gas station & auto repair	1-story gas station, built 1946, stove, 3-1,500 gallon tanks, 1 hoist; also 1-5,000 gallon, 1-20,000 gallon, 1-10,000 (diesel) gallon, & 1 oil tank (no volume)	gas station & auto repair		1950, 1969	1-story commercial building, built 1963, forced air heat		North	No	RP	gas
60.1	60.1-3	oil company	new 2-story shop & office building, built 1963-1964, hot air furnace/oil burner				1-story commercial building, built 1963, forced air heat		North	No	RP	pet

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
60.1	60.1-4	dry cleaners	1-story building with balcony, store & warehouse building, built 1929, steam/oil burner; dry cleaning plant	dyers & cleaners	1938, 1940, 1943, 1951, 1956, 1960, 1965, 1970	1917, 1950, 1969	1-story building, built 1929, forced air heat; recorded as restaurant		North	No	SC	solv
60.2	60.2-1	public utility	Transfer yard and associated structures including: 1-story control building, built 1950, electric heat; 1-story shop, pump room, and crane tower, built 1950, electric heat	substation	1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985	1950, 1969	Broad Street Substation, 4 buildings, built 1950, all have electric heat. 1 control building, 1 crane tower, 1 shop, 1 pump room		North	Yes, North	SC	pcbs
60.3	60.3-1	hotel	1-story cleaning plant & laundry, built 1946, steam heat/oil burner; replaced by 3-story motel, built 1961, electric heat	gas station (Polk) / dry cleaners (Sanborn & Polk)	1938, 1940, 1951	1950	3-story motel, built in 1961, electric heat	Yes	North	Yes, North	SC	solv/gas
70.05	70.05-1	fuel dealer	2 story attic, built 1897, hot air furnace, probably oil burner	fuel dealer	1938		1-story building, built 1962, package unit heating		North	No	RP	pet
70.05	70.05-2	heating equipment	1-story warehouse & store, built 1920, 2 oil burners, demolished 1960	sheet metal works with paints (Sanborn)	1940, 1943, 1951	1950	1-story building, built 1962, package unit heating		North	No	RP	metals/solv
70.05	70.05-3	electroplating	1-story shop & offices, built 1895, oil burner heat, demolished 1960. Also 1-story residence, built 1895, stove heat, demolished 1948.	electroplating		1950	1-story building, built 1962, package unit heating		North	No	SC	metals, solv
70.05	70.05-4	printers		printers	1956		1-story building, built 1962, package unit heating		North	No	RP	solv
70.1	70.1-1	gas station and auto repair	1-story gas station, built 1930, no heat (also grease shed), no info on tanks; demolished and rebuilt in 1959 for Union Oil, oil burner, tanks: 1-5,000-gallon, 1-2,000-gallon, 1-1,000-gallon	gas station & auto repair	1938,1940,1943,1951, 1956 / 1960, 1965, 1970, 1975	1950, 1969	parking lot		North	No	SC	gas/pet
70.1	70.1-2	machine shop	1 story office & shop building, built 1945, stove	machine shop	1951, 1956, 1960, 1965, 1970, 1975 / 1980		1-story industrial building, built 1945, space heaters		North	No	SC	solv, metals
70.4	70.4-1	cleaners, laundry	1 story store building, built 1930, steam heat/oil burner; remodeled 1944 as dry cleaner & laundry	Dry cleaners, note on Sanborn "cleaning fluid tank in ground"	1938, 1940 / 1943-44, 1951, 1956	1950	5-story motel building, built 1959, hot water heat		North	Yes, North	SC	solv
70.6	70.6-1	petroleum, asbestos goods, auto repair	1-story office and shop, built 1931, oil heat	asbestos goods / auto repair	1940 / 1943, 1951, 1956 / 1989		1-story industrial light manufacturing building, built 1931, hot water heat		North	No	RP	pet
70.6	70.6-2	printers	2-story office and shop, built 1954, oil burner, "service shop" noted	printers	1980, 1985, 1989		2-story office building, built 1954, forced air heat		North	No	RP	solv
70.6	70.6-3	auto repair, paints	3-story warehouse/garage, built 1933, oil heat	auto repair / paints	1938, 1940 / 1943, 1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985	/ 1950, 1969	1-story masonry storage warehouse, built 1933, space heaters		North	No	SC	solv
80.5	80.5-1	restaurant	1-story gas and service station, built 1934, stove heat, torn down 1953; replaced by café, oil burner heat, built 1954	gas station	1938, 1940, 1943-44, 1951	1950	1-story convenience store with gas station, built 1998, heat pump	Yes	North	Yes, North	RP	gas
80.6	80.6-2	gas station	1-story gas station, stove heat, built 1936, removed 1954; grease shed, oil service on gravel area, 3 pumps	gas station	1938, 1940, 1943-44, 1951	1950	(Lots 7 - 11) parking lot		North	Yes, North	RP	gas
80.6	80.6-3	gas station	1-story service station, built 1940, 2-2,000 gallon tanks, 4-1,500 gallon tanks, 1 hoist; 3 pumps, torn down in 1948				(Lots 7 - 11) parking lot		North	Yes, North	RP	gas

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
80.6	80.6-4	auto repair, gas station	1926: 1-story auto repair service, built in 1926, 3-550 gallon tanks, 1 hydraulic lift, torn down by 1943; replaced with 1-story gas station built 1943, stove heat, hoist, 1-1,000 gallon tank, 1-2,000 gallon tank, 1-8,000 gallon tank; tanks & buildings removed 1951; new repair garage built 1961	gas & oil, auto repair	1965, 1970, 1975, 1980, 1985, 1989	1950, 1969	1-story auto repair garage, built 1961, space heaters	Yes <sup>4</sup>	North	Yes, North	RP	pet
130.8	130.8-1	dry cleaners, printer, auto repair	garage and storage, 2-stories, built 1949-50, 2-1000 gallon tanks listed, no heat listed	dry cleaners / printer	1951 / 1965 / 1970	/ 1969 /	18-story apartment building, built 1949, hot water heat (site is located on undeveloped portion of property)		North	Yes, North (5)	SC	pet/gas
130.9	130.9-1	gas station	auto service/gas station built 1934, stove heat, 3-1,000 gallon tanks; 1959: station remodeled - oil burner heat, 4-4,000 gallon tanks, 1-1,000 gallon tank, 1-550 gallon tank, 2 hoists	gas station	1938, 1940, 1943-44, 1951, 1956, 1960, 1965, 1970, 1975	1949, 1969	parking lot (vacant land)		North	Yes, North	RP	gas
140.2	140.2-1	auto repair	1-story garage built in 1925, stove heat, 1-3000 gallon tank and 2-1000 gallon tanks	auto repair garage			5-story condominium building, built 1992, electric wall heat.		Central Seawall	No	RP	pet
140.9	140.9-1	gas station & auto repair	1-story repair shop, built 1939, torn down 1971, stove heat, 1-hydraulic lift	gas station & auto repair	1940, 1943, 1951, 1956, 1960, 1965	1949, 1969	parking lot (vacant land)		North	Yes, North	RP	pet/gas
141.2	141.2-1	service station	2-story gas station, built 1934, no heat, 1-3,000 gallon tank, 3-3,000 gallon tanks, 4-1,500 gallon tanks, 1-hoist	gas station	1938, 1940		parking lot (vacant land)		North	Yes, North	RP	gas
151.1	151.1-1	automobile dealership	Used car lot, built 1950, torn down 1965; 1-story auto dealership, built in 1965 (service area, wash area, and hoist in drawing)	auto sales & service		1969	1-story office building, built 1965, forced air heat	Yes	North	Yes, North	RP	pet/gas
151.1	151.1-2	auto repairs	1-story office, stove heat, built 1950, torn down 1965, looks like auto repair shop				1-story office building, built 1965, forced air heat		North	Yes, North	RP	pet
151.1	151.1-3	paints	1-story retail building, built 1943, stove heat, torn down 1952	paints		1949	4-story hotel, built 1967, hot and chilled air		North	Yes, North	RP	solv
210.1	210.1-2	service station	1-story gas station built in 1935 with stove heat; tanks listed: 1-4000 gallon, 2-3000 gallon, 1-280 gallon, 1-hydraulic lift	gas station	1938, 1960, 1965, 1970	1949, 1969	lots 1-5: parking lot		North Waterfront, Seawall	Yes, both sections	RP	gas
220.2	220.2-1	iron works/auto repair	1-story machine shop built in 1918: auto repair, electric blacksmithing, acetylene welding, machine work				2-story retail/apartments/storage, built 1925 / condo?		Central, Seawall	Yes, Central	RP	solv, metals, pet
220.2	220.2-3	truck service		truck service		1969	2-story storage warehouse building, built 1951, space heaters		Central, Seawall	Yes, Central	RP	pet
240.3	240.3-1	auto repair	4-story warehouse constructed in 1919 with steam heat		1938		17-story apartment, built 1994, electric wall heat		Central, Seawall	Yes, Central	RP	pet
240.3	240.3-2	fertilizer mfrs.	3-story store & loft built in 1911	mfrs	1960, 1965, 1970, 1975, 1980		no tax assessor records for this lot		Central, Seawall	Yes, Central	SC	metals
240.3	240.3-3	laundry	4-story retail/hotel built 1910, acid tank in basement	Chinese laundry	1940		25-story apartment, built 1996, electric wall heat		Central, Seawall	Yes, Central	SC	metals/solv
240.3	240.3-4	plating works		electroplating	1940, 1956, 1960, 1970, 1975	1949			Central, Seawall	Yes, Central	SC	metals, solv
240.3	240.3-5	leather works	4-story office/loft, built 1901	mfrs & delivery	1938, 1940	1969			Central, Seawall	Yes, Central	SC	solv
240.4	240.4-1	laundry, printers	4-story hotel & retail, built 1889, oil burner		1938, 1940, 1943-44, 1985; printer 1951		4-story hotel, built 1900, steam heat		Central, Seawall	Yes, Central	SC	solv

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
240.4	240.4-2	printers	5-story retail, built 1906	printing		1969	2 buildings: 1) 6-story office building, built 1906, steam heat; 2) 2-story office building, built 1900, steam heat		Central, Seawall	Yes, Central	RP	solv
240.4	240.4-3	printers		printers	1938, 1940				Central, Seawall	Yes, Central	RP	solv
240.4	240.4-4	printers/hand laundry/service station		hand laundry	1938 / 1943-44, 1951, 1956, 1960, 1965			Vacant commercial lot	Yes <sup>4</sup>	Central, Seawall	Yes, Central	RP
250.2	250.2-1	parking lot and fueling	4-3,000-gallon tanks installed in ~1962; 1-6,000 gallon tank installed in 1974; 11'x4'6" building with stove heat	fueling		1969	Surface parking lot		Central, Seawall	Yes, Central	RP	gas
250.3	250.3-1	lithographer	4-story retail & loft constructed in 1907 with steam heat		1938, 1940, 1943-44, 1951, 1956, 1965	1949	parking garage, built 1983, "warmed and cooled air" for heat		Central, Seawall	Yes, Central	SC	solv
250.4	250.4-1	sheet metal works	4-story hotel & retail, built 1906, steam heat		1943-44, 1965		Condominiums, 6-story condominium building, built 1902, electric heat		Central, Seawall	Yes, Central	SC	metals
250.4	250.4-2	cleaners	4-story hotel & retail constructed in 1902 with oil heat	clothes cleaners	1938, 1985, 1989-90				Central, Seawall	Yes, Central	SC	solv
250.4	250.4-3	sheet metal works		sheet metal works	1938, 1940				Central, Seawall	Yes, Central	RP	metals
250.4	250.4-4	paint company	1-story retail building constructed in 1915, steam heat, corner of 1st and Spring		1940, 1943-44		Condominium, 22-story condominium, built 1983, complete HVAC		Central, Seawall	Yes, Central	SC	solv
250.4	250.4-5	printers			1940, 1956, 1960, 1965, 1975				Central, Seawall	Yes, Central	SC	solv
250.4	250.4-6	printers		printers	1943-44, 1951, 1956, 1960, 1965, 1970, 1975, 1980				Central, Seawall	Yes, Central	SC	solv
250.5	250.5-1	dry cleaners	1-story retail building, built 1914	dry cleaners	1956		29-story office building, built 1991, no heat		Central, Seawall	Yes, Central	RP	solv
250.5	250.5-2	printers		printers	1960, 1965, 1970, 1975	1969			Central, Seawall	Yes, Central	SC	solv
250.5	250.5-3	printers	6-story office & retail building, built 1903	printers	1938, 1940, 1943-44, 1951, 1956				Central, Seawall	Yes, Central	SC	solv
250.5	250.5-4	hatters	1-story retail building, built 1908, stove heat, torn down 1967, Building C, Laundry	cleaners	1951		Bank, 8-story office building, built 1968, heat pump		Central, Seawall	Yes, Central	SC	solv
250.5	250.5-5	printing company/auto repair shop	print shop, built 1911	auto repair shop		1969			Central, Seawall	Yes, Central	RP	solv/pet
250.5	250.5-6	printing and publishing co.	2-story bank, built 1908, torn down 1969		1938, 1940, 1943-44, 1951				Central, Seawall	Yes, Central	RP	solv
270.2	270.2-1	printing co., chemical co.	5-story warehouse with retail, built in 1910 covering entire block	mfrs	1989-90 / 1938 / 1951	1969	5-story office/retail, built 1910, heat pump		Central, Seawall	Yes, Central	SC	solv
270.2	270.2-2	tailors and cleaners			1951, 1956, 1960, 1965				Central, Seawall	Yes, Central	SC	solv
270.2	270.2-5	cleaners		clothes cleaners	1938, 1940				Central, Seawall	Yes, Central	SC	solv
280.3	280.3-1	auto repair	one 4 story building on entire block, built 1890	auto repairs	1951		parking lot		Central, Seawall	Yes, Central	RP	pet
280.3	280.3-2	cleaners		clothes pressers	1938, 1940, 1943-44				Central, Seawall	Yes, Central	RP	solv

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
280.3	280.3-3	printers			1951, 1956, 1960, 1965				Central, Seawall	Yes, Central	RP	solv
280.3	280.3-4	metal works and tin shop		metal works	1938, 1943-44				Central, Seawall	Yes, Central	RP	metals
280.5	280.5-1	cleaners	3-story hotel & retail building, built 1890, steam heat, torn down 1955	clothes cleaners	1938		17-story office building, built 1958, heat pump		Central, Seawall	Yes, Central	SC	solv
280.5	280.5-2	auto repair	16-story office & retail building, built 1959	auto repair	1960, 1965				Central, Seawall	Yes, Central	RP	pet
290.2	290.2-4	gas station, auto repair	Constructed 1938, 1-story, automotive repair building, 1 tank, 2 hydraulic lifts, stove heat, demolished 1966 for parking lot	gas station, auto repair	1938 / 1940, 1943-44, 1951, 1956, 1960, 1965	1949	surface parking lot		Central, Seawall	Yes, Central	RP	gas
290.3	290.3-1	printers	4-story building, built 1914	printing materials / machine shop	1938, 1940	/ 1969	built in 1914, steam heat without boiler		Central, Seawall	Yes, Central	SC	solv, metals
290.3	290.3-2	mfg. chemists		mfg chemists	1938				Central, Seawall	Yes, Central	RP	solv
290.3	290.3-3	electric company/power company	2 buildings: 1901 3-story brick powerhouse with 1-14,000 gallon tank (under Post St.); 1911 1-story garage with steam heat	power plant	1940, 1943-44	1969	2 buildings: 1) 3-story industrial steam plant, built 1901; 2) 1-story storage warehouse, built 1925, no heat.		Central, Seawall	Yes, Central	SC	pcbs
290.3	290.3-4	oil clarifier distributors	3-story hotel constructed in 1913-14 with steam heat		1940 / 1951		Condo per map		Central, Seawall	Yes, Central	RP	pet
290.3	290.3-5	power machine works/welding company		welding shop	1938, 1940, 1943-44, 1956, 1960, 1965, 1970 / 1956, 1965	1969	2 buildings: 1) 3-story industrial steam plant, built 1901; 2) 1-story storage warehouse, built 1925, no heat.		Central, Seawall	Yes, Central	SC	solv, metals
290.3	290.3-6	steam company						Yes	Central, Seawall	Yes, Central	SC	pcbs, pet
290.4	290.4-1	tailors and cleaners	6-story office & retail building, built 1908, steam heat		1960		9-story parking garage/bank/retail/office, built 1970, no heat listed		Central, Seawall	Yes, Central	RP	solv
290.4	290.4-2	smelter	6-story office & retail building, built 1897, steam heat		1940		6-story office, built 1900, warmed and cooled air heat		Central, Seawall	Yes, Central	SC	metals
290.5	290.5-1	auto repair	building constructed 1958, stove heat, 4-1,000 gallon tanks, 1-500 gallon tank				3-story parking garage, built 1958		Central, Seawall	Yes, Central	RP	gas
290.5	290.5-2	printers	16-story retail & office building, steam heat		1938		17-story office building, built 1911, heat pump		Central, Seawall	Yes, Central	RP	solv
290.5	290.5-3	dye works/ cleaners and tailors		clothes pressers	1940, 1943-44, 1951, 1985 / 1965		3-story office building, built 1903, steam without boiler		Central, Seawall	Yes, Central	SC	solv
290.5	290.5-4	real estate co., condo					Condominium, 20-story condominium building, built 2000, Complete HVAC	Yes <sup>4</sup>	Central, Seawall	Yes, Central	RP	metals, gas
330.1	330.1-1	gas station		gas station	1938, 1940		Pier 48 Victoria Line 2-story dock, built 1901		Central	Yes, Central	RP	gas
350.1	350.1-2	gas station	1-story warehouse, built 1963-64, inventory is listed in tank section, a portion of the inventory is covered by photo	gas station	1938, 1940	1950	Pier 46 terminal (marine/commercial/fish) - 4 buildings: 1) 2-story transit warehouse/gate/guardhouse, built 1967, warmed and cooled air; 2) office building, built 1967, warmed and cooled air; 3) transit warehouse/transit shed, built 1967, space heaters; 4) storage warehouse/maintenance, built 1967, space heaters	Yes	Central	Yes, Central	RP	gas
380.1	380.1-2	junk company				1916	Terminal 37, 42 and 47 (marine/commercial/ fish)		South	Yes, South	RP	pet, metals, PCBs

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
380.1	380.1-3	coal briquette plant		Coal briquette plant		1916	- 4 buildings: 1) 2-story transit warehouse/gate/guardhouse, , built 1967, warmed and cooled air; 2) office building, built 1967, warmed and cooled air; 3) transit warehouse/transit shed, built 1967, space heaters; 4) storage warehouse/maintenance, built 1967, space heaters		South	Yes, South	RP	pet, gas
380.1	380.1-4	automotive service (Terminal 37)	garage/service station, built 1914, stove heat, fuel pumps					Yes	South	Yes, South	RP	gas
390.1	390.1-2	gas station	Built 1906, warehouse with stove, torn down 1941; gasoline station, built 1924, 4-550 gallon tanks with pipe line, grease pit				Terminals 37, 42 and 46 (marine/commercial/fish) Port of Seattle- 4 buildings: 1) 2-story transit warehouse/gate/guardhouse, built 1967, warmed and cooled air; 2) office building, built 1967, warmed and cooled air; 3) transit warehouse/transit shed, built 1967, space heaters; 4) storage warehouse/maintenance, built 1967, space heaters.		South	Yes, South	RP	gas
390.5	390.5-1	warehouse and transfer company	warehouse: signs indicate chemicals, adhesives, colors, foundry & steel mill supplies, built 1926				2-story building, built 1901, space heaters		South	No	RP	solv, pet
390.5	390.5-2	electric motors/distribution company	store, built 1901, stove heat	oil and gasoline / oil treating compounds	1960	1916	2-story building, built 1901, space heaters, 1-story parking, labs and office building, built 1937, warmed and cooled air		South	No	RP	solv, pet
390.5	390.5-3	metal finishing and painting operation	built 1937, stove heat	metal finishing and painting		1916	1-story parking, labs and office building, built 1937, warmed and cooled air		South	No	RP	solv
390.5	390.5-4	radiator business	warehouse, built 1928, stoker heat				2-story storage warehouse, built 1928, forced air unit heat		South	No	RP	metals
390.5	390.5-5	auto wrecking	built 1916, stove heat		1938, 1940, 1943		1-story warehouse, built 1970, space heaters		South	No	SC	pet
390.5	390.5-6	textile bag mfr.	built 1938, stove heat	textile bag mfrs	1985, 1989-90	1950, 1969	2-story office building, built 1996, space heaters		South	No	SC	solv, pet
410.1	410.1-2	gas station	1-story service station, built 1950, stove heat; 2-1,000 gallon and 1-550 gallon tanks	gas station	1938, 1943-44, 1951, 1956, 1960, 1965	1950, 1969	Port Terminal 30		South	Yes, South	RP	gas
410.2	410.2-1	oil tank, railroad	railroad operating property: fuel tank, sanding tower, locker/wash/office, filter house (1922)	steel oil tank		1969	railroad operating property - commercial rail terminal		South	Yes, South	RP	pet
410.2	410.2-2	railroad repair shop	1-story tool and motor car house, built 1955, stove heat						South	Yes, South	RP	pet
410.2	410.2-3	railroad, tank	500-BBL tank						South	Yes, South	RP	pet
410.2	410.2-4	railroad repair shop, blacksmith	1-story shop, built in 1954; sand house, garage, blacksmith, built 1945-46; 2-story yard office, oil burner						South	Yes, South	RP	metals
410.2	410.2-5	railroad machine shop, power house, storage tank, garage	1-story locker house, machine shop, storage shed, lumber shed, power house, bar car, storage shed, 5-car garage (2), box car (2), and storage tank						South	Yes, South	RP	solv, metals, pet
410.2	410.2-6	railroad oil shed	1-story oil shed						South	Yes, South	RP	pet
430.1	430.1-3	gas station		gas station	1943, 1956		Terminal 30, 1-story government building, passenger terminal, built 2003, complete HVAC		South	Yes, South	RP	gas
430.1	430.1-6	gas station	1-story warehouse, 2-story dock, built 1918, oil burner; storage/shop building	gas station	1951				South	Yes, South	RP	gas
430.2	430.2-1	railroad oil house, railroad car repair	1-story car repair, built 1954	oil house		1969	Railway company operating terminal		South	Yes, South	RP	pet

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
450.2	450.2-1	chain and supply company	One prefabricated metal warehouse building, built 1970, no heat; one metal warehouse-shed building, built 1946, no heat, torn down 1970; one post and beam warehouse building, built 1938, stove heat; one warehouse mill building, built ? (1941), no heat; Block 20 owned by Railyard Co. in 1912; masonry office and crane way, built 1949, oil burner; black top built 1946; Wood barn built 1908, no heat, torn down 1946	Junk and used pipe storage, used machinery, wire and rope warehouse	1940, 1943-44, 1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985, 1989-90	1950, 1969	10 buildings: 1) built 1938, wood frame industrial, heat none or unknown, (industrial light mfg); 2) 1943, masonry warehouse, heat none or unknown; 3) 1949, wood frame shed, (material storage), heat none or unknown; 4) 1970, prefabricated steel equipment shed, heat none or unknown; 5) 1969, prefabricated steel equipment shop, no heat; 6) 1952, (industrial heavy mfg) structural steel building, no heat; 7) 1965, (industrial heavy mfg) structural steel building, no heat; 8) 1939, wood frame (industrial light mfg), hot water-radiant heat; 9) 1966, (industrial light mfg) prefabricated steel building, no heat; 10) 1939, wood frame garage (storage), no heat.	Yes4	South	Yes, South	SC	pet, pcb, metals
450.2	450.2-2	machinery assembly	Crane shed, steel frame and concrete block, built 1955, no heat; Mill construction concrete "fabricating steel" building, built 1942, no heat	Machinery Assembly	Not Listed	1950, 1969	Two buildings one wood frame built 1942, and one prefabricated steel built 1955, heat source none or unknown		South	Yes, South	SC	metals
450.2	450.2-3	metal fabricators	One tank housing masonry building, built 1964, no heat; one single-frame factory building, built 1943, oil burner	Wood working, iron works, steel and castings storage	1989-90	1950, 1969	One wood frame warehouse building built 1943, space heaters, used for industrial light mfg	Yes4	South	Yes, South	SC	metals, pet
460.3	460.3-1	produce company warehouse, former garage	1-story warehouse built 1926, oil-burner; garage built 1955, no heat (many 55-gallon drums in photo); Café/Tavern, built 1920, moved 1954, stove, torn down 1968; garage built 1927, stove	Bolt and nut mfg., 2nd hand machinery storage	1980, 1985, 1989-90	1969	One warehouse building built in 1926, no heat		South	No	SC	solv, pet, pcb, metals
460.3	460.3-2	machine storage company	built 1922, no heat; machine shop and shed, built 1921, no heat; office, built 1922, stove	2nd Hand machinery junk yard and machine manufacturers	1938, 1940, 1943-44, 1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985, 1989-90	1916, 1950, 1969	Two buildings: one (industrial light manufacturing) built in 1974 space heaters; one (office) building built 1974, forced air.		South	No	SC	solv, pet, pcb, metals
470.1	470.1-1	brass foundry		foundry	1940		marine/commercial/fish terminal - 6 buildings: 1) 1-story gatehouse, built 1991, electric heat; 2) 1-story storage warehouse, built 1980, space heaters; 3) 2-story storage warehouse/fish shed, built 1938, no heat; 4) 1-story storage warehouse, built 1916, no heat; 5) 7-story cold storage warehouse, built 1916, refrigerated cooling; 6) 3-story cold storage warehouse, built 1921, refrigerated cooling		South	No	SC	metals
470.1	470.1-2	wholesale paints		wholesale paints	1940				South	No	RP	solv
470.1	470.1-3	auto repair	1-story auto repair shop, built 1968, 2 wash & dry areas, preparation area, mech. & paint area, paint storage, gasoline pump island, 1-1,000 gallon gas tank						South	No	RP	solv, gas
470.1	470.1-4	electric company and manufacturing company	1-story factory, built 1918, oil burner, 1-1,600 gallon & 1-1,800 gallon tank						South	No	RP	pet
470.1	470.1-5	wire manufacturing company		wire products & tying machinery	1938, 1940				South	No	RP	metals
470.1	470.1-6	saw mill company		machine shop / saw mill with oil house		1969 / 1916, 1950			South	No	RP	solv, metals, pet
470.1	470.1-7	saw mill company	1-story fuel bunker, built 1915, 2-story machine shop, built 1921, stove heat					not reviewed, not adjacent		South	No	RP

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
470.2	470.2-1	brass foundry/pipe warehouse		/ machine shop	1938, 1943, 1951, 1956	/ 1950, 1969	maintenance shop - 2 buildings: 1) 1-story garage/maintenance shop, built 1959, space heaters; 2) 1-story garage, built 1976, no heat		South	No	SC	solv, metals
470.2	470.2-2	auto body repair		repairs	1938, 1940				South	No	SC	metals
470.2	470.2-3	maintenance facility	1-story shop, built 1959, 1-1,000 & 2-300 gallon tanks; 2-story shop & store, built 1917, oil burner, 1-40-gallon oil tank	metal & machine shops, print shop	1938, 1940, 1943, 1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985, 1989	1950, 1969		Yes	South	No	SC	solv, metals, pet
470.2	470.2-4	foundry	1-1/2 story office, shop, & stevedore shop, built 1942, stove heat, 3 1/2 ton crane over dip tank		1938, 1940, 1943-44				South	No	SC	metals
470.25	470.25-1	crane company	1-story warehouse/shop, built 1918, coal stoker	garage & shop	1938, 1940, 1943		vacant lot / 1-story warehouse, built 1964, no heat		South	No	RP	metals
470.25	470.25-2	trucking company	1-story office, built 1966, tank (8,000 gallon?)				1-story storage building, built 1983, no heat	Yes	South	No	SC	solv
470.3	470.3-1	steel fabricating shop		steel fabricating		1969	4 buildings: 1) 1-story metal fabricating building, built 1917, space heaters; 2) 2-story office, built 1942, hot water heat; 3) 1-story manufacturing building, built 1917, no heat; 4) 1-story manufacturing building, built 1967, no heat		South	No	RP	metals
470.3	470.3-2	brass foundry		brass foundry	1938, 1940, 1943-44, 1951, 1960	1950, 1969			South	No	SC	metals
470.3	470.3-3	machinery company		machine shop	1938, 1940, 1943, 1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985, 1989	1950, 1969	2 buildings: 1) 1-story machine shop, built 1917, space heaters; 2) 2-story pattern storage building, built 1937, no heat		South	No	SC	solv, metals, pet
470.35	470.35-1	sheet metal, casting foundries, wire rope and equipment, engineering supply company, wire company	1-story warehouse, built 1918, stove/oil burner, 16'x16' fenced transformer	/ whse, factory / saw mill machinery / mesh manufacturers	1985, 1989 / 1938, 1940, 1951 / 1960 / 1965		- 3 buildings: 1) 1-story industrial, built 1918, no heat; 2) 1-story industrial, built 1941, no heat; 3) 1-story industrial, built 1965, no heat		South	No	SC	metals, pcbs
470.35	470.35-2	water distribution company	2-story office, built 1951, oil burner				4 buildings: 1) 1-story industrial, built 1941, no heat 2) 1-story industrial, built 1969, no heat 3) 2- story offices, built 1951, hot water heat 4) 1-story part washing building, built 1993, no heat	Yes	South	No	RP	metals, gas, pet
470.35	470.35-3	brass foundry	1-story machine shop & foundry, built date unknown, stove heat						South	No	RP	solv, metals
470.35	470.35-4	engineering works		boiler shop		1950	commercial service building (no details listed)		South	No	RP	metals
470.35	470.35-5	machinery manufacturing	1-story factory, built 1941, oil burner				lots 12-16: commercial service building (no details listed)		South	No	RP	solv, metals, pet
470.35	470.35-6	truck repair		truck repair		1969		Yes	South	No	RP	pet
470.35	470.35-7	machine shop & pattern shop		machine shop & pattern shop		1950			South	No	RP	solv, metals
470.35	470.35-8	warehouse	1-story warehouse/shop, built 1969, service area				1 story, built 1969, no heat, listed as storage warehouse		South	No	RP	pet

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
480.5	480.5-1	brass foundry	1- & 2-story warehouse, built 1924, oil burner; 2-story foundry & factory, built 1917, stove heat			1929	1-story warehouse, built 1924, no heat / Copper Works/Mechanical - 3 buildings covering portions of lots 1-3 & 21-22: 1) 1-story industrial, built 1918, no heat; 2) 1-story industrial, built 1947, no heat; 3) 1-story industrial, built 1917, no heat		South	No	SC	metals
480.5	480.5-2	copper works and machine shop	1-story factory, manufacturing, sales; machine shop built 1918, oil burner	welding & fabricating	1938, 1940, 1943, 1951, 1956, 1960, 1965, 1970, 1975, 1980, 1985	1967, 1949, 1929 (1929 - 3600 only)	Copper Works/ Mechanical - 3 buildings covering portions of lots 1-3 & 21-22: 1) 1-story industrial, built 1918, no heat; 2) 1-story industrial, built 1947, no heat; 3) 1-story industrial, built 1917, no heat		South	No	SC	solv, metals
480.5	480.5-3	Forge Works		blacksmiths & toolmakers	1938, 1940	1929	1-story warehouse, built 1924, no heat		South	No	RP	metals
480.5	480.5-4	Machine Works	1-story warehouse, shop, and factory, built 1941, 1947, 1956, oil burner	machinery shop	1985, 1989		1-story industrial, built 1941, no heat		South	No	SC	solv, metals
480.5	480.5-5	machinery sales & service		machinery sales & service		1949	3 buildings: 1) 20 story office, built 1946, forced air unit; 2) 1-story industrial shop, built 1945, no heat.; 3) 1-story industrial shop, built 1949; Manufacturing Company, Inc. - 8 buildings: 1) 1-story industrial, built 1947, no heat; 2) 1-story fabrication shop, built 1949, no heat; 3) warehouse, built 1949, labeled "bldg.#3,4,5,&6", no heat; 4) 1-story office, built 1949, labeled as "bldg.#7 & #8", forced air unit		South	No	RP	solv, metals, pet
480.5	480.5-6	steel works	1- & 2-story warehouse/office, built 1945, two oil burners				1) 20 story office, built 1946, forced air unit; 2) 1-story industrial shop, built 1945, no heat.; 3) 1-story industrial shop, built 1949		South	No	SC	metals
480.5	480.5-7	oil house		oil house		1967	8 buildings: 1) 1-story industrial, built 1947, no heat; 2) 1-story fabrication shop, built 1949, no heat; 3) warehouse, built 1949, labeled "bldg.#3,4,5,&6", no heat; 4) 1-story office, built 1949, labeled as "bldg.#7 & #8", forced air unit		South	No	RP	pet
480.5	480.5-8	steel fabricating company		fabricating, steel product mfgs	1951, 1956, 1960, 1965, 1970, 1975, 1989	1967, 1949			South	No	SC	metals
480.5	480.5-9	sheet metal works	1-story sheet metal shop/warehouse/office, built 1947-49, stove heat, deep pit 12'x16', painting, spray structure, sand blast structure	steel fabricating & welding, gas tank shown	1951, 1956, 1960	1967, 1949			South	No	SC	solv, gas, metals
480.5	480.5-10	auto truck repair		auto truck repair		1949	1-story industrial, built 1941, no heat		South	No	RP	solv, metals, pet
480.5	480.5-11	tool works		2 oil tanks		1949			South	No	RP	solv, metals

Exhibit B-1. Sites With Documented and Potential Contaminant Releases (continued)

Block	Site No.	Type of Business/ Reference Name	Description (Archive)	Description (Polk or Sanborn)	Polk Directory Years	Sanborn Map Years	Current Tax Assessor Notes for Adjacent Properties Only	Listed Site <sup>1</sup>	Sections	Property adjacent to sections (Y/N)	RP/SC <sup>2</sup>	Primary Contaminant(s)
480.5	480.5-12	chains and sprockets, metals company, ice machine company		/ 1 gas tank shown / machine shop & mfg, 1 gas tank		1967 / 1949 / 1929	Vacant commercial land / 3 buildings: 1) 20 story office, built 1946, forced air unit; 2) 1-story industrial shop, built 1945, no heat.; 3) 1-story industrial shop, built 1949;		South	No	RP	solv, metals, gas
480.55	480.55-1	steel fabricating & truck repairing		steel fabricating & truck repairing		1967	Terminal 106 East: 1-story warehouse, built 1886, space heaters		South	No	RP	metals, pet
480.6	480.6-1	iron works, foundry	1-story foundry, built 1918, stove heat			1967, 1949, 1929	1-story foundry building, built 1918, no heat	Yes	South	No	SC	metals, pet
480.6	480.6-2	machine works		auto parts / machine shop		1949 / 1967	2 1-story buildings: 1) office building built 1920, space heaters; 2) machine shop built 1957, space heaters		South	No	SC	solv, metals
480.7	480.7-1	sheet metal manufacturing	1-story warehouse, built 1926, stove heat			1949, 1929	4 buildings: 1) 1-story building, built 1926, no heat; 2) 1-story warehouse building, built 1949, hot water heat; 3) 1-story warehouse building, built 1952, no heat; 4) 1-story warehouse building, built 1976, no heat		South	No	SC	metals
480.7	480.7-2	power company	1-story power plant, built 1920, 2 rotary generators (13,000 volts)	/ substation		/ 1949, 1929			South	No	SC	pcb, pet
480.75	480.75-1	Building Company	1- & 2-story warehouse, built 1954, oil burner, vehicle service area				2-story warehouse, built 1954, no heat		South	No	RP	pet
480.75	480.75-2	Wax Manufactures	1-story warehouse, built 1948, oil burner	Floor wax mfrs.	1951, 1956, 1960, 1965, 1970	Maps not available	One warehouse building, built 1948, no heat		South	No	RP	pet

1 Site Listed in Environmental Records (databases)

2 RP = Reasonably Predictable; SC = Substantially Contaminated

3 Site Listed in Environmental Records; however this site is not identified on Exhibit 4-1 because it encompasses sediments from Block 220.05 to 290.1.

4 Site Listed in UST database only, installed prior to 1980; no known release.

5 Site adjacent to Lowered Aurora Ave. North option only.

Blank cells in Polk Directory, Sanborn Map, Description Archive, and Listed Site columns indicate there was no environmental problem identified

PET = petroleum

MET = metals

SOLV = solvents

GAS = gasoline

PCBs = poly-chlorinated biphenyls

PAHs = polycyclic aromatic hydrocarbons

UST = underground storage tank