



# FREMONT BRIDGE APPROACH REPLACEMENT PROJECT

Type, Size and Location Study, Volume I: Report

prepared for CITY OF SEATTLE  
prepared by PARSONS BRINCKERHOFF

February, 2003



---

# Table of Contents

<a href="#">EXECUTIVE SUMMARY</a>	1
<a href="#">1.0 INTRODUCTION</a>	3
<a href="#">1.1 Project Description</a>	3
<a href="#">1.2 Mainline Description</a>	3
<a href="#">1.3 Interchange Description</a>	4
<a href="#">1.4 Discipline Study Overview</a>	5
<a href="#">2.0 STUDIES AND COORDINATION</a>	13
<a href="#">2.1 Study Methodology</a>	13
<a href="#">2.2 Regulatory Database Review</a>	14
<a href="#">2.3 Historical Research</a>	16
<a href="#">2.4 Data Validation</a>	17
<a href="#">2.5 Site Screening Summary</a>	17
<a href="#">3.0 AFFECTED ENVIRONMENT</a>	19
<a href="#">3.1 Historical Overview</a>	19
<a href="#">3.2 Physical Environment</a>	20
<a href="#">3.3 Site-Specific Environmental Concerns</a>	21
<a href="#">3.4 Additional Environmental Testing</a>	24
<a href="#">4.0 POTENTIAL IMPACTS</a>	27
<a href="#">4.1 Project Involvement Summary</a>	28
<a href="#">4.2 Potential Project Impacts</a>	28
<a href="#">4.3 Secondary Impacts</a>	31
<a href="#">4.4 Cumulative Impacts</a>	31
<a href="#">4.5 Operational Impacts</a>	32
<a href="#">4.6 Potential Regulatory Considerations</a>	32
<a href="#">4.7 Further Investigations</a>	37
<a href="#">5.0 MITIGATION</a>	38
<a href="#">5.1 General</a>	38
<a href="#">5.2 Environmental Media</a>	38
<a href="#">5.3 Demolition Debris</a>	40
<a href="#">5.4 Spill Prevention Control and Countermeasure (SPCC) Plan</a>	40
<a href="#">5.5 Asbestos Containing Materials/Lead Base Paint</a>	41
<a href="#">5.6 Underground Utilities</a>	41
<a href="#">5.7 Worker and Public Health Safety</a>	42
<a href="#">5.8 Underground Storage Tanks (USTs)</a>	42
<a href="#">5.9 Cumulative and Secondary Impacts</a>	43
<a href="#">5.10 Operational Impacts</a>	43
<a href="#">5.11 Preliminary Cost Estimates</a>	43
<a href="#">5.12 Regulatory Mitigation Operations</a>	46
<a href="#">6.0 REFERENCES</a>	49
<a href="#">7.0 LIMITATIONS AND SIGNATURES</a>	50

## Appendices

Appendix A	Sanborn Maps
Appendix B	Topographic Maps
Appendix C	EDR Corridor Study Report
Appendix D	Washington State Department of Ecology Facility/Site Atlas Map and Facility Site Detail
Appendix E	City of Seattle Public Utilities Side Sewer Cards
Appendix F	Site Visit Photographs
Appendix G	Hazardous Building Materials Survey
Appendix H	Shannon & Wilson Letter Report, May 20, 2004

## List of Tables

<a href="#">Table 1: List of Properties Assessed</a>	18
<a href="#">Table 2: List of Assessed Project Areas</a>	27
<a href="#">Table 3: Cost Estimates</a>	46

## List of Figures

<a href="#">Figure 1: Vicinity Plan</a>	5
<a href="#">Figure 2: Fremont Bridge Approach Replacement Area</a>	6
<a href="#">Figure 3: Right-of-Way Plan R1 – Construction Access Area</a>	7
<a href="#">Figure 4: Right-of-Way Plan R2 – Construction Access Area</a>	8
<a href="#">Figure 5: Right-of-Way Plan R3 – North Approach</a>	9
<a href="#">Figure 6: Right-of-Way Plan R4 – Access to N. 34<sup>th</sup> Avenue</a>	10
<a href="#">Figure 7: Right-of-Way Plan R5 – Access to N. 34<sup>th</sup> Avenue</a>	11
<a href="#">Figure 8: Right-of-Way Plan R6 – South Approach</a>	12

## Acronyms

ACM.....Asbestos Containing Materials	LUST .....Leaking Underground Storage Tank
ACOE .....Army Corps of Engineers	MTBE.....Methyl Tertiary-Butyl Ether
AHERA ..Asbestos Hazard Emergency Response Act	MLLW ....Mean Lower Low-Water
AOC.....Area of Concern	MTCA ....Model Toxics Control Act
AST .....Aboveground Storage Tank	NESHAP National Emission Standards for Hazardous Air Pollutants
ASTM.....American Society for Testing and Materials	NPDES ...National Pollutant Discharge Elimination System
BGS .....Beneath Ground Surface	NPL .....National Priority List (Superfund)
BTEX.....Benzene, Toluene, Ethyl Benzene, and Xylene	OA .....Other Area
CA .....Corrective Action	PAH .....Polycyclic Aromatic Hydrocarbons
CAA.....Clean Air Act	PCB .....Polychlorinated biphenyls
COS .....City of Seattle	PEL.....Permissible Exposure Limit
CSO .....Combined Sewer Overflow	POTW.....Publicly Owned Treatment Works
CERCLA Comprehensive Environmental Response Compensation and Liability Act	PPE .....Personal Protective Equipment
DNR.....Department of Natural Resources	PSCAA ...Puget Sound Clean Air Agency
DOT .....United States Department of Transportation	PSI .....Preliminary Site Investigation
DPD .....Department of Planning and Development	PVC .....Polyvinyl chloride
Ecology... Washington State Department of Ecology	RCRA ....Resource Conservation and Recovery Act
EDR.....Environmental Data Research, Inc.	RCW.....Revised Code of Washington
EIS .....Environmental Impact Statement	ROW.....Right of Way
EPA .....Environmental Protection Agency	SIP .....State Implementation Plan
ESA .....Endangered Species Act	SPCC .....Spill Prevention Control and Countermeasures Plan
FHWA ....Federal Highway Administration	SVOC ....Semi-Volatile Organic Compounds
ISA.....Initial Site Assessment	SWMU....Solid Waste Management Unit
KCHD ....King County Health Department	SWPPP ...Stormwater Pollution Prevention Plan
LBP.....Lead Based Paint	TCLP .....Toxicity Characteristic Leaching Procedure per EPA Method 1311
L&I .....Washington State Department of Labor and Industries	TPH .....Total Petroleum Hydrocarbons
	TPS .....TPS Technologies - Soil Recyclers of Washington
	USG .....United States Gypsum

VOC.....Volatile Organic Compounds  
WAC.....Washington Administrative Code  
WSDOT..Washington State Department of  
Transportation  
UST .....Underground Storage Tank  
VOC.....Volatile Organic Compound

This page left intentionally blank

## Executive Summary

This report presents information on potential environmental concerns related to properties affected by the City of Seattle (COS)'s replacement of the north and south approaches to the Fremont Bridge (see Figures 1 and 2 in Section 1.0, *Introduction*). The north approach project footprint extends from N. 34<sup>th</sup> Street to the Ship Canal, and the south approach project footprint extends from the Ship Canal to W. Nickerson Street. A micropile-supported replacement structure was selected as the preferred alternative. An existing COS Operations and Maintenance Building under the south approach will be demolished.

An Initial Site Assessment (ISA) was prepared and submitted to the City of Seattle on August 2003. Efforts included historical research on industrial and commercial land use, regulatory agency database list and file reviews, and a visual site inspection and walk-through.

Because the new approach structures replace the existing structures and connect to the existing bridge, only the existing sites were considered in the Initial Site Assessment. Most sites were eliminated from further consideration because they were either located downgradient or were too far removed from the project area. The sites selected for detailed analysis are:

- The area immediately under the north approach
- The area immediately under the south approach (including the City of Seattle Operations and Maintenance Building)
- Approximate locations of proposed permanent and temporary easements are shown on Figures 3 through 8 in Section 1.0, *Introduction*.) Legal descriptions of easements have not been prepared at this time.

An Asbestos Hazard Emergency Response Act (AHERA) protocol asbestos survey was conducted in accordance with Regulation III, Article 4 of the Puget Sound Clean Air Agency (PSCAA) requirements. Approximately five linear feet of friable air cell asbestos pipe insulation was located in the Operations and Maintenance Building. Additionally, approximately 30 linear feet of non-friable Asbestos Containing Materials (ACM) mastic was located in the north engine room. Other suspected (but not sampled) items that may potentially contain ACMs are fire doors, machinery brake pads, and electrical panel insulation. All of these materials will be treated as if they contain greater than one percent (>1%) ACM and will be abated in advance of demolition work, as required by the PSCAA (Asbestos Control Standards Regulation III, Article 4) and the Washington State Department of Labor and Industries (L&I).

Inspection of fluorescent light fixtures also determined that polychlorinated biphenyls (PCB)-containing ballasts are present. Generally, fluorescent light fixtures manufactured prior to the late 1970s contain PCBs. It is estimated that approximately ten ballasts contain PCBs and will be abated and disposed of as hazardous waste prior to building demolition.

Approximately 18,500 square feet of lead paint was discovered in the Operations and Maintenance Building. Most of the paint chips failed the Toxicity Characteristic Leaching Procedure (TCLP) lead test. This will require lead paint and material containing lead paint to be disposed of as a dangerous waste. The costs for disposal can be reduced by proper abatement to limit the amount of failing TCLP lead in the waste stream generated by the building demolition.

Lead was also discovered in telecommunications conduits and conductor sheathing. The utility purveyor prior to building demolition will abate these materials and dispose of them as required under State law.

Petroleum-impacted soils were discovered at both approaches and will likely be encountered during excavation for water quality vaults, bridge piers, and utility excavation. The extent of the petroleum-impacted soils is discussed in a letter and report from Shannon & Wilson dated May 20, 2004 (see Appendix H). Petroleum-impacted soils generated as a result of this project will be disposed of according to requirements for special handling and disposal, and provisions will be made to protect the health and safety of workers and the public and to protect the environment from releases of contaminants or cross contamination. The impacted soils may be transported to an off-site soil burning facility or disposed of at a licensed landfill, dependent on actual levels of contamination at the time of excavation. It is estimated that approximately 1,000 in-place cubic yards (1,510 tons) of contaminated soils will be generated for disposal during this project.

One Underground Storage Tank (UST) and a disposal sump are known to be present at the Operations and Maintenance Building. The size of the UST is not known, but it is believed to be approximately 500 to 1,000 gallons in volume and was used to store gasoline. The sump is comprised of two buried 55-gallon drums. The UST and sump were not sampled during the project's geoprobe investigation due to unacceptable impacts to the operating shop. The UST and sump will be removed prior to commencement of building demolition. The exact extent of impacted soils from the UST and the sump, if any, are unknown.

Estimated costs for mitigation measures for hazardous materials uncovered are included in Table 3 (see Section 5.11.4). A total estimated cost for preliminary investigations and remedial construction is also included. Unit cost estimates are provided for each of the suspected impacts. The estimates are based on preliminary design; environmental data collected to date and visual walk-through inspections, and are discussed in Section 2.0.

Measures that could be implemented to mitigate project impacts may affect COS and WSDOT liability, worker safety, and construction activities. Given the numerous potential sources of contamination adjacent to the project area, the known contaminant sources, and the limited excavation required for the project, there would be minimal benefit in conducting additional investigations prior to construction.

Mitigation measures include preparing a media contingency plan that provides specific guidance for managing contaminated media. The contaminated media contingency plan shall address risk-based cleanup and recommend provisions for field screening options, notification requirements, and stockpile management. Groundwater mitigation measures include alternatives for construction activities that minimize or avoid intercepting the groundwater table, where possible. Surface water mitigation will be addressed in the Spill Prevention Control and Countermeasure (SPCC) plan. Mitigation measures for demolition debris rely on recycling and proper disposal of identified hazardous materials. Possible impacts related to the federal and State Superfund authorities within the project area shall be mitigated through early coordination with the Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology).

# 1.0 INTRODUCTION

## 1.1 Project Description

The bascule Fremont Bridge and its approaches were completed in 1917. The approach structures are now at the end of their serviceable life and require replacement. This project will replace the substandard approaches with new structures that meet current building and seismic codes. The north off-ramp to N. 34<sup>th</sup> Street will also be retrofitted and strengthened, and sidewalks and railings on the approach structures will be replaced.

Construction will consist of demolishing half the bridge approaches cut along the bridge's longitudinal centerline, and installing micropile footings, cast-in-place concrete pile cap and columns, pre-cast concrete girders, and cast-in-place concrete deck. After completion of the first half of the bridge approach deck, traffic will be switched to the newly constructed portion. The second half of the bridge deck approaches will be demolished and constructed in a similar manner.

Project work will also include modifying the bascule bridge's mechanical/electrical system used to raise and lower the drawbridge, the electrical power supply, and the electrical control wiring and relocating existing utilities as required for new construction. Storm drainage work will include constructing new underground conveyance piping from inlet leaders at bridge columns and routing them into an underground water quality vault. Stormwater will then be discharged without detention to the Ship Canal, which is an exempt receiving water body.

The existing City of Seattle Department of Transportation (SDOT) Operations and Maintenance Building located under the south approach to the Fremont Bridge will be demolished as a part of this project. Replacement of the building will be determined based on a pending needs evaluation.

See Figure 1 for a Project Vicinity Plan and Figure 2 for the Fremont Bridge Approach Replacement Area. Permanent and temporary easements are shown in Figures 3 through 8.

## 1.2 Mainline Description

The bulk of the project consists of demolishing and replacing the elevated roadway structure approaches to the Fremont Bridge. The new bridge approach structures would be located in the same location as the existing structures, to facilitate connection to the existing bascule span (movable) bridge portion and the existing street grid on both bridge ends. Aesthetic improvements would reflect the unique identity of the Fremont and Lower Queen Anne neighborhoods that front the north and south approaches respectively.

The overall width of the new structures would be 78 feet, matching the existing approaches. Existing lane widths are two 9.5-foot inside lanes and two 17.5-foot outside/curb lanes. At the south end of the N. 34<sup>th</sup> Street ramp, the 17.5-foot curb lane splits into two lanes, the curb lane turns east onto the N. 34<sup>th</sup> Street ramp, and the middle northbound lane continues northward. Sidewalks on the east and west sides are 11 feet wide.

The proposed new bridge approach structures would consist of six spans of 120-foot maximum span length on the northern 534-foot approach, and six spans that vary from 20 feet to 72 feet in length on the southern 124-foot approach. This would reduce the number of spans from the existing 32 to 12, but the overall length would remain the same.

The proposed north superstructure would consist of both standard WSDOT girders with a cast-in-place concrete slab as the deck, and cast-in-place concrete reinforced slab. The south superstructure would consist of 36-inch precast pre-stressed concrete bulb tee girders with a cast-in-place concrete slab, except the span adjacent to the bascule pier would consist of a cast-in-place, reinforced concrete slab. They would be designed for an HL-93 loading, consistent with the heavy truck and bus traffic using the bridge.

The north substructure would consist of four column piers throughout, supported by micro-pile-supported pile-caps. The south substructure would be more complex, to account for the City maintenance shop underneath the south approach and the multi-use trail that is skewed to the approach. A series of approximately 3-foot-diameter concrete columns supported by micro-pile-supported pile-caps in various bent configurations would be utilized to meet these demands. These foundation systems need to be verified with more detailed analysis to be based on additional geotechnical data obtained in the early design phase.

### **1.3 Interchange Description**

There are no interchanges (e.g., half-diamond interchanges, loop ramps, etc.) associated with this project. Intersections at Fremont Avenue N. and its intersections at W. Nickerson Street/Westlake Avenue and N. 34<sup>th</sup> Street will remain as currently configured. Minor revisions to the intersection of Evanston Avenue N. and N. 35<sup>th</sup> Street and the intersection of Fremont Avenue N. and N. 35<sup>th</sup> Street will also be accomplished as a part of the proposed project.

### **1.4 Discipline Study Overview**

The purpose of this study is to identify and assess the potential for encountering environmental contaminants above action levels on properties that could increase construction costs, delay project completion, and otherwise pose a liability to the City of Seattle. The information gathered in this discipline study will allow engineers and project managers to anticipate conditions and allow for timely design to address potentially hazardous materials. Sites that require specific consideration include:

- Locations within the proposed right-of-way where contaminants in the soil or groundwater could affect design or the cost of construction, including adjacent or hydrological upgradient properties with a potential to affect construction progress
- Properties currently considered for acquisition with conditions that while not increasing construction costs could represent an environmental liability to the City of Seattle.

## Figure 1: Vicinity Plan

**Figure 2: Fremont Bridge Approach Replacement Area**

**Figure 3: Right-of-Way Plan R1 – Construction Access Area**

**Figure 4: Right-of-Way Plan R2 – Construction Access Area**

**Figure 5: Right-of-Way Plan R3 – North Approach**

**Figure 6: Right-of-Way Plan R4 – Access to N. 34<sup>th</sup> Avenue**

**Figure 7: Right-of-Way Plan R5 – Access to N. 34<sup>th</sup> Avenue**

**Figure 8: Right-of-Way Plan R6 – South Approach**

The goals of the Hazardous Materials Discipline Report study are to:

- Identify historical and existing property uses within the proposed right-of-way that have a known or probable release of regulated or hazardous materials;
- Identify adjacent property uses where contaminants may have migrated from affecting water quality and soils within the project area;
- Identify relatively common or anticipated contaminants that are likely to occur, such as lead-based paint or asbestos in building construction;
- Estimate potential cleanup costs associated with the proposed construction activities, based on available information and best professional judgment;
- Provide mitigation options for areas with a high probability for encountering contamination during construction; and
- Identify areas that warrant additional investigation to further characterize potential impacts and provide needed information where data gaps may exist.

## **2.0 Studies and Coordination**

### **2.1 Study Methodology**

The overall study area includes properties both within and outside of the proposed right-of-way, temporary construction access easements, and permanent access easements that have a potential to affect construction activities and property acquisition. The study area is generally limited to within one mile of the project, with specific emphasis on upgradient properties with historical uses that could indicate a potential for environmental contamination. This study was accomplished by performing the following tasks:

- Identification of available local, state, and federal databases (e.g. Sanborn Maps) to identify potential or known contamination sources that could impact the proposed project;
- Review of publicly available records at local environmental agencies (e.g. Polk Directories, Sewer Cards) as necessary, to obtain supplemental information regarding present and past environmental conditions and incidents within the project study area;
- Interpretation of the project site's history using available aerial photographs and other historic information sources;
- Interviews of persons knowledgeable of the project site to identify specific project concerns;
- Conducting a visual walk-through of the project site to identify obvious or suspected contamination sources;
- Conducting additional soils testing by borings and materials sampling to identify the extent of potential contamination identified during the walk-through; and
- Summarizing the environmental conditions and testing results of known or suspected contaminated sites.

## 2.2 Regulatory Database Review

### 2.2.1 Methodology

A review of reasonably available records and data was pursued as a part of the Initial Site Assessment (ISA). The following records are incorporated into this review:

1. Federal National Priority Listed (NPL) Sites List
2. Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLS) List
3. Federal Resource Conservation and Recovery Information Systems (RCRIS) List
4. Washington State Department of Ecology General Files
5. Ecology Confirmed or Suspected Contaminated Sites
6. Ecology Leaking Underground Storage Tank (LUST) Sites
7. Ecology Underground Storage Tank (UST) Sites
8. Ecology Remediated Sites

#### 2.2.1.1 Federal NPL Sites List

Records review indicates that there are no National Priority Listed (NPL) sites within one mile of the project site.

#### 2.2.1.2 Federal CERCLS List

Records review indicates one Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLS) site located approximately one mile downgradient from the project site. This CERCLS site has been designated for “No Further Remedial Action Planned” and is not considered to have had any impact on the project site. A complete listing of review results is included in Appendices C and D.

#### 2.2.1.3 Federal RCRIS List

Records review indicates six Resource Conservation and Recovery Information Systems (RCRIS) sites located within the immediate project vicinity. Small-quantity generators include:

Peter Pan Seafoods	Product Unknown – No violations
Fremont Electric	Recycled Oil – No violations
Dusty Springs	Recycled Oil – No violations
Steel Products, Inc	Recycled Oil – No violations
Quadrant Lake Union Center	Recycled Oil – No violations
City of Seattle	Lead and Recycled Oil – No violations

There are no large-quantity generators in the project vicinity.

#### 2.2.1.4 Washington State Department of Ecology General Files

The Washington State Department of Ecology (Ecology) General Files indicate there have been a number of small-quantity hazardous waste generators in the immediate project vicinity. Research of available information indicated no releases or suspected releases. A complete listing of review results is included in Appendix D.

Small-quantity hazardous waste generator sites within close proximity to the project site include:

Growing Green Gardens

Address: 711 N. Northlake Way

Status: Inactive Small Quantity Hazardous Waste Generator. No reported releases.

Speaker Lab

Address: 735 N. Northlake Way

Status: Inactive Small Quantity Hazardous Waste Generator. No reported releases.

Harmon Contract

Address: 760 N. Northlake Way

Status: Inactive Small Quantity Hazardous Waste Generator. No reported releases.

Washington State Department of Transportation, Aurora Bridge 99 560

Address: SR 99 Mile Post 34.17 to 34.73

Status: Inactive

York Yachts

Address: 2955 N. Westlake

Status: Inactive Underground Storage Tank (UST)

PMC Power & Sail (formerly Wilson Marine)

Address: 2930 Westlake Avenue N.

Status: Inactive Leaking Underground Storage Tank (LUST) site. Active UST site.

#### 2.2.1.5 Ecology Confirmed or Suspected Contaminated Sites

None

#### 2.2.1.6 Ecology LUST sites

One LUST site is within the immediate project vicinity:

PMC Power & Sail (formerly Wilson Marine)

Address: 2930 Westlake Avenue N.

Status: Inactive LUST site. Active UST site.

#### 2.2.1.7 Ecology UST List

Two UST sites are within the project vicinity:

York Yachts

Address: 2955 N. Westlake

Status: Inactive Underground Storage Tank

PMC Power & Sail (formerly Wilson Marine)  
Address: 2930 Westlake Avenue N.  
Status: Inactive LUST site. Active UST site.

#### 2.2.1.8 Ecology Remediated Sites

Quadrant Corporation  
Address: 3307 Fremont Avenue N.  
Status: No Further Action (NFA)

In 1989, railway tracks and ties were removed from the north side of the Quadrant Corporation's Lake Union site in preparation for development. A Metro Stormwater Inspector saw visual evidence of soil contamination at the recently removed tracks and reported it to the Washington State Department of Ecology (Ecology). The area was subsequently added to Ecology's *Confirmed or Suspected Contaminated Sites* list. Testing showed Total Petroleum Hydrocarbons (TPH) levels from 110 ppm to 46,000 ppm along the railroad right-of-way. Polyaromatic Hydrocarbons (PAH) levels ranged from 0.08 ppm to 1.7 ppm. Pentaclorophenol (Penta) and Polychlorinated Biphenyls (PCBs) that exceeded Model Toxics Control Act (MTCA) cleanup levels were also detected. It was concluded from testing that approximately 8,650 cubic yards of soil were contaminated at the site. Contaminated soils were excavated and removed from the site during building construction in 1998. In April 1998 Ecology performed a Site Hazard Assessment (SHA) of the site, determined that the property had been extensively remediated, and issued a finding of No Further Action (NFA).

### 2.3 Historical Research

To identify potential sites of concern, Parsons Brinckerhoff reviewed available information to identify historical sites with potential environmental concern. Historical research efforts were directed toward developing an understanding of the type of industries that existed within the study area, probable chemicals of concerns associated with these industries, and potential waste streams.

#### 2.3.1 Sanborn Map Review

Sanborn maps were reviewed and the information gained is included in this section. Appendix A includes Sanborn maps for the following available years:

1893  
1905  
1917  
1919  
1950  
1968  
1969

### 2.3.2 Topographic Map Review

Historical topographical maps provided by Environmental Data Resources, Inc (EDR) did not indicate any areas of concern related to this project. Topographical maps for the following available years are included in Appendix B:

1909  
1949  
1968  
1983

### 2.3.3 Sewer Card Review

Sewer cards were reviewed for properties adjacent to the north and south approaches to the Fremont Bridge. Combined sanitary/storm sewers have serviced the project area since approximately 1929. See Appendix E.

## 2.4 Data Validation

Based on available information obtained from visual observation, government records, and discussions with individuals, additional sampling was recommended and accomplished by Shannon & Wilson, Inc. Their findings are discussed in the report, *Geoprobe Investigation, Fremont Bridge South End Approach Replacement*. The geoprobe report is supplemented by Shannon & Wilson's letter report dated May 20, 2004. This report details the extent of petroleum-impacted soils in the project area (see Appendix H).

Shannon & Wilson conducted a Hazardous Building Materials Survey for the Fremont Bridge Maintenance and Operations Shop, control towers, and bridge approach structures. The findings of the sampling are included in Appendix G.

## 2.5 Site Screening Summary

The study area encompasses a one-mile radius area from the center of the Fremont Bridge span. This area includes all properties within this area, including several past and present industrial, commercial, and residential properties. In total, 11 sites were included in the initial site screening process. Of the 11 sites, ten were eliminated from further consideration because 1) they were located downgradient of or too far away from the planned alternatives; and/or 2) there were no reported environmental concerns that would affect planned construction work.

The City of Seattle Department of Transportation's Operations and Maintenance Building and street right-of-way for the north and south approaches were selected for in-depth analysis. The consultant evaluated the probable extent of contamination in relation to applicable remedial approaches, to consider whether remediation on the site could be "reasonably predictable" or "substantially contaminated." Reasonably predictable sites

are sites where recognized environmental conditions are known based on existing data, or can be predicted based on site observations, previous experience in similar situations, or by using best professional judgment. These sites are typically small, the contaminants are localized and relatively non-toxic, and abatement/remediation activities are routine (e.g., asbestos abatement or petroleum hydrocarbon-contaminated soil remediation). Substantially contaminated sites are typically larger or have large volumes of contaminated materials and a long history of industrial or commercial land use, and the contaminants are persistent, difficult, or expensive to manage. (See Table 1)

**Table 1: List of Properties Assessed**

No.	Address/ Location	Business Name	NPL	RCRA	UST	LUST	FINDS	Substantially Contaminated	Reasonably Predictable	PSI Recommended
1	3303 ½ Fremont Ave N.	Peter Pan Seafoods							X	
2	3406 Fremont Ave N.	Dusty Springs							X	
3	655 N 34 <sup>th</sup> St.	Steel Products, Inc							X	
4	801 N. 34th St.	Quadrant Lake Union Center							X	X
5	3020 Westlake Ave. N	City of Seattle			X			X	X	X
6	711 N. Northlake Way	Growing Green Gardens							X	
7	735 Northlake Way	Speaker Lab								
8	760 N. Northlake Way	Harmon Contract								
9	SR 99 Milepost 34.17	WSDOT Aurora Bridge								
10	2955 Westlake Ave. N.	York Yachts			X	X			X	
11	2930 Westlake Ave. N.	PMC Power & Sail			X	X			X	

## 3.0 Affected Environment

### 3.1 Historical Overview

Land uses on the north and south side of the Fremont Bridge are considerably different and have been broken apart into a historic discussion of land uses for the north and south approaches.

#### 3.1.1 North Approach

The Fremont neighborhood was settled in the 1880s and became part of Seattle in 1891. Historic maps indicate that Lake Avenue (now Fremont Avenue N.) was platted by 1893, with residential housing to the west and the Fremont Milling Company lumber plant to the east. Debris, waste wood, and hog fuel (wood chips) may have been disposed of or wasted in the right-of-way. It does not appear that there was ever any permanent building construction within the right-of-way. (Reference: Appendix A, 1893 maps.)

By 1890, the Seattle Interurban rail system's electric streetcars were crossing between Seattle and Fremont via a wooden trestle bridge.

North of the Fremont Milling Company, Ewing Street (now named N. 34<sup>th</sup> Street) was franchised to the Seattle Lake Shore & Eastern Railroad. There was a rail track just north of the project site and a rail-switching yard immediately to the east.

By 1905 the Fremont Milling Company had been renamed the Bryant Lumber and Shingle Mill Company. (Reference: Appendix A, 1905 maps.)

The wetlands between Lake Union and Puget Sound were dredged in 1916 by the federal government, creating the current alignment for the Ship Canal. With the completion of the Hiram Chittenden Locks in 1917, the wetland area between Fremont and Queen Anne Hill was flooded and ocean-going vessels could enter Lake Union and Lake Washington. The current bascule Fremont Bridge was opened concurrently with completion of the locks. (Reference: Appendix A, 1917 map.)

By 1919 the Bryant Lumber and Shingle Mill had expanded to both sides of Fremont Avenue N. and residential housing on the west side of Fremont Avenue N. had been demolished. The rail line to the north was franchised to the Northern Pacific Railroad (Bothell Branch) and a rail spur from N. 34<sup>th</sup> Street accessed both the west and east sides of the lumber mill. Historic maps indicate a sash and door factory, lumber sheds, scattered lumber storage, and an office on the west side of Fremont Avenue N. A planing mill, drying kilns, machine shop, and sawmill were located on the east side. (Reference: Appendix A, 1919 map.)

By 1950 much of the lumber mill on each side of Fremont Avenue N. had been reconstructed. A new planing and sorting mill was constructed on the east side of Fremont Avenue N., and new work shops and lumber sheds were constructed on the west side. (Reference: Appendix A, 1950 maps.)

By 1968 the lumber mill had been replaced. The former mill buildings on the west side were converted to steel product manufacturing, housewares, and house trailer construction. On the east side was a building/housing tile and floor covering warehouse and a parts warehouse. (Reference: Appendix A, 1968 and 1969 maps.)

### 3.1.2 South Approach

The area on the south approach (Seattle side) of the Fremont Bridge was primarily residential prior to 1917. An Operations and Maintenance Building was constructed by the City of Seattle under the south approach to the Fremont Bridge and is accessed by the “Lower Roadway”.

By 1917 a Shell Oil Company pumping station was constructed immediately south of W. Nickerson Street, across the street from the project site. No commercial development was noted either east or west of the south approach.

Maps from the 1950s indicate a railroad right-of-way under the south approach. Additional buildings had been constructed both east and west of the south approach, but their use is unknown.

## 3.2 Physical Environment

The project area is located immediately adjacent to the Lake Washington Ship Canal. The land surface in this area slopes relatively steeply from Queen Anne Hill to the south and Fremont to the north. The annual precipitation in this area is approximately 35 inches to 50 inches per year and the mean annual temperature is approximately 50° F.

The elevation of the Lake Washington Ship Canal is fairly constant and is controlled between elevation 20.0’ to 22.0’ Mean Lower Low Water (MLLW) datum. The project spans the ship canal and rises up to an elevation approximately 100 feet above the ship canal.

The north approach subsurface conditions reveal 3 to 10 feet of fill consisting of loose to medium dense, silty sand with some gravel and/or organics and wood debris. The fill is underlain by 6 to 19 feet of loose to medium-dense sand with some silty sand or silt layers.

The south approach subsurface conditions reveal approximately 12 feet of a mixture of very loose to loose, silty, gravelly sand, clayey silt, and organic silt. A loose to medium-dense silty sand was encountered from 12 to 22 feet.

A full discussion of the geotechnical investigation was prepared by Shannon & Wilson and is incorporated in Appendix D of the March 2003 *Fremont Bridge Approach Replacement Project, Type, Size and Location Study, Volume II*, prepared for the City of Seattle.

### 3.3 Site-Specific Environmental Concerns

#### 3.3.1 North Approach

In 1998, the Quadrant Corporation demolished all buildings in the areas immediately east of Fremont Avenue N. bounded by the Ship Canal to the south and N. 34<sup>th</sup> Street to the north. The easterly site was subsequently redeveloped for creation of the Quadrant Lake Union Center office complex “East Campus”. The East Campus has mixed office/retail use. Current tenants include Adobe software, Sergio’s Mexican Cuisine, and a coffee shop.

In 2001 Quadrant demolished all buildings in the areas immediately west of Fremont Avenue N. bounded by the Ship Canal to the south and N. 34<sup>th</sup> Street to the north. The westerly site was subsequently redeveloped for creation of the Quadrant Lake Union Center office complex “West Campus.” Like the East Campus, the West Campus has mixed retail/office use. Current tenants include Getty Images, North Star Bank, and Baja Fresh Mexican Grill.

Review of drawings provided by Quadrant for the east and west campuses indicated that the buildings constructed were primarily for office space and street-level retail shops. Building construction included foundation excavation to near the ordinary high lake-level elevation, with numerous auger-cast piling footings below building columns. A temporary sediment collection pond was constructed adjacent to the west side of the north bridge approach.

Work on the east and west campuses included installation of new stormwater conveyance piping, building under-drains, and a coalescing plate oil-water separator. Roof leaders and foundation drains connect downstream of the oil-water separator, and stormwater is discharged to the Ship Canal via a 15-inch concrete pipe outfall.

A portion of the Burke-Gilman Trail was extended along the Ship Canal on both the east and west campus at about the same time.

#### 3.3.2 South Approach

The City of Seattle Department of Transportation (SDOT) Bridge Maintenance staff currently occupies the Operations and Maintenance Building located under the south bridge approach. The site is used for metal storage, cutting, and welding in support of bridge maintenance operations around the City. Bridge electrical maintenance staff also use a portion of the building.

Areas upgradient to the south are primarily residential. Areas along the shoreline adjacent to the south bridge approach have been developed for office and commercial/retail use.

The Ship Canal trail extends west of the Fremont Bridge and connects east of the Fremont Bridge to the dedicated bicycle lane running on Dexter Avenue N.

### 3.3.3 Site Reconnaissance

Site reconnaissance was accomplished on a walk-through the project on June 11 and June 16, 2003. The following observations were noted.

#### 3.3.3.1 North Approach

The entire site under the north approach is paved. Portions are fenced with chain link fencing for storage. Storage includes parking for a Seattle Department of Transportation (SDOT) maintenance truck (cherry picker) and miscellaneous equipment. Other portions are also used for parking.

Several 55-gallon drums are stored under the north approach, including “Nox-Crete Form Coat.” Two blue polyethylene 55-gallon drums capable of storing caustic materials were also noted. No drum labels were noted on the polyethylene drums. A 40-foot storage container was noted on the east side of the north approach near N. 34<sup>th</sup> Street. The storage container is on blocks for long-term storage. No hazardous material placards were noted on this 40-foot container.

All construction work is complete on the east and west campus for the Quadrant Center and the site is fully stabilized.

See Appendix F for site visit photographs.

#### 3.3.3.2 South Approach

The Operations and Maintenance Building located under the south approach was toured at 1:00 pm on June 11, 2003. The following people were present:

DeWitt Jensen, Parsons Brinckerhoff  
William Lider, Parsons Brinckerhoff  
John Dahle, City of Seattle Bridge Maintenance Supervisor

John pointed out the current “oil shed,” a small triangular-shaped building open at one end. Five-gallon buckets of grease and other lubricants were stored in the area. A flammable liquids storage locker was also adjacent to the oil shed.

John noted that at one time there was a trough connected to two buried 55-gallon drums. The drums were stacked on top of each other and presumably used for waste oil storage. The trough has since been removed and the drums have been capped with a concrete slab. It was unknown whether any remedial investigation was done to check for leakage.

John also pointed out an underground storage tank (UST) adjacent to the shop entrance. The tank size is unknown, but it is believed to have contained gasoline and is likely less than 1,000 gallons. The amount of any remaining product in the tank is unknown and the fill port is not accessible. A vent pipe was noted on the side of the building, and old

pipng for a hand pump was run into the Operations and Maintenance Building for fueling vehicles. It is unknown if the tank has been properly closed. The tank has not been used for at least 20 years and was not tagged to allow it to be filled.

Current operations within and adjacent to the shop include metal sawing, cutting, grinding, welding, and burning operations in support of the SDOT Bridge Maintenance staff. SDOT electricians in bridge maintenance support also use a portion of the shop. No known polychlorinated biphenyls (PCBs), oils, or transformers were reported to have been stored on-site and no transformers were observed.

John noted that bridge painters used the building approximately 20 years ago. Solvents used for washing brushes etc. and lead-containing paints may have been disposed of in the old railroad right-of-way area south of the shop, adjacent to the current asphalt Ship Canal trail.

The shop is of brick and mortar construction. It is possible that the mortar could contain asbestos. Vinyl floor tile possibly containing asbestos was also noted in the second-floor restroom. A portion of the concrete wall separating the second-floor maintenance area from the training room has been covered with plaster and could possibly contain asbestos.

Paint on the shop may also contain lead. Many light fixtures within the building are of an age that might contain PCB ballasts.

No distressed vegetation or obvious soil staining was noted. No noticeable odors were observed. No wells were noted during the walk-through tour. Public sewers have served the area since the 1920s.

It was noted that businesses to the west of the south approach include the Bleitz Funeral Home and the Nickerson Street Saloon. To the east of the south approach is the former Wilson Marine repair area, now called PMC Power and Sail. East of PMC Power and Sail are office buildings, including Blue North Fisheries and Blue Sky Counselors.

See Appendix F for site visit photographs.

### **3.4 TELEPHONE INTERVIEWS**

#### **3.4.1 Telephone Interviews**

The following persons were contacted to obtain additional information on past site uses at the City of Seattle Department of Transportation Maintenance Facility and storage areas:

3.4.2 Ed Mortenson  
(206) 386-1505  
SDOT Maintenance and Operations  
June 9, 2003

Per Ed Mortenson, the Maintenance Shop supports bascule bridge operations and primarily provides steel fabrication. Ed has worked there for ten years. Cutting oils are used for band saws, and solvents are occasionally used. Hazardous materials are disposed of via City Safety Officer Steve Feller.

Work also includes steel welding and cutting. No hydraulic presses or hydraulic equipment are on site, with the exception of truck-mounted equipment. Per Ed, the buildings are electrically heated. He did not know of any USTs.

Ed suggested contacting Ron Gephart: (206) 386-4220. Ron is head of the electrical section. He also suggested calling John Dahle (Bridge Maintenance Crew Chief) to arrange a site visit: (206) 386-1581

3.4.3 Ron Gephart  
(206) 386-4220  
SDOT Electrical Shop Manager  
June 9, 2003

Per Ron Gephart, the site is used primarily for storing conduit, wiring, etc. Ron has been there 20-years. He indicated that the site did not store or maintain transformers or other potential PCB containers.

He indicated that there was an old metal oil shed on site, where 30-weight oil, solvents, grease, etc. was stored. It was located next to the cutoff saw.

Ron thought there might have been an old fuel tank or UST on site. He also indicated that there were two old 55-gallon drum “sumps” buried in the ground with a concrete lid on top. The sumps were connected to a drain in the storage area.

3.4.3 John Dahle  
(206) 386-1581  
Bridge Maintenance Crew Chief  
June 11, 2003

See interview comments under site reconnaissance.

### **3.5 Additional Environmental Testing**

Based on the foregoing initial site investigation, additional testing was accomplished by Shannon & Wilson.

#### 3.5.1 Asbestos

Shannon & Wilson conducted a good faith asbestos survey of the Maintenance and Operations Building, bridge approaches, and associated utilities. The asbestos survey was conducted to comply with WAC 296-67-077, PSCAA Regulation III, Article 4 and is required prior to any demolition or renovation activity. An asbestos survey must also comply with AHERA regulation 40 CFR 763 and be performed by an approved asbestos inspector.

The Operations and Maintenance Building is a two-story structure of approximately 2,360 square feet. The first floor is slab on grade. The age of the building is unknown, however it is believed that the building is at least 75 years old.

Suspected ACM materials that potentially could contain various forms of asbestos include:

- Surfacing Materials
- Thermal Insulation
- Floor/Ceiling/Roofing Materials
- Window Caulking
- Mastics
- Electrical Insulation

56 bulk samples were taken and submitted to NVL Laboratories in Seattle. All samples taken were negative, with the exception of five linear feet of friable air cell insulation and thirty linear feet of non-friable mastic.

Qwest Telecommunications lines were inspected but not tested, to avoid damaging the wiring. Per Qwest personnel, it is believed that none of the telecommunications wiring contains asbestos.

Other suspected ACM materials that were not tested include a fire door and some electrical panels. These materials could not be tested without significant disruption to the shop activities. These materials will be inspected prior to demolition and abated if necessary at that time. See Appendix H for a complete listing of sampled asbestos materials.

### 3.5.2 Lead

Lead paint is pervasive throughout the Maintenance and Operations Building. Samples were taken and analyzed for total lead content under EPA method 7420. 56 of 66 samples contained lead exceeding detection limits. Those samples exceeding 0.5 percent lead were then re-analyzed using the Total Characteristic Leaching Procedure (TCLP) per EPA Method 1311. Detectable levels ranged from 21.0 to 21,000 mg/l. In comparison, waste exceeding 5 mg/l TCLP-Lead is considered a dangerous waste under RCRA. These materials will be identified in the construction contract for abatement prior to building demolition.

Lead was also detected in the soils near the maintenance building. The lead in the soil has not been tested under the TCLP, however for the purposes of this report it will also be considered to be dangerous waste. Further testing has been recommended to confirm this assumption. See Appendix H for a complete listing of sampled lead materials.

### 3.5.3 PCBs

The hazardous building materials survey also included inspection of 69 light fixtures containing 166 fluorescent tubes and 89 ballasts. Light ballasts manufactured before the late 1970s typically contained PCBs. Light ballasts after that period contain a note on the ballast label stating, “No PCBs”. The light ballasts without this label are automatically considered to contain PCBs.

Only 18 fixtures could be opened and inspected without disruption to ongoing building operations. Only one inspected ballast did not contain the “No PCB” label. Based on this limited survey, it is assumed that a total of ten PCB ballasts are present at the site. All fluorescent tube light fixtures will be opened and their ballasts inspected prior to demolition to confirm and abate any PCB’s. No other PCB materials were discovered as a result of the hazardous materials survey. See Appendix H for a complete listing of inspected PCB ballasts.

### 3.5.4 USTs

One UST is present near the entrance to the Operations and Maintenance Building. The tank is scheduled to be removed shortly after SDOT Bridge Maintenance vacates the building. Because of the UST location, geoprobe investigation was not possible during the hazardous materials survey. This will be accomplished at the time of the UST removal. The size of the tank has been estimated to be between 500 and 1,000 gallons in volume, however its exact size is unknown. The extent of any petroleum-impacted soils is unknown and will be investigated prior to demolition.

A small sump consisting of two linked 55-gallon drums is also on the site. Again, geoprobe investigation was not possible during the hazardous materials survey due to ongoing investigation.

### 3.5.5 Petroleum Products

Soil and groundwater sampling accomplished by Shannon & Wilson indicates that there are oil-range petroleum hydrocarbons, Volatile Organic Compounds (VOCs), and metals contamination in the soil and groundwater at the south approach. Most detected levels do not exceed Ecology’s cleanup criteria; however naphthalene and tetrachloroethene were detected in the Operations and Maintenance Building sump area and lead was detected in the UST areas at levels that exceed Method A cleanup criteria under the Model Toxics Control Act (MTCA) Chapter 173-340 Washington Administrative Code (WAC). The discovery of these materials was reported by the City of Seattle to Ecology in accordance with WAC 173-340-300 on April 19, 2004. The results are summarized in Table 2.

**Table 2: List of Assessed Project Areas**

Approach	Excavation Location	Contaminants Exceeding MTCA Level A	In-Place Volume CYs	Weight Tons	Recommended Remedial Action
North	Pier 2	Not Detected	0	0	None
North	Pier 3	TPH, PAH	305	460	Landfill or soil burner
North	Pier 4	TPH, PAH	305	460	Landfill or soil burner
North	Pier 5	Not Detected	0	0	Monitor excavation during construction
North	Pier 6	Not Detected	0	0	Monitor excavation during construction
North	Water Quality Vault 1	Not Detected	0	0	Monitor excavation during construction
North	Storm Drain Trench	PAH	185	280	Landfill or soil burner
South	Pier 9A	Not Tested	Unknown	Unknown	Monitor excavation during construction
South	Pier 9B	Not Tested	Unknown	Unknown	Monitor excavation during construction
South	Pier 9C	Not Tested	Unknown	Unknown	Monitor excavation during construction
South	Pier 9D	Not Tested	Unknown	Unknown	Monitor excavation during construction
South	Pier 9E	Not Tested	Unknown	Unknown	Monitor excavation during construction
South	Pier 9.5D	TPH, Lead	27	40	Additional TCLP testing or RCRA Landfill
South	Pier 10A	Not Tested	Unknown	Unknown	Monitor excavation during construction
South	Pier 10C	TPH Lead	27	40	Additional TCLP testing or RCRA Landfill
South	Pier 10.5B	TPH	30	45	Landfill or soil burner
South	Pier 11A	Solvents, VOC's	43	65	RCRA Landfill
South	South Retaining Wall	TPH, BETEX,	27	40	Landfill or soil burner
South	Water Quality Vault 2	Not Detected	0	0	Monitor excavation during construction
<b>TOTAL</b>			<b>949</b>	<b>1,433</b>	

## 4.0 Potential Impacts

This report provides a conservative analysis of potential impacts by reviewing all potential properties that may be required for the Fremont Bridge North and South Approach Replacement. Footing locations and property acquisitions have been decided and site-specific testing has occurred in an attempt to determine the extent and character of hazardous materials that may be present.

Issues identified include asbestos-containing materials, PCBs, lead-based paint, USTs, and petroleum product in the soil and ground water. Impacts considered include:

- **Project Involvement Summary**—potential property acquisition requirements and cleanup;
- **Potential Project Impacts**—cleanup liability, worker safety, construction activities, intersection revisions, USTs, asbestos/lead contamination, hazardous materials spills, secondary impacts, cumulative impacts, and operational impacts;
- **Potential Regulatory Considerations**—regulatory requirements and the potential impacts most likely to affect the entire project and adjacent properties, and;
- **Additional Investigation**—Further investigation work that has been performed as a result of suspected hazardous materials identified during the Initial Site Investigation.

## 4.1 Project Involvement Summary

This section summarizes the City of Seattle’s permanent easement and property acquisitions for this project.

## 4.2 Potential Project Impacts

This section summarizes the potential construction impacts that may affect the right-of-way acquisition based on known or suspected contaminated properties identified. MTCA is commonly used for upland cleanup work in industrial and commercial areas such as this. Cleanup required for this work can likely be accomplished as independent actions by SDOT, with technical review provided by the Department of Ecology on an as-needed basis. Extreme care will need to be exercised during excavation to prevent petroleum-impacted sediment from entering the adjacent Lake Washington Ship Canal waterway. Baker tanks will be required to collect pumped stormwater and groundwater for holding during testing before discharge to the waterway or transfer to an off-site treatment facility for additional treatment. Asbestos and lead abatement and PCB ballast removal will likely be accomplished by the same subcontractor, because the personal protective equipment required is common to the abatement of all three materials.

### 4.2.1 Cleanup Liability

Cleanup liability refers to the immediate or long-term remediation costs associated with property acquisition and/or construction activities conducted on contaminated properties.

Most of the property in the project has been used by or has been under the control of the City of Seattle. Therefore, liability for costs will rest with the City.

Lead-sheathed telecommunications cables and similar utility purveyors will be the responsibility of those owners to remove prior to bridge demolition.

Liability of groundwater generated by dewatering activities can be minimized by the use of watertight shoring and tremie concrete seals. This will help reduce the volume of water that will require treatment.

#### 4.2.2 Worker Safety and Public Health

This section presents potential worker safety and public health considerations related to environmental issues that may arise during construction. It does not address non-environmental health and safety issues such as traffic, working near operating construction equipment, working over water, working from heights, excavation cave-ins, or mechanical safety issues inside the bascule bridge structure.

Common worker health and safety issues that arise on construction projects are toxic vapor accumulations in trenches and confined spaces such as the proposed water quality treatment vault. In most cases, these impacts can be anticipated and monitored in areas of probable contamination. Explosion, fire hazards, and toxic vapors may also be released by construction activities from known, and possibly improperly closed, USTs at the City of Seattle Department of Transportation Maintenance Facility.

Inhalation and ingestion of lead-based paint, lead-sheathed cabling, asbestos-containing materials, and PCBs could have damaging effects on worker health. Inhalation, ingestion, or skin absorption of these materials during demolition can pose serious health hazards to workers and to the adjacent public. Common short-term symptoms of lead poisoning include abdominal pain, headaches, constipation, and joint aches. Exposure to high levels of lead can result in retardation, convulsions, coma, and death. The risks associated with low-level exposure to lead are not well known, so the EPA has adopted policy that there is no safe level of exposure to lead. Exposures to asbestos can result in long-term progressive illnesses including lung cancer, asbestosis, and mesothelioma. PCB material can be absorbed through the skin and may cause cancers.

Bird guano may also pose a risk to workers on this project. Rock dove and cliff swallows are known to nest in the project area. Histoplasmosis is an infectious disease caused by inhaling spores of a fungus called *Histoplasmosis capsulatum* that is found in bird droppings. According to the National Institute for Occupational Safety and Health, before an activity is started that may disturb any material that might be contaminated by *H. capsulatum*, workers must be notified in writing of the personal risk factors that increase an individual's chances of developing histoplasmosis. Such written communication should include a warning that individuals with weakened immune systems are at the greatest risk of becoming infected. These individuals should seek

advice from their health care providers as to whether they should risk exposure to *H. capsulatum* while working on this project.

The Washington State Department of Labor and Industries requires that personnel receive proper training for working with hazardous materials before entering the site. Additionally, 40-hour Hazwoper training pursuant to 29 CFR 1910.120 will be required for all workers involved in the removal, handling, and transporting of hazardous materials. Training includes the use of respiratory protection equipment and donning of appropriate personal protective equipment. See Section 4.6 for information on regulatory requirements for personnel training under WAC 296-62.

### 4.2.3 Construction Impacts

A delay in construction may occur if unknown contamination and/or containers are encountered during construction activities. Sites where unknown contamination may be encountered within the project area include the reasonably predictable sites listed in Table 1. It is unlikely that sites adjacent to or outside of the project impact area could have contamination that migrated from the site into the Fremont Bridge Approach Project area.

Unknown contamination also may be encountered in heavily industrialized areas. Areas with the highest potential for unknown contamination typically occur within properties that have a long and varied history of industrial and commercial uses. The portion of the Fremont Bridge project area that extends under the north and south approaches are areas with the highest potential for containing unknown pockets of contamination.

If a property with unknown/known contamination is acquired or an easement is obtained, construction could be delayed until the contaminated media is characterized and disposed of properly. These types of construction delays can occur because soils, groundwater, and sediment are typically stockpiled and stored on-site until analytical results are returned from the laboratory. Based on testing results, an appropriate disposal facility can be chosen (if necessary) and the contaminated media disposed of off-site.

Construction staging activities may be affected depending on the staging proximity to contaminated media, underground storage tanks, and sediments, etc. Alternative construction techniques such as watertight shoring and concrete tremie seals will be employed to minimize potential earthwork occurring near any of the above-mentioned potential liability sites.

If contamination beyond what has been identified to date were encountered during construction activities, special handling, disposal, and characterization of dewatering effluent and soils would be required. The City of Seattle would be responsible for proper management of any regulated hazardous wastes.

Efforts to characterize the hazardous chemical content of groundwater and the non-hazardous chemical make-up of groundwater within the Fremont Bridge Project area

should also be determined prior to construction activities. Dewatering efforts conducted during the Fremont Bridge Project probably will require permits and pre-disposal treatment to precipitate and remove metals before discharge to the Lake Washington Ship Canal. Disposal costs to discharge dewatering effluent will be the City of Seattle's responsibility.

If not properly managed, lead-based paint on the Operations and Maintenance Building could cause construction delays during demolition activities. Similarly, the need to abate ACM/LBP and PCB ballasts in buildings, if not done in advance, could delay work.

#### 4.2.4 Hazardous Materials Spills

Accidental hazardous materials spills may occur during construction at any point in the project. Construction sites involve various activities, equipment, and materials that can result in the release of hazardous materials to the environment. Traffic detours and lane closures can increase the risk of accidents that may cause third-party spills of hazardous materials. Spills adjacent to the waterway have the highest potential for environmental damage. Specific responses to spills will be identified in the Contractor's Stormwater Pollution Prevention Plan (SWPPP).

### 4.3 Secondary Impacts

Secondary impacts are those that are "caused by an action and are later in time or far removed in distance but are reasonably foreseeable." These impacts, which usually result from the initial action, include changes in land use, water quality, social issues, and population density.

It is not anticipated that there will be any secondary impacts related to hazardous materials as a result of the Fremont Bridge Approach Replacement project. Impacts of this project appear to be limited primarily to those of an operational in nature.

### 4.4 Cumulative Impacts

Cumulative impacts are those that "result from incremental consequences of an action when added to other past and reasonably foreseeable future actions." The cumulative effects of an action may be undetectable when viewed in the individual context of direct or even indirect impacts, but can nonetheless add to other disturbances and eventually lead to a measurable environmental change.

The Fremont Bridge Approach Replacement Project will primarily replace the deficient bridge approaches in kind. Because there will not be an increase in traffic lanes, additional bridge traffic should not increase as a result of this project. Therefore it is not anticipated that there will be any cumulative impacts.

## 4.5 Operational Impacts

Construction improvements to the north and south approaches to the Fremont Bridge will improve traffic operations in this corridor. This will ultimately help reduce the risk of accidents, including spills into the Lake Washington Ship Canal. Demolition of the existing shop and construction of a new Maintenance Facility will include spill response and collection, to prevent the release of hazardous materials used in bridge maintenance operations to the soil, groundwater, and surface water.

Contaminants likely to be associated with stormwater runoff from the Fremont Bridge approaches include fuel, lubricants, heavy metals, compound from rubber tires, and automobile engine coolants such as ethylene glycol. Stormwater water quality facilities will be designed in accordance with the City of Seattle requirements under Title 22.800 Stormwater, Grading and Drainage Control Code. Use of herbicides and pesticides will be prohibited on landscaped areas adjacent to the Lake Washington Ship Canal.

## 4.6 Potential Regulatory Considerations

A number of federal, state, and local regulations relative to hazardous and dangerous materials may require modifications to the design and construction of this project. Regulatory requirements most likely to affect the project and their potential impacts are as follows:

### 4.6.1 Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund) Regulations (Title 40 CFR, Part 300)

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, 42 U.S.C. 9601 et seq., and the Clean Water Act (CWA), 33 U.S.C. 1251-1376 provide that natural resource trustees may assess damages to natural resources resulting from a discharge of oil or a release of a hazardous substance covered under CERCLA. The Superfund Amendments and Reauthorization Act (SARA) of 1986 establishes a comprehensive framework to identify, investigate, and cleanup releases of hazardous substances released to the environment. CERCLA, commonly referred to as Superfund, tracks hazardous waste sites that are inactive and/or abandoned. The sites are tracked from initial discovery to listing on the National Priorities List (NPL). NPL sites are Superfund sites that are determined to be a priority for cleanup and remediation by EPA.

### 4.6.2 Dangerous Waste Regulations (WAC 173-303)

Compliance with waste designation procedures and disposal requirements will most likely affect project construction. Any contaminated materials generated during construction including soil, water, and debris, will have to be properly designated prior to disposal. Wastes generated by the contractor during construction will also require proper designation prior to disposal. WAC 173-303-070 through 173-303-110 includes specific regulations that identify dangerous waste characteristics and criteria. The requirements

for generators of dangerous waste are included in WAC 173-303-170 through WAC 173-303-230. A transporter of dangerous waste must comply with the procedures listed in WAC 173-303-240 through 173-303-250.

WAC 173-303-145 lists the reporting requirements for spills and discharges into the environment. This section of the WAC applies “when any dangerous waste or hazardous substance is intentionally or accidentally spilled or discharged into the environment such that human health or the environment is threatened, regardless of the quantity of dangerous waste or hazardous substance.” The regulations also detail the required procedures for notification and mitigation, should a spill occur.

#### 4.6.3 Model Toxics Control Act (MTCA), Washington Administrative Code 173-340

The MTCA will apply to all materials with environmental contamination that may pose a threat to human health or the environment. MTCA establishes the acceptable cleanup levels for contaminated media. Necessary cleanup will likely be accomplished as an independent action to Level A criteria by the City of Seattle.

#### 4.6.4 State Dangerous Waste Regulations Washington Administrative Code 173-303

Waste designation procedures for State-regulated dangerous wastes are most likely to occur at or near the Seattle Department of Transportation Operations and Maintenance Building, given its past history. Any dangerous wastes uncovered or generated during construction will need to be handled in accordance with WAC 173-303. Any transportation of dangerous waste off site will need to comply with procedures listed in WAC 173-303-240 through WAC 173-303-250.

Reporting requirements for any release of dangerous materials such as spills or discharge to the adjacent waterway require immediate reporting to State and federal agencies and carry significant fines.

#### 4.6.5 Underground Storage Tanks, Revised Code of Washington 90-76 and Washington Administrative Code 173-360

The purpose of this regulation is to address the serious threat posed to human health and the environment by leaking underground storage tanks (USTs) containing petroleum and other regulated materials. Closure requirements, inerting requirements, cleaning, and scrapping are regulated by the Department of Ecology. The contractor removing the UST must also be certified by the Department of Ecology.

#### 4.6.6 Endangered Species Act (ESA)

The ESA regulates a wide range of activities affecting plants and animals designated as threatened or endangered. It is unlawful to “take” an animal listed as an endangered species. “Take” is broadly defined under the ESA to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or adversely

impacting the species habitat. Endangered species known to use the Lake Washington Ship Canal include the Bull Trout and Puget Sound Chinook Salmon, as well as other threatened species.

Any release of hazardous materials during demolition or construction of this project could be construed to be a violation of the ESA.

#### 4.6.7 Federal Migratory Bird Treaty Act of 1918

Cliff swallows, *Petrochelidon pyrrhonota*, are known to be present at this site nesting from March to September. Cliff swallows nesting in colonies under bridge structures can become a nuisance. Their droppings can foul machinery, create aesthetic problems, and cause potential health hazards by contaminating foodstuffs. Their mud nests eventually fall to the ground and can cause similar problems. In addition, swallow nests frequently contain mites and insects such as swallow bugs (*Oeciacus vicarius*). Swallow bugs are related to bedbugs and will bite humans, although humans are not their usual host.

All swallows are included under the Federal Migratory Bird Treaty Act of 1918 as migratory insectivorous birds and as such are protected by state and federal regulations. It is illegal for any person to take, possess, transport, sell, or purchase them or their parts, such as feathers, nests, or eggs, without a permit. As a result, certain activities affecting swallows are subject to legal restrictions. Removals of nests are allowed prior to nesting activities. Once nesting has commenced, state and federal law prohibit disturbance of swallows. Lethal control of swallow nesting colonies is generally only allowed at airports or potential food contamination from a colony, such as over a loading area at a food-processing center. In most cases a permit for lethal control will not be issued for swallows nesting on a residence or other buildings and causing aesthetic damage.

#### 4.6.8 Solid (Non-Dangerous) Waste Disposal Revised Code of Washington 70.95, Washington Administrative Code 173-304

Under the State Solid Waste Management Act, the local government has the primary responsibility for managing solid waste. Under City of Seattle policy, as much of the solid waste such as Portland cement concrete, steel reinforcement, and asphalt will be recycled and removed from the waste stream.

The King County Health Department regulates the handling and disposal of solid waste under this project. The selected Contractor will be required to submit waste disposal sites suitable to accept non-dangerous wastes generated under this project that cannot be recycled. In some cases, testing may be required prior to disposal. Waste shipped outside of King County is also regulated by the local Health Department.

#### 4.6.9 Water Quality Standards for Surface Waters, Washington Administrative Code 173-201A

Toxic materials entering the surface waters of the State are regulated under WAC 173-201A. Toxic substances may not exceed specified natural background levels and shall not be introduced into waters of the State if:

1. The substance will singularly or cumulatively adversely affect the water;
2. The substance will cause acute chronic toxicity to the most sensitive biota dependent on the water;
3. The substance will adversely affect public health.

The Department of Ecology shall employ chemical toxicity testing and biological assessments as appropriate to determine compliance with these requirements.

#### 4.6.10 Safety Standards for Construction Work – Lead, Washington Administrative Code 296-155

WAC 296-155 requires that workers not be exposed to lead concentrations greater than fifty micrograms per cubic meter of air ( $50\mu\text{g}/\text{m}^3$ ) averaged over an eight-hour period. WAC 296-166 also outlines the personal protective equipment that shall be given to employees, and the medical surveillance procedures that are to be implemented for exposed personnel. Lead safety requirements are enforced by the Department of Labor and Industries.

#### 4.6.11 National Emission Standards for Hazardous Air Pollutants (NESHAP)

The Environmental Protection Agency's rules concerning the removal and disposal of asbestos-containing materials (ACMs) are issued under NESHAP. NESHAP requires a thorough inspection for friable ACMs containing more than 1 percent asbestos material. An accredited inspector under the Asbestos Hazard Emergency Response Act (AHERA) must conduct all asbestos inspections. The NESHAP regulation also includes specific notification, work practice, packaging, labeling, and disposal requirements for ACMs.

The Puget Sound Clean Air Agency (PSCAA) requires a written notice of intent to abate or remove ACMs prior to beginning any asbestos removal, disturbance, or building demolition. The only exception are asbestos projects involving less than 48 square feet and the removal of non-friable ACM roofing material. An AHERA building inspector or competent person must make the determination if the material is non-friable. There is a notification waiting period and fee that must be included in planning any asbestos abatement work. ACMs removed from the building must be disposed of at a landfill approved to accept ACM materials.

PSCAA must be notified when asbestos abatement is completed and prior to commencement of any demolition work. Penalties for asbestos violations routinely run into the tens of thousands of dollars.

#### 4.6.12 General Occupational Health Standards – Asbestos, Washington Administrative Code 296-62 Part I-1

WAC 296-62 requires that prior to commencement of work, the owner must conduct a good faith asbestos survey inspection to determine whether materials to be worked on or removed contain asbestos. An AHERA-accredited inspector must conduct the asbestos survey. It is also required that the employer ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter (0.1f/cc) of air during an eight-hour time-weighted average. Beside permissible exposure limits, the regulation also requires appropriate respiratory protection, exposure medical assessment monitoring, and record keeping.

#### 4.6.13 Underground Utilities (RCW 19.122)

There are multiple operating utilities within the project area. The Revised Code of Washington (RCW) 19.122 states that an excavator shall provide notice of the scheduled commencement of excavation to all owners of underground facilities through a one-number locator service. The RCW also states that all owners of underground facilities within a one-number locator service shall subscribe to the service. Notice needs to be communicated to the locator service no less than two days and no more than ten days prior to the commencement of excavation activities. If the excavator discovers utilities that were not identified or damages a utility, the excavator must stop work and notify the locator service and the owner of the utility service if possible. If the damage causes an emergency situation, the excavator will alert the appropriate public health agencies and take all steps necessary to ensure public safety. A failure to notify the locator service of damage to a hazardous liquid or gas pipeline is subject to a civil penalty. Any excavator who willfully or maliciously damages a field-marked underground facility is liable for triple the costs incurred in repairing or relocating the facility.

#### 4.6.14 Puget Sound Clean Air Agency (PSCAA) Regulation I, Article 3

Air quality standards in Seattle are included in the PSCAA regulations. PSCAA enforces the requirements of the Washington Clean Air Act and the Federal Clean Air Act. The PSCAA also enforces the environmental release of asbestos materials.

### **4.7 Further Investigations**

Further investigation of TCLP lead soil is warranted from soils samples obtained. This is recommended to determine whether the material can be disposed of as a regulated waste or a dangerous waste.

Additional investigations of the UST, sump, and other soil in the vicinity of the Operations and Maintenance Building will need to be held in abeyance until such time that the shop can be vacated and partial demolition can occur.

## 5.0 Mitigation

This section presents measures that should be considered to avoid or otherwise control and manage environmental issues that may be encountered during construction. Best professional judgment should be utilized when making assumptions on the quantity and character of contaminated materials being abated.

### 5.1 General

The project entails the construction of piling, underground stormwater quality vaults, and construction of a new City of Seattle Department of Transportation Bridge Operations and Maintenance Building. Therefore necessary cleanup activities should occur prior to construction in order to mitigate long-term cleanup costs, maintenance, and monitoring of the site. Cleanup during construction could result in costly delays. Cleanup costs after construction would likely be exorbitant.

To mitigate cleanup costs, it is recommended that pre-acquisition site investigations be concluded and used to assign fair market value to the property in consideration of long-term cleanup costs.

### 5.2 Environmental Media

Soil, groundwater, and surface water may require special handling during construction. Known areas of contaminated media have been discussed and identified in this report. The exact extent of contamination has yet to be fully resolved. Mitigation options are as follows.

#### 5.2.1 Soil

Space at the construction site will be limited, and due to the proximity of the project to the waterway stockpiling of excavated soil will not be allowed. Contamination above MTCA Level A cleanup will require abatement. Contaminated soil may require off-site stockpiling to allow for cost effective management. Ecology's *Guidance for Remediation of Petroleum Contaminated Soils* is a document that can be used, however it does not account for the higher cleanup levels provided for in amended regulations.

If contaminated soils fail the hazardous waste toxicity characteristics (as determined by the Toxicity Characteristic Leaching Procedure—TCLP), the soils will need to be handled as Washington State dangerous waste. The generator of such waste must obtain an identification number for each “site.” The ID number is obtained by submitting a Form 2 Notification of Dangerous Waste Activities to Ecology. This can be completed after the soil is determined to be a dangerous waste. In such cases it is often easiest to load soil directly into trucks for shipment to the treatment and disposal facility.

Contaminated soils will require stockpiling and testing to assess regulatory classification of the soil. Potential management options are as follows:

- Soils containing contamination below MTCA action cleanup levels may be placed in parking areas or under roadways, if the soil meets geotechnical requirements. It is recommended that no contaminated soil be reused under the proposed Operations and Maintenance Building.
- Soils contaminated in excess of MTCA Level A cleanup levels, but below the dangerous waste criteria, may be transported to a regional solid waste landfill for disposal, as allowed by the King County Health Department.
- Contaminated soils designated as dangerous waste may be transported to a designated landfill that is permitted to handle dangerous waste for stabilization and disposal.

There are several companies in the project vicinity that can dispose of non-hazardous or hazardous waste encountered during construction. TPS Technologies, located in Tacoma, is a thermal disposal facility with specific waste characterization and acceptance procedures. TPS will not accept soils that are designated as state or federal dangerous or hazardous waste. TPS's maximum acceptable concentrations are as follows:

- TPH (Total Petroleum Hydrocarbons): No limit on acceptance
- PAH: No limit on acceptance
- Chlorinated Compounds: 100 ppm total chlorinated
- Other contaminants of concern such as metals have a maximum acceptable concentration depending on the volume of soils to be treated and type of contaminant. These soils are treated on a project-by-project basis. Because acceptance levels may change without notice, the engineer must verify current acceptance levels prior to project bidding.

A second disposal facility is Rabanco Regional Disposal Company. Rabanco can load the contaminated soils into trucks, haul the soil to Tacoma for transfer onto rail cars, then transport the soil via rail to an appropriate landfill. Rabanco's criteria for disposal includes:

- Flashpoint
- Total Lead
- Total Organic Halogens
- TCLP Metals
- BTEX (Benzene, Toluene, Ethyl Benzene, and Xylene)
- PCBs

Rabanco's maximum allowable concentrations are subject to change without notice and must be verified by the Engineer prior to project bidding. Additional TCLP requirements for Volatiles, Semi-Volatiles, and pesticides may also be required.

With the exception of soils failing TCLP lead, all petroleum-impacted soils may either be sent to a licensed landfill or soil absorption facility for treatment.

### 5.2.2 Surface Water

Mitigation measures to minimize potential impacts to surface water include temporary erosion and sediment controls (TESCs) and the Contractor's Spill Prevention Control and Countermeasures (SPCC) plan. The SPCC is discussed at length in Section 5.2.

TESC measures will address procedures, equipment, and materials to avoid erosion during excavation and construction. The City of Seattle *Volume 2: Construction Stormwater Control Technical Requirements Manual*, Title 22.800 Stormwater, Grading and Drainage Control Code provides specific guidance on erosion controls.

### 5.2.3 Groundwater

Vault excavations have been modified to include watertight sheet piling and concrete tremie seal to limit groundwater infiltration into the excavation. Nonetheless it may be impractical to treat groundwater generated by dewatering for trench and vault excavation. Baker Tanks may be required to hold removed groundwater to allow for testing and determination of disposal options. It is unlikely that it will be allowable to discharge contaminated water to the sanitary sewer. Therefore sheetpiling and tremie seals have been elected for this project.

If contaminated groundwater contains regulated hazardous waste, a disposal company that is permitted to handle that type of water will need to be contacted. Each of the disposal facilities will require sampling and other specific testing to determine the cost of disposal and if they will accept the groundwater. Two possible disposal facilities are Philip Services and ENSCO, Inc. If hazardous waste water is generated during construction, a Form 2, Notification of Dangerous Waste Activities, will need to be submitted to the Department of Ecology.

## 5.3 Demolition Debris

Demolition debris will be recycled to the maximum extent possible. The City of Seattle could be liable for future cleanup actions related to contaminants leaching in unlined demolition debris landfills. The determination to use only lined landfills should be based in part on the TCLP characteristics of the demolition debris and the City of Seattle's risk management policy for hazardous waste disposal. Approval of any landfill options should consider whether it is lined or unlined.

The following common debris items can be segregated and recycled as scrap: Steel posts and beams, stairs, railings, doors, windows, and aluminum siding. Gypsum wallboard, concrete, steel reinforcement, and asphalt can also be recycled.

Common demolition debris disposal is not discussed further in this report, with the exception of asbestos-containing materials and lead based paint. See Section 5.5.

## 5.4 Spill Prevention Control and Countermeasure (SPCC) Plan

The SPCC plan will be prepared by the Contractor and designate mitigation efforts to soil, surface water, and groundwater to prevent migration of pollutants. The SPCC plan addresses procedures, materials, and equipment used in the event of a spill of

contaminated soil, petroleum products, contaminated water, or other hazardous substances.

All SPCC plans must include the following elements:

- Introduction
- SPCC Plan Elements
- Designation of the Contractor's Erosion and Spill Control Lead
- Contractor Management Approval
- Site Description
- Planning and Recognition
- Spill Prevention and Containment
- Spill Response Plan
- Reporting Requirements
- Program Management
- Emergency Action Plan
- Site Plan
- Inspection and Incident Reporting Forms

## **5.5 Asbestos-Containing Materials/Lead-Based Paint**

The same Contractor or Subcontractor will likely abate ACM and LBP materials. Repertory and personal protection equipment used to abate ACM and LBP are similar in nature. Likewise, employee testing and air monitoring requirements are similar. An Industrial Hygienist should monitor all work and daily air sampling accomplished (both high-volume area sampling and low-volume personnel sampling). These records should be maintained indefinitely.

## **5.6 Underground Utilities**

Known active and abandoned utilities of record have been shown on the drawings. Per State law RCW 19.122, the Contractor is required to notify the one-call Underground Utility Locate Center 1-800-424-5555 not less than two full business days and not more than ten business days prior to commencement of any excavation. Penalties for not complying with this law may result in fines up to triple the cost of the damage to the utility. The one-call center will only notify those utility purveyors subscribing to this service. Notification of all other non-subscribing utilities and utilities outside the public right-of-way will be the Contractor's responsibility. Under the contract, it is the Contractor's responsibility to protect all utilities from damage, whether shown on the drawings or not.

Additional requirements for underground utility protection under this project are described in Section 1-07.17 Utilities and Similar Facilities of the City of Seattle *Standard Specifications for Road, Bridge, and Municipal Construction*.

## 5.7 Worker and Public Health Safety

Improper use or management of hazardous materials brought to the work site by the Contractor can result in unacceptable workplace exposures. Pre-existing site conditions as discussed herein may also impact worker and public safety. Proper employer training and 40-hour hazardous materials certification will be required of the Contractor.

In an effort to reduce any exposure to the public, the following actions will be implemented.

- Contaminated environmental media and hazardous substances will be contained so they are not accessible to the public. Barricades and 6-foot-high temporary construction chain link fencing with one-strand barbed wire will restrict public access.
- All stockpiled soils will be covered with polyethylene sheeting and secured against wind blow off.
- Drums and temporary storage tanks will be locked and sealed.
- The Contractor will be required to submit copies of all Material Safety Data Sheets (MSDSs) to the Resident Engineer prior to bringing any dangerous or regulated substances on site.
- Transportation of any contaminated media on the right-of-way will be packaged and shipped in accordance with U.S. Department of Transportation (USDOT) requirements.

All personnel entering the project area will be required to read the site-specific Health and Safety Plan (HASP) that will be required under the Contract and to sign a statement indicating that they have read and understand the HASP requirements. Worker exposure to any regulated contaminant shall not exceed permissible exposure levels (PELs) for a regular eight-hour shift unless personal protective equipment is provided, per Section 3.4 of this report.

## 5.8 Underground Storage Tanks (USTs)

A contractor certified by the Department of Ecology for UST removals will accomplish the UST removal. Contractors who perform tank decommissioning are required to have a certification from the International Fire Code Institute (IFCI). Contractors are required to carry proof of certification on site. Ecology does honor IFCI certification from other states.

The regulations (WAC 173-360-385) require that Ecology be notified at least thirty (30) days prior to beginning tank closure. This written notification should be submitted on Ecology's 30-Day Notice form. Contractors must certify that their services comply with the requirements for UST closures by submitting the Temporary/Permanent Closure and Site Assessment Notice form. The Contractor must submit this form to Ecology within thirty (30) days following completion of an UST system closure.

## 5.9 Cumulative and Secondary Impacts

No secondary or cumulative impacts are expected for the Fremont Bridge Approach Replacement project.

## 5.10 Operational Impacts

Operational impacts during construction will be primarily related to controlling surface water runoff from entering contaminated media excavated by the project, and preventing the release of potentially contaminated groundwater.

No long-term operational impacts to the bridge operation are anticipated.

## 5.11 Preliminary Construction Remediation Cost Estimates

Itemized details of cost estimates for construction remediation are presented below. Because conceptual engineering design information is limited for the proposed project alternatives, only unit costs are provided. Cost estimates are based on information available from other construction projects within the Duwamish Waterway corridor.

### 5.11.1 Contaminated Soil

Unit rates for soil management have been estimated for off-site treatment or off-site disposal based on the assumption that non-hazardous contaminated soil would be transported to a thermal treatment facility located in western Washington. The typical unit cost at these facilities is \$35 per ton. Transportation costs are estimated at approximately \$10 per ton plus a \$500 loading fee.

These cost estimates do not include soil characterization costs prior to disposal nor the costs associated with backfill material and placement costs. The characterization costs can differ greatly depending upon the constituent for which the soil is analyzed. Petroleum contamination is one of the most common constituents encountered in soil, and analytical prices are approximately \$50 to \$80 per sample. Non-hazardous petroleum contaminated soil that cannot be disposed of at a thermal facility (e.g., soil contaminated with chlorinated solvents and/or metals) would need to be disposed of at a regional landfill. The cost estimate for disposal at one of these facilities is approximately \$29 per ton combined with a \$95 per hour transportation cost.

Note that within Seattle city limits, there are restricted truck loading and transport times. These rules can greatly impact disposal transport operations and schedules, and consequently impact costs.

The disposal costs for regulated hazardous waste are considerably more expensive than non-regulated contaminated soil. Analytical prices for metal contamination range from \$70 to \$150 per sample depending on EPA methods and individual laboratories.

Analytical prices for characterizing the soil and materials that would likely be encountered at the Fremont Bridge approaches will likely range from \$350 to \$475 per sample depending on EPA methods. To estimate, the cost for removal of soil contaminated with hazardous waste is approximately \$397 per ton. Costs to transport the soil are approximately \$95 per hour and are based on portal-to-portal transportation from Seattle to Arlington, Oregon. The cost estimate will differ depending on the specific characteristics of the soil and the levels of contamination. However, soil highly contaminated with chlorinated solvents and/or PCB and pesticides may require disposal by incineration. These disposal costs can range from \$1200 to \$1800 per ton, plus the disposal fees for regulated hazardous wastes described above.

The above unit costs assume typical conditions and therefore represent a “most likely” estimate for management, treatment, and/or disposal. These estimates do not include the costs of excavation, stabilizing the soils, stockpiling contaminated materials, managing stockpile area runoff, and/or conformation sampling of soil prior to disposal.

#### 5.11.2 Contaminated Groundwater

Unit rates for groundwater management have been estimated for off-site disposal based on the assumption that contaminated groundwater would be transported to an environmental disposal facility in western Washington. King County Department of Natural Resources (DNR) handles dewatering discharges to the stormwater and/or the sanitary systems on a case-by-case basis. Currently King County DNR the unit cost for discharge to the sanitary sewer is approximately \$23.40 per 6000 gallons. Fees provided are based on information listed on King County’s DNR website for industrial wastes: <http://dnr.metrokc.gov/wlr/indwaste/fees.htm>. The estimated groundwater disposal costs (including hazardous waste) anticipated during construction of the proposed Fremont Bridge range from \$ 1.50 per gallon to \$3.50 per gallon. Costs can increase depending on the characterization of the water and the levels of contamination present. Transportation costs can average about \$4 per gallon in the Seattle Area.

Characterization costs are not included in the above disposal costs. The characterization costs can differ greatly depending on the constituent for which the groundwater is analyzed. Petroleum contamination is one of the most common constituents encountered in groundwater and analytical prices range from \$50 to \$80 per sample. A second common constituent in soil is metal contamination, and analytical prices range from \$70 to \$150 per sample depending on EPA methods and individual laboratory prices. Costs to transport the groundwater are about \$80 per hour and are based on portal-to-portal transportation from Seattle. The cost estimate can differ depending on the specific characteristics of the water and the levels of contamination.

The above unit costs assume typical conditions and therefore represent a “most likely” estimate for transportation, treatment, and/or disposal. These estimates do not include costs for dewatering since this cost would be incurred regardless of whether the groundwater was contaminated. Contaminated groundwater generated by dewatering activities may require treatment prior to discharge to the sanitary sewer. It also should be

noted that groundwater within the project area is typically high in natural metal content, which usually prohibits direct discharge to the Duwamish Waterway.

### 5.11.3 UST Decommissioning

One known UST and one sump will need to be removed from a site prior to bridge construction. The estimated cost for decommissioning and removal of a UST (1,000 – 4,000 gallon capacity) can range from \$4,500 to \$12,000. Decommissioning fees typically include excavation of the tank, sampling of soils within the excavation, and completion of any required reporting requirements. The estimates for UST decommissioning do not include cleanup costs if contamination is encountered within the excavation, and do not include the cost of long-term monitoring of groundwater if required.

### 5.11.4 Asbestos-Containing Materials and Lead-Based Paint

ACM and LBP abatement procedures will typically occur at the same time because abatement for LBP is usually only conducted if a representative sample of construction debris (collected during the survey) fail TCLP testing for lead. Lead abatement occurs while the ACM is removed so that construction debris does not have to be handled as a dangerous waste due to leaching characteristics. The types of debris that typically cause TCLP exceedance for LBP are trim and caulking on doors and windows.

Because data on ACM and LBP were not available for the buildings in the project area, a number of assumptions were made to estimate the cost to manage (i.e., survey, abate, and dispose of) ACM and LBP. To determine cost estimates, it is assumed that:

- The average size of residential buildings would be 1,700 square feet.
- The average size of small industrial/commercial buildings would be 4,000 square feet.
- The average size of large industrial/commercial buildings would be 25,000 square feet.
- No previous abatement has occurred in the buildings.
- With the exception of roofing material, ACM could be disposed of at a permitted landfill.
- The asbestos survey cost estimate includes the cost to prepare abatement plans and specifications.
- The asbestos abatement cost estimate includes the cost to oversee and document abatement and disposal.

The unit cost to survey and abate asbestos is estimated to be:

- \$12,000 for residential structures.
- \$14,500 for small industrial/commercial structures.
- \$66,000 for large industrial/commercial structures.

A cost estimate for the abatement of LBP paint for a residence is approximately \$3,000. Assuming a structure that is 1,700 square feet, the per-foot cost for LBP abatement is approximately \$1.75 per square foot. That cost can be used to approximate the abatement costs for LBP in industrial/commercial size structures. The costs for abatement will also differ depending on the amounts of LBP located within or outside of the structure.

Specific sites where LBP was determined to exist are described in the Shannon & Wilson report in Appendix H.

#### 5.11.4 Hazardous Materials Cost Estimate

The following is the estimate of costs based on the visual walk-through of the site and results of the hazardous materials survey performed by Shannon & Wilson. The reader is cautioned that many factors can alter a cost estimate such as schedule requirements, site constraints, level of contamination, and discovery of unexpected or unknown materials. Based on the best available information, the estimated costs for abatement are as follows in Table 3.

**Table 3: Cost Estimates**

No.	Description	Quantity	Unit	Unit Cost	Total
1	UST and Sump Decommissioning	2	EA	\$5,000.00	\$10,000.
2	Asbestos Abatement, Friable	5	LF	200.00	1,000.
3	Asbestos Abatement, Non-Friable	50	LF	40.00	2,000.
4	Dangerous Waste—Lead-Based Paint Removal	18,500	SF	1.75	32,375.
5	Soil Remediation Landfill or Thermal Adsorption	1,000	CY	75.00	75,000.
6	Soil Remediation—Dangerous Waste	100	CY	600.00	60,000.
7	PCB Ballast Removal	10	EA	100.00	1,000.
8	Groundwater Treatment	10,000	Gal	3.50	35,000.
9	Permits	1	LS	\$4,000	4,000.
10	Air Monitoring and On-Site Industrial Hygienist	1,000	HR	40.00	40,000
11	Water/Additional Laboratory Sampling	1	L.S.	25,000.00	25,000.
	<b>TOTAL</b>				<b>\$285,375.</b>

## 5.12 Regulatory Mitigation Operations

### 5.12.1 State Dangerous Waste

Waste and other contaminated environmental media will be handled in accordance with the requirements of the Washington State Department of Ecology (Ecology). Notification of Ecology will be required prior to any abatement work or transporting any

contaminated or regulated materials. Dangerous waste will be shipped off site for treatment and disposal within 90 days of its generation. Removal and disposal of ballasts containing PCBs will be required under Dangerous Waste Regulations.

### 5.12.2 Model Toxics Control Act (MTCA)

Abatement of hazardous media will be accomplished in compliance with MTCA requirements for Level A cleanup. Any cleanup will be accomplished as an “independent action” by the City of Seattle, with technical review by Ecology. Excavations will be minimized to limit the generation of potentially contaminated media. Tremie seals will be placed in excavations below groundwater to help minimize the volume of dewatering storage required.

### 5.12.3 Solid (Non-Dangerous) Waste Disposal

The King County Health Department regulates the handling of solid waste in King County. Lists of all solid waste and recycling facilities within King County can be reviewed at the County’s website at:

<http://www.metrokc.gov/HEALTH/hazard/solidwaste.htm>

To the maximum extent possible, solid waste materials generated by this project will be recycled.

### 5.12.4 General Occupational Health Standards (WAC 296-62)

Measures such as daily air monitoring and personnel air monitoring will be implemented to assure that no atmospheres hazardous to human health are present. Specific worker mitigation measures are outlined in Section 5.6 of this report.

### 5.12.5 Asbestos and Lead Containing Materials

The Puget Sound Clean Air Agency (PSCAA) will be notified in accordance with its policy of filing a notice of intent to remove asbestos materials. All asbestos materials will be removed prior to any demolition work. The work will be accomplished in accordance with Regulation III, Article 4 of the PSCAA requirements.

### 5.12.6 Underground Storage Tanks (USTs)

USTs located near the City of Seattle Department of Transportation Maintenance Facility will be removed during building demolition. UST removal will be accomplished by an Ecology-approved Contractor in accordance with local Fire Department and Ecology requirements.

## 6.0 References

Fremont Bridge Approach Replacement Project, Type, Size and Location Study, Volume I & II, March 2003, Parsons Brinckerhoff

Fremont Bridge Approach Project, Final Initial Site Assessment Technical Memorandum, August 2003, Parsons Brinckerhoff

Geoprobe Investigation, Fremont Bridge South End Approach Replacement, March 2004, Shannon & Wilson

Hazardous Building Materials Survey, Fremont Bridge Maintenance Shop, and Control Towers, May 20, 2004, Shannon & Wilson

Letter Report—Fremont Bridge Project, Contaminated Soil Estimates, May 20, 2004, Shannon & Wilson

City of Seattle, *Standard Specifications for Road, Bridge, and Municipal Construction*, 2003 edition

The City of Seattle, *Title 22.800 Stormwater, Grading & Drainage Control Code*, July, 2000

## 7.0 Limitations and Signatures

The conclusions in the report are based on data and information obtained from a site walk-through by Parsons Brinckerhoff staff, from researching readily and publicly available information, from site and telephone interviews of City of Seattle representatives, and from geoprobe field sampling and reconnaissance by Shannon & Wilson, Inc. The interpretations and conclusions of the properties and sites surveyed are based on the experience of Parsons Brinckerhoff and its subconsultant, Shannon & Wilson, Inc. We have relied on representations and information furnished by the individuals noted in this report with respect to existing operations, property conditions, and past historic uses of these properties. Accordingly, Parsons Brinckerhoff and its subconsultants cannot be responsible for any deficiency, misstatements, or inaccuracy contained in this report as a result of misstatement, omission, misrepresentation, or fraudulent information provided by the persons interviewed or documentation reviewed and referenced herein.

Sampling work performed to determine the nature and extent of hazardous materials was performed and this report was prepared in accordance with generally accepted professional practices for assessment of potentially contaminated sites. Because site conditions can vary greatly over short distances, it is important that workers in the project area be alert for changed conditions varying from those discussed herein. Questions regarding this report and the associated documented research should be addressed to William Lider, P.E.: (206) 382-5260

Respectfully submitted,



William M. Lider, P.E.  
Parsons Brinckerhoff  
999 Third Avenue, Suite 2200  
Seattle, WA 98104









# Topographic Map Index

1. Seattle Quad 1909, Scale 1:62,500
2. Seattle North Quad 1949, Scale 1:24,000
3. Seattle North Quad 1968, Scale 1:24,000
4. Seattle North Quad 1983, Scale 1:25,000







---

**Appendix D**

**Washington State  
Department of Ecology  
Facility/Site Atlas Map  
and Facility Site Detail**









---

## Appendix G Hazardous Building Materials Survey

