

# SCOPE OF WORK FOR FEASIBILITY STUDY

## FRANK WEAR SITE YAKIMA, WA

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The Washington State Department of Ecology (Ecology) is requesting the Contractor to conduct a feasibility study for cleanup alternatives at the Frank Wear Site (the Site).

### **SITE BACKGROUND AND HISTORY**

The Site is situated on 0.16 acres at 106 South 3<sup>rd</sup> Avenue in Yakima, Washington. The Frank Wear Site was a drycleaning business from the early 1940's to 2000. Perchloroethylene (PCE) was used in its early history, and was spilled to both the inside and outside of the building. This Site is part of the larger Yakima Railroad Area (YRRA). The YRRA is six-square miles of numerous contaminated small sites with commingled PCE plumes centered along the Burlington Northern-Santa Fe Railroad.

The Frank Wear Site is bordered by a fenced asphalt parking lot on the north, South 3<sup>rd</sup> Avenue on the east, a children's bookstore on the south, and an alley on the west. Attachment A is a map of the area showing the Site's current monitoring well locations, streets, and local structures.

The Site's geology and shallow upper aquifer consists of unconsolidated coarse grained sands, gravels, cobbles with occasional interbedded lenses of clay and silt. Groundwater flow at a nearby Site was estimated at least  $10^{-2}$  cm/sec., or greater than 345 feet/year.

In the last eight years of Site monitoring, the groundwater level has fluctuated from a maximum of 25 feet below ground surface (bgs) in winter (January through March) to a minimum of 12 feet bgs in late summer/early fall (August through October). Irrigation ditches throughout the Yakima area are charged in late March and are turned off in early October. The charged irrigation ditches have caused these large groundwater level fluctuations and the seasonal change in groundwater flow directions from south-flowing (winter) to east-flowing (summer).

Site investigations by Ecology in 1985 and 1987 confirmed the existence of PCE in the soil. Frank Wear Cleaners was named a potentially liable party by Ecology for the YRRA in 1991. In 1994, Ecology and Frank Wear Cleaners signed an Agreed Order for a remedial investigation (RI). As part of the RI, MAXIM Technologies in 1994 and 1995 oversaw removal and disposal of 610 tons of PCE contaminated soil from the excavation of 11 test pits. They also oversaw a soil vapor survey and the installation of four 35 foot deep, 2-inch on-site monitoring wells. These wells and those added in 1997 and 2005 have been groundwater sampled since February, 1995.

In 1997, an interim action was conducted. Environmental Economic Solutions installed five 4-inch PVC C-Sparge wells and a fifth 2-inch monitoring well to implement the ozone sparging system. It operated off and on during 1997 and 1998 with frequent mechanical problems. The success of the sparging system was inconclusive.

In 2000, the drycleaner building was razed. The building's concrete floor and sub-concrete sediments were excavated.

In March, 2005, five additional 2-inch monitoring wells were installed and four of the five four-inch ozone sparging wells were converted to monitoring wells. All of the Site's 14 wells have been sampled quarterly since July, 2005.

PCE concentrations up to 43,500 ug/L remain in the groundwater beneath the Site and remain elevated downgradient from the Site. Other volatile organics of concern in the Site's soil and groundwater include;

- Chloroform
- cis-1,2-dichloroethene
- Trichloroethene
- 1,1,1-trichloroethane
- 1,1,1,2-tetrachloroethane
- 1,2-dichlorobenzene
- Chlorobenzene
- 1,2-dichloroethane
- trans-1,3-dichloropropene

The MTCA Method B cleanup levels for these contaminants are established for soil and groundwater and are presented in Table 1.

**TABLE 1 – MTCA METHOD B CLEANUP LEVELS (CUL)  
FRANK WEAR SITE FEASIBILITY STUDY**

<b>Chemical Group</b>	<b>Contaminant of Concern</b>	<b>Soil CUL (mg/kg)</b>	<b>Groundwater CUL (µg/L)</b>
VOC	Perchloroethylene (PCE)	19.6	5.0*
VOC	Chloroform	164.0	7.17
VOC	cis-1,2-dichloroethene	800.	80.0
VOC	Trichloroethene (TCE)	90.9	3.98
VOC	1,1,1-trichloroethane	72,000.	7,200.
VOC	1,1,1,2-tetrachloroethane	38.5	1.68
VOC	1,2-dichlorobenzene	7,200.	720.
VOC	Chlorobenzene	1,600.	160.
VOC	1,2-dichloroethane	11.0	0.481
VOC	trans-1,3-dichloropropene	5.56	0.243

\* This is not a MTCA Method B Groundwater Cleanup Level, but a site-specific one.

## **WORK TO BE PERFORMED**

The purpose of the feasibility study is to develop and evaluate cleanup action alternatives to enable a cleanup action to be selected for the Site. This study will assist Ecology in selecting the most appropriate cleanup action that will be implemented at the Site. Ecology will provide background information, coordination, and share all Site details with the Contractor.

Ecology is issuing the Work Assignment to the Contractor for the professional services of a senior engineer and technical support staff. All must have experience with generic containment, pump and treat technology, and in-situ bio and chemical treatment dealing with chlorinated solvents. The Work Assignment consists of an in-depth work plan for Site feasibility study alternatives and content per WAC 173-340-350 (b) and (c).

- Alternative #1 – Containment with Groundwater Treatment: Containment and treatment will continue until contaminant concentrations are low enough to allow for natural attenuation. Containment will include a wall. Groundwater treatment may include a pump and treatment system to prevent wall overflow. Subparts of this alternative may include the following:
  - a. Slurry wall around the perimeter of the Frank Wear property;
  - b. Slurry wall in parts of the Site, to be determined by the Contractor;
  - c. Sheetpile steel wall around the perimeter of the Frank Wear property;
  - d. Sheetpile steel wall in parts of the Site, to be determined by the Contractor;
  - e. Iron reactive wall around the perimeter of the Frank Wear property; and,
  - f. Iron reactive wall in parts of the Site, to be determined by the Contractor.

In subpart (b) and (d), the Contractor will determine the location and minimal size and length of the wall that will prevent contaminated groundwater from the Frank Wear property from migrating into adjacent properties.

- Alternative #2 – In-situ Treatment: Generic in-situ treatment system, consisting of: (1) soil vapor extraction; (2) biodegradation using nutrients and chemical injections; and (3) chemical oxidation. Subparts of this alternative include the following:
  - a. In-situ treatment only; and
  - b. In-situ treatment for removal of chlorinated solvents to MTCA Method B and institutional controls and natural attenuation for other contaminants of concern thereafter.
- Alternative #3 – Source Control and Treatment: Excavation and disposal of PCE contaminated soils, or in combination with subparts of alternative #1 or #2.
- Alternative #4 – To Be Determined: Using the existing file information, the above three alternatives shall be completed for the Site. If there is insufficient data in any particular area of Site geography where the above alternatives can not

be fully addressed, the Contractor shall notify Ecology of this insufficient data and will recommend a method(s) and costs to address it.

The Feasibility Study shall include, but is not limited to:

- Detailed description of each alternative and subparts. The description will include the equipment, infrastructure, and implementation until cleanup is achieved.
- An evaluation of the long-term effectiveness of the four alternatives and their subparts once the alternatives are implemented on the most contaminated part of the Site as defined by the Contractor with Ecology's approval. For each alternative and subpart, the evaluation will model the contamination throughout the Site at five, ten and twenty-year points after the alternative is implemented, as well as the estimated restoration timeframes.
- A detailed cost analysis for each of the four alternatives and respective subparts. The cost analysis will include the cost evaluation and projection for the implementation of the four alternatives until groundwater and soil meet established MTCA cleanup levels. The analysis will take into consideration use of the existing two and four inch monitoring wells at the Site.

## **PROPOSED TASKS AND PERFORMANCE SCHEDULE**

Ecology proposes a schedule for the work period as described below and summarized in Table 2. The Contractor may negotiate a revision of the schedule with Ecology.

### **Task I. Discussion of the Work Assigned**

During the month of March, the Contractor, including the project manager, will meet in Yakima with Ecology to discuss the scope of work, qualifications of staff, schedules, and site background information necessary to complete the Work Assignment. A visit to the Site will occur at this time.

### **Task II. Work Plan**

The Contractor will submit a draft Work Plan for Ecology's review and comments on **April 4, 2007**. Ecology anticipates the approval of the Work Plan by **April 13, 2007**.

### **Task III. Site Information**

The entire Site file will be available to the Contractor in copied form or at the Yakima Ecology office before and after the Task I meeting. This Site file includes:

- Remedial investigation reports
- Groundwater monitoring data, plans, and reports
- Soil sampling reports
- Soil vapor survey
- Interim action work plans/reports

- Supporting documents to the above items
- Contact information of consultants that previously worked on the site
- Correspondence between Ecology and other Frank Wear interests

Task IV. Draft and Final Report

The Contractor will complete a draft feasibility study for Ecology’s review on **June 20, 2007**. The draft feasibility study may be revised to meet Ecology’s approval. Ecology anticipates a final meeting with the Contractor on June 29, 2007. Contingent upon the renewal of Ecology contract C0700036, an amendment to extend this work assignment will be issued at Ecology’s discretion. This extension will allow the final draft of the feasibility study to be submitted to Ecology on **July 30, 2007**. A final feasibility study will be issued based on Ecology’s comments, with a minimum of three copies provided to Ecology.

**TABLE 2 – PROPOSED SCHEDULE  
FRANK WEAR SITE FEASIBILITY STUDY**

<b>Date</b>	<b>Task</b>
Monthly	Progress report submission with invoices
Before March 30	Preliminary Yakima meeting – work assignment discussion, Site tour
April 4, 2007	Draft Work Plan submission for Ecology review and comments
April 13, 2007	Work Plan approval by Ecology
Monthly	Progress report submission
June 20, 2007	Draft Feasibility Study submission
June 29, 2007	Final meeting – discussion and comments on Draft Feasibility Study
July 30, 2007	Final Feasibility Study approval and completion

ASPHALT PARKING LOT

FRANK WEAR SITE

CHILDREN'S BOOKSTORE

SOUTH 3RD AVE.

ALLEY

MIN TIE BOAT SALES

WEST WALNUT ST.

MW-5

MW-7

SHED BLDG. REMOVED

MW-6

MW-2

MW-8

SPW-12

SPW-13

FRANK WEAR CLEANERS BLDG. REMOVED

MW-10

SPW-15

A.W. ANDERSEN & SONS

SPW-14

MW-1

MW-9

MW-4

MW-3

