

## Kennedy/Jenks Consultants

32001 32<sup>nd</sup> Avenue South, Suite 100  
Federal Way, Washington 98001  
253-835-6400  
FAX: 253-952-3435

### Final Interim Action Plan Bonjorni Site Ellensburg, Washington

1 June 2012



TY C. SCHREINER

Prepared for

**Washington State**  
**Department of Ecology**  
**Central Regional Office**  
15 West Yakima Street, Suite 200  
Yakima, Washington 98902

K/J Project No. 1196023\*00

# Table of Contents

---

<i>List of Figures</i> .....	<i>i</i>
<b>Section 1: Introduction</b> .....	<b>1</b>
<b>Section 2: Site Background</b> .....	<b>2</b>
2.1 Environmental Conditions.....	2
2.2 Summary of Existing Data.....	2
2.3 Alternative Actions Considered.....	3
<b>Section 3: Interim Action Objectives</b> .....	<b>4</b>
3.1 Soil Cleanup Levels.....	4
3.2 Site Closure.....	4
<b>Section 4: Interim Action Approach</b> .....	<b>5</b>
4.1 SEPA Checklist.....	5
4.2 Site Preparation Activities.....	5
4.3 Soil Excavation.....	5
4.4 Compliance/Performance Soil Sampling and Chemical Analysis.....	5
4.5 Data Evaluation.....	6
<b>Section 5: Confirmation Groundwater Sampling and Chemical Analysis</b> .....	<b>8</b>
<b>Section 6: Waste Management</b> .....	<b>9</b>
6.1 Excavation Soils.....	9
6.2 Drill Cuttings and Groundwater Waste.....	9
<b>Section 7: Schedule</b> .....	<b>10</b>
<b>Section 8: Reporting</b> .....	<b>11</b>
8.1 Interim Action Report.....	11
8.2 Quarterly Groundwater Monitoring Reports.....	11
<i>References</i> .....	<i>12</i>

## List of Figures

---

- 1 Project Location Map

## **Section 1: Introduction**

---

Ecology is planning on conducting an interim action (IA) at the Bonjorni site (site) to include removal of petroleum hydrocarbon contaminated soil and characterization of site soil and groundwater. The IA is being conducted to limit direct contact of petroleum hydrocarbons to residents and reduce the likelihood of the soil to contaminate groundwater. This IA will also conduct sufficient characterization of the site soil and groundwater to support completion of a remedial action/feasibility study and cleanup action plan if determined to be necessary.

Kennedy/Jenks Consultants (Kennedy/Jenks) has prepared this Interim Action Plan (IAP) in preparation of soil removal and performance soil sampling activities at the site located at 5281 Vantage Highway in Ellensburg, Washington (Figure 1). The remedial action is being conducted to remove petroleum hydrocarbon-impacted soil from the subsurface in support of obtaining site closure.

This IAP is prepared in conjunction with the engineering plans and specifications that will serve as the basis for contractor procurement. The remedial work will be bid in accordance with the Washington State Department of Ecology's (Ecology's) procurement process. This IAP includes a description of the following:

- Pertinent site background information.
- IA objectives.
- IA approach, including soil removal and performance sampling and chemical analysis.
- Confirmation groundwater sampling and analysis.
- Waste management handling and disposal.
- Project schedule and reporting.

A State Environmental Policy Act (SEPA) checklist has been prepared and public review and comment is being requested on a determination of non-significance for the IA.

## **Section 2: Site Background**

---

This section presents a brief summary of site background and environmental conditions pertinent to the development of this IAP. A map of the project site is shown on Figure 1.

### **2.1 Environmental Conditions**

The Bonjorni site (site) is a former gas station that operated from the 1940s through 1970 and is located at 5281 Vantage Highway, Ellensburg, Washington. The site is generally flat, sloping gently toward the southeast. An irrigation ditch flows north-south and is adjacent to the western side of the site. A pond is located approximately 100 feet northeast of the site. A one-bay cinder block garage building, approximately 75 feet long by 30 feet wide, is located about 15 feet north of the former fuel dispenser area. A residential house is located approximately 50 feet north of the garage building.

Four underground storage tanks (USTs) were removed from the fuel dispenser area of the site in the fall of 2000 (Fulcrum 2001). Soil samples were collected and analyzed from the dispenser area excavation as part of the UST site assessment and contained gasoline-range hydrocarbons at concentrations above the Ecology's Model Toxics Control Act (MTCA) Method A cleanup levels for unrestricted land use (Ecology 2007). (Note: The contents of the USTs were not reported in the Fulcrum Site Assessment report; however, based on the analytical results, diesel and heavy oil were not detected.)

The vertical and horizontal extent of petroleum hydrocarbon-impacted soil was not evaluated during tank removal and decommissioning in 2000 (Fulcrum 2001). At that time, it was estimated that approximately 675 cubic feet of hydrocarbon impacted soil exists at the site. In consultation with Ecology, an IA is being performed at the site with the goal of reducing petroleum-hydrocarbon impacted soils to protect groundwater resources and residents from direct contact with petroleum hydrocarbons.

### **2.2 Summary of Existing Data**

Two soil samples collected during the 2000 UST site assessment contained concentrations of gasoline-range hydrocarbons of 5,000 milligrams per kilogram (mg/kg) and 11,500 mg/kg, exceeding the MTCA Method A soil cleanup level of 100 mg/kg (or 30 mg/kg if benzene is present) for unrestricted land use. [Note: Soil samples were not analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) compounds or lead concentrations.]

Groundwater was not encountered during the excavation which was terminated at 8 feet below ground surface (bgs). Depth to groundwater is unknown and is anticipated to vary seasonally with irrigation activities. Groundwater flow direction at the site is not known but assumed to be towards the east-southeast based on local topography.

Based on Ecology's well inventory database, nearby groundwater supply wells are drilled and completed to depths up to 300 feet below grade. An assessment of nearby well construction indicates that wells are screened from approximately 140 to 300 feet below grade in a water-producing gravel and sandstone formation. Multiple clay layers are encountered from the near surface to depths of over 200 feet below grade. The nearest well to the site (based on the database) appears to be located approximate 500 feet north of the site and is 300 feet deep. This well is screened from 240 feet to 300 feet below grade.

There is no additional known documentation of investigations performed at the site.

### **2.3 Alternative Actions Considered**

The two other alternative actions considered during the development of this IAP included:

1. Environmental covenants to prevent direct contact with petroleum impacted soil.
2. Characterization of the site soil and groundwater without soil removal and development of a remedial investigation and feasibility study (RI/FS) and cleanup action plan to address the contamination.

The IA eliminates the need for environmental covenants on the property by removing the petroleum-impacted soil and thereby, protecting human health and the environment. Environmental covenants are limited in effectiveness in protecting public health and inadequate to protect ecological resources; an environmental covenant would not be able to prevent groundwater contamination.

The IA will result in a better and more cost effective characterization of the site than site characterization alone. Adequate information was already available to determine that removal of impacted soil to protect human health and the environment was both cost effective and would result in a more cost-effective characterization of the site.

The IA chosen is more effective than environmental covenants in reducing the threat to human health and the environment and will result in a better and more cost effective characterization of the site. The IA does not preclude other cleanup actions from occurring.

## **Section 3: Interim Action Objectives**

---

In consultation with Ecology, an IA is being performed at the site with the goal of reducing petroleum hydrocarbon-impacted soils to limit direct contact of petroleum hydrocarbons to residents and ecological receptors and reduce the likelihood of the soil to contaminate groundwater. This IA will also conduct sufficient characterization of the site soil and groundwater to support completion of a remedial action/feasibility study and cleanup action plan if determined to be necessary.

### **3.1 Soil Cleanup Levels**

The source of petroleum hydrocarbon-impacted soil at the site is the former fueling station that reportedly operated from the 1940s to approximately 1970. Two areas were excavated during the UST Site Assessment in 2000, Excavation-01 and -02 (Fulcrum 2001). Based on the available analytical results, Excavation-01 was not impacted by petroleum hydrocarbons and does not require further investigation. Soil samples from Excavation-02, the area of the former fuel dispenser, had gasoline-range hydrocarbon concentrations that exceeded the MTCA Method A soil cleanup levels for unrestricted land use. Based on the site assessment performed by Fulcrum, the estimated volume of impacted soil is limited.

For the protection of ecological receptors, cleanup standards at the site may be established based on the simplified Terrestrial Ecology Evaluation (TEE) soil screening levels for petroleum products as listed in the Guidance for Remediation of Petroleum Contaminated Sites (Ecology 2011). The TEE screening levels for gasoline and diesel are as follows:

- Gasoline without benzene - 200 mg/kg
- Diesel - 460 mg/kg.

MTCA Method A and B soil cleanup levels for total petroleum hydrocarbons (TPH) will be used to determine whether the remaining impacted soil is protective of public health and the environment. MTCA Method B soil cleanup levels will be calculated based on the fractionated composition of selected soil samples. In practice, those soil samples displaying the highest residual hydrocarbon concentrations will be submitted for analysis of hydrocarbon fractions. MTCA Method B cleanup levels are based on protection of human health through direct contact. MTCA Method A cleanup levels for petroleum hydrocarbons are based on protection of groundwater. Groundwater will be assessed following the interim action to determine if additional remedial actions are necessary.

### **3.2 Site Closure**

The remedial action is being conducted to remove subsurface petroleum hydrocarbon-impacted soil from the subsurface. After petroleum hydrocarbon-impacted soil is excavated and removed to the extent practical given field conditions (i.e., inaccessibility due to building or encountering groundwater), groundwater will be characterized through a quarterly groundwater monitoring program.

## **Section 4: Interim Action Approach**

---

This section presents a description of soil mass removal and performance soil sampling during IA activities. In general, this will include the excavation of petroleum-impacted soil, disposal of excavation spoils, collection of performance soil samples for laboratory analysis, and backfilling the excavation with clean backfill material.

### **4.1 SEPA Checklist**

The SEPA checklist has been prepared and public review and comment is being requested on a determination of non-significance for the interim action. Ecology is the reviewing agency for the SEPA.

### **4.2 Site Preparation Activities**

Prior to implementation of the IA, preliminary activities will be completed as follows:

- Design documents will be developed, including basic plans and specifications for contractor procurement under an Ecology public works contract.
- Access agreements with the property owners will be obtained by Ecology.
- Kennedy/Jenks Consultants will prepare a Health and Safety Plan (HASP) in accordance with applicable health and safety regulations. The HASP will be prepared under separate cover. The selected contractor will also develop a HASP for their personnel.
- Prior to soil removal activities, the Utility Notification Center will be contacted to identify public underground utilities. In addition, the selected contractor will coordinate with a private utility locating service to locate underground utilities in the work area.

### **4.3 Soil Excavation**

It was estimated during the UST site assessment in 2000 by Fulcrum that approximately 675 cubic feet of petroleum hydrocarbon-impacted soil exists at the site. The impacted soil will be excavated and transported offsite to a permitted landfill/treatment facility. Following collection of performance monitoring samples, the excavation will be immediately backfilled with clean material brought to the site by the selected contractor.

### **4.4 Compliance/Performance Soil Sampling and Chemical Analysis**

Field screening methods, including hydrocarbon sheen and headspace vapor tests, as well as visual and olfactory observations, will be used to evaluate the presence of petroleum hydrocarbon-impacted soils and guide the subsequent removal. To the extent practicable, given field conditions (e.g., inaccessibility due to buildings or encountering groundwater), attempts will be made to remove impacted soils that are encountered. Following completion of

soil removal, compliance soil sampling will be conducted to document the residual petroleum hydrocarbon conditions in the excavation. At minimum, compliance soil samples will be taken from the bottom and each sidewall of the excavation. Sample location will be determined by selecting a worst-case sample based on visual and field screening methods. Compliance soil samples will be submitted for the following analyses:

- Gasoline-range hydrocarbons by EPA Method NWTPH-Gx
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260.

In addition, selected soil samples will also be analyzed for the following compounds in accordance with Ecology guidance (Ecology 2011):

- Methyl tert-butyl ether (MTBE), 1,2-dibromoethane (EDB), and 1,2-dichloroethane (EDC) by EPA Method 8260B.
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C.
- Total lead by EPA Method 6010B.

The compliance soil samples submitted for NWTPH-Gx will be analyzed on a 5-day turnaround schedule. If concentrations of petroleum hydrocarbon compounds in the compliance soil samples exceed cleanup standards, additional total petroleum hydrocarbon fractionation analyses may be performed using volatile petroleum hydrocarbon (VPH) and extractable petroleum hydrocarbons (EPH) methods. In accordance with current Ecology guidance, the recommended number of performance soil samples for analysis of petroleum hydrocarbon-impacted soil using VPH and EPH analytical methods is three for every 101 to 1,000 cubic feet of soil (Ecology 2011).

### **Quality Control**

Quality control measures during soil removal and sampling include calibration of field equipment (i.e. photoionization detector), collection of quality control samples, and laboratory quality control. Field equipment will be calibrated daily and in accordance with the manufacturers' instructions prior to collection of data. Quality control samples will include duplicate soil samples.

## **4.5 Data Evaluation**

Cleanup standards at the site may be established based on the simplified TEE soil screening levels for petroleum products listed in the Guidance for Remediation of Petroleum Contaminated Sites (Ecology 2011) and/or MTCA Method B cleanup standards for unrestricted land use (Ecology 2007). The TEE screening levels for gasoline and diesel are protective of upland plants and animals and are summarized below:

- Gasoline without benzene - 200 mg/kg
- Diesel - 460 mg/kg.



Method B soil cleanup levels for TPH will be calculated based on the fractionated composition of selected soil samples. Compliance with MTCA Method B soil cleanup levels for petroleum hydrocarbons (which evaluates human exposure through direct contact) will be calculated on a sample by sample basis. In practice, those soil samples displaying the highest residual hydrocarbon concentrations will be submitted for analysis of hydrocarbon fractions.

## **Section 5: Confirmation Groundwater Sampling and Chemical Analysis**

---

Four shallow groundwater monitoring wells will be installed and developed to approximately 30 feet bgs. One well will be located upgradient of the excavation and three downgradient. Groundwater confirmation sampling will occur over four consecutive quarters. Groundwater samples will be submitted for analysis of the following:

- Gasoline-range hydrocarbons by EPA Method NWTPH-Gx
- BTEX by EPA Method 8260.

In addition, selected groundwater samples may also be analyzed for the following compounds in accordance with Ecology guidance (Ecology 2011) and based on prior monitoring results:

- MTBE, EDB, and EDC by EPA Method 8260B
- PAHs by EPA Method 8270C
- Total lead by EPA Method 6010B.

Groundwater samples will also be analyzed for nitrate, dissolved iron and manganese, sulfate, and methane to monitor natural attenuation of contaminants and to confirm the effectiveness of the cleanup remedy.

After installation is complete, the top of well casing elevations will be surveyed by a licensed surveyor to a recognized datum.

## **Section 6: Waste Management**

---

This section presents the handling and disposal of waste generated as part of the IA activities. Generated waste will include excavation soils, well installation drill cuttings, and groundwater development and sampling purge water.

### **6.1 Excavation Soils**

Petroleum hydrocarbon-impacted soils excavated as part of the IA activities will be characterized prior to disposal at a licensed Subtitle D landfill facility. Composite soil samples will be collected for characterization from either borings drilled prior to excavation or from soil stockpiles temporarily stored on the site.

### **6.2 Drill Cuttings and Groundwater Waste**

Drill cuttings and groundwater waste generated during groundwater monitoring well installation, and well development and sampling will be contained in separate drums and left onsite pending receipt of analytical results. Following waste characterization, the wastes will be disposed offsite at a permitted facility.

## **Section 7: Schedule**

---

The following schedule is anticipated for performance of this project:

- Contractor bidding (Ecology)
- July 2012 – Conduct IA, install groundwater wells (4 to 5 days)
- August 2012 – Analytical data review, IA reporting, 1<sup>st</sup> quarterly groundwater sampling event
- November 2012 – 2<sup>nd</sup> quarterly groundwater sampling event
- February 2013 – 3<sup>rd</sup> quarterly groundwater sampling event
- March 2013 – 4<sup>th</sup> quarterly groundwater sampling event.

## **Section 8: Reporting**

---

Reporting requirements, including preparation of an IA report and quarterly groundwater monitoring reports, are presented below.

### **8.1 Interim Action Report**

Approximately 4 weeks after receipt of the final analytical results, an IA report will be prepared that provides a description of the soil removal, sampling activities, and sample analytical results conducted for the site. Performance monitoring results will be provided to Ecology as soon as they are available from the laboratory.

The IA report will include the following:

- Summary of soil removal activities, including tabulation of soil volume removed.
- Summary of soil volume transported offsite and identification of the disposal facility.
- Volume of backfilling material brought to the site and the source of that material.
- Summary of laboratory analytical data.
- Summary of field screening observations (i.e., sheen and headspace vapor tests, visual and olfactory observations).
- Site map depicting the extent of the excavation and locations of performance soil samples.

### **8.2 Quarterly Groundwater Monitoring Reports**

Following each quarterly groundwater monitoring event, a brief letter report will be provided to Ecology summarizing the results of monitoring activities.

## **References**

---

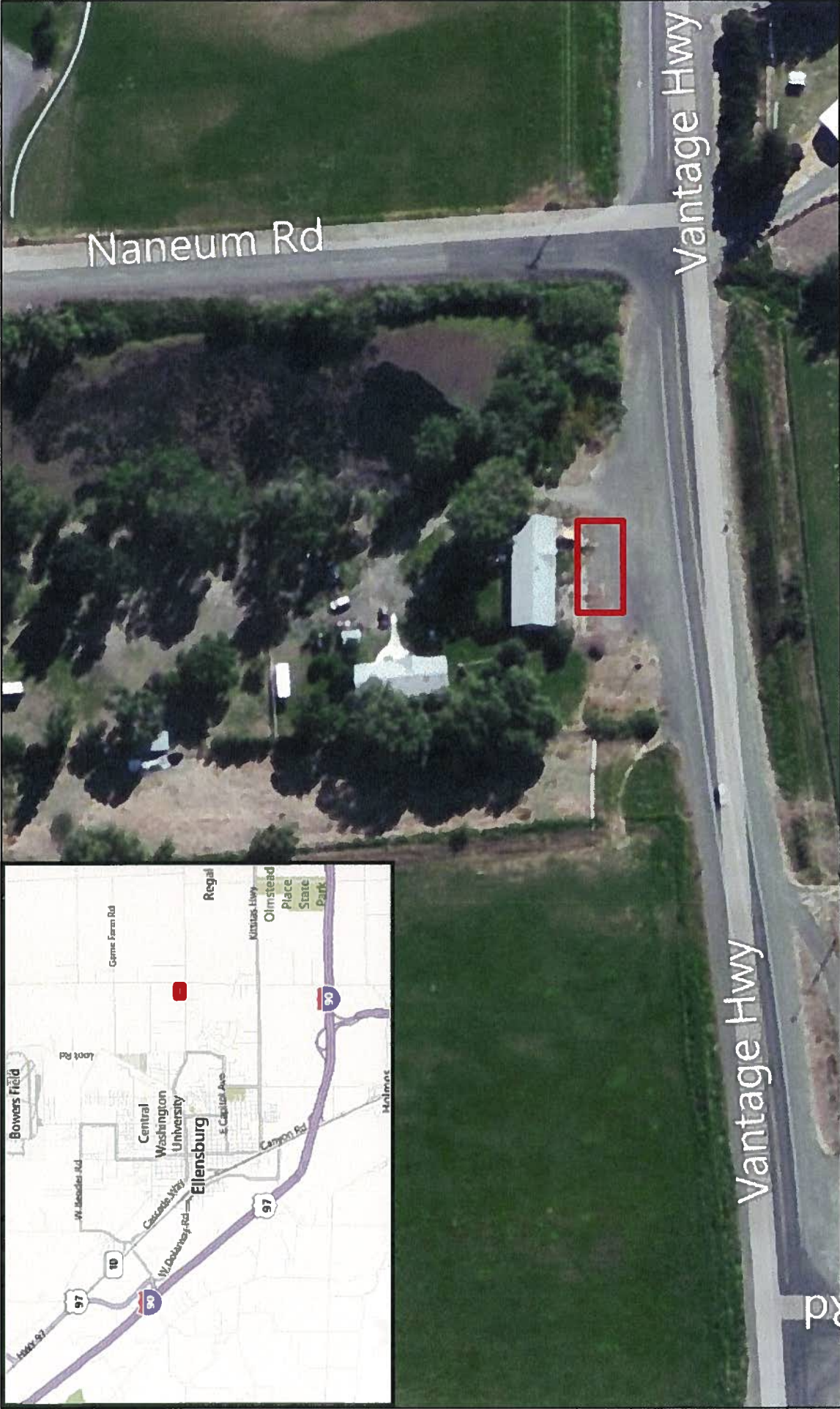
Fulcrum Environmental Consulting, Inc. 2001. Underground Storage Tank Assessment. 26 April 2001.

Washington State Department of Ecology (Ecology). 2007. Model Toxics Control Act Statute and Regulation. Publication No. 94-06. November 2007 (Revised).

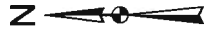
Washington State Department of Ecology. 2011. Guidance for the Remediation of Petroleum Contaminated Sites. Publication No. 10-09-057. September 2011.

**Figure**

---



**Kennedy/Jenks Consultants**  
Bonjorni Site  
Ellensburg, Washington



**Location Map**  
1196023\*00  
February 2012  
Figure 1

 **Project Area**