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June 5, 2003

Michael Boatsman
Washington State Department of Ecology
4601 North Monroe, Suite 202
Spokane, WA 99205

Project Number X01143
WSDOE Enforcement Order Number 02TCPER-4991

PROJECT: Corner Express Texaco
Davenport, WA

SUBJECT: Final Cleanup Action Work Plan

Dear Mr. Boatsman,

At the request of our client (Wheatland Bank, Joe Druffel), we have prepared this Final Cleanup Action work plan for Washington State Department of Ecology (WSDOE) review. This plan is intended to meet the requirements of Exhibit B of the Enforcement Order dated January 22, 2003 for removing the UST system and remediating soil and groundwater at the site.

Site Description and History

The site is located at 1131 Morgan Street in Davenport, Washington on the southwest corner of Morgan Street (Highway 2) and 12th Street. It is bounded by Morgan Street on the north and 12th Street on the west. The Corner Express Texaco operated as a retail gasoline station until it was closed for business in July 2000.

Ecology determined that the underground storage tank (UST) system at this site was not properly closed. Ecology has also determined that the UST system was a likely source of gasoline, as free product, discovered in a groundwater monitoring well immediately downgradient of the site.

There are five (5) underground storage tanks at this site. In certified letters dated June 26 and July 20, 2000, Ecology advised the Potentially Liable Party (PLP), Marvin Bain, of specific non-compliance issues regarding these tanks. In these letters Ecology provided a Notice of Correction and a Compliance Schedule for the tanks to be brought into compliance. Ecology received no response. Among the non-compliance issues, an Ecology inspector noted violations related to the leak detection systems for the piping and the tanks.

In December 2000 Ecology learned of the discovery of gasoline, as free product, in a groundwater monitoring well located less than 100' north and hydraulically downgradient of the site. This well had been installed as part of a Remedial Investigation at a gasoline station which formerly operated directly northeast of Corner Express.

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Ecology issued Emergency Enforcement Order No. DE00TCPER-1901, effective December 26, 2000. This Order directed Marvin Bain to address the potential threat of a continuing release from the UST system by removing all product from the tanks and distributed lines and inspecting the system for any obvious system failures. The limited investigation included a review of inventory records and service, repair, and system testing records.

The investigation conducted under the December 2000 Order resolved the immediate threat posed by petroleum product remaining in the UST system, but it was inconclusive regarding any historical or recent release at the site.

In April 2001 Ecology issued Enforcement Order No. 01TCPER-2689. This order directed Marvin Bain to complete a site assessment to determine if there had been a release at the Corner Express Site. The Order also provided that in the event a release was confirmed, Marvin Bain would complete a remedial investigation/feasibility study (RI/FS). The purpose of an RI/FS is to determine the nature and extent of any release and to identify and evaluate appropriate methods of remediation.

In response to this order, a site assessment/investigation was completed by Budinger & Associates, Inc. in June 2001. This investigation included drilling of soil borings and the installation of 3 monitor wells. This investigation identified petroleum contamination in soil and groundwater at the subject property.

As a result of that investigation Ecology determined that there has been a release(s) of a hazardous substance (petroleum product) associated with the underground storage tank (UST) system at this site. The release(s) has impacted soils and groundwater. The Enforcement Order required additional subsurface exploration and analysis to characterize the nature and extent of soil and groundwater contamination and complete an RI/FS.

This work was undertaken in the late Fall of 2001. It included additional soil borings and installation of 3 additional monitoring wells. The results identified a limited area of soil contamination surrounding the UST system, and a larger area of impact to groundwater. The final RI/FS was submitted to Ecology on January 31, 2002. It included a brief evaluation of the types and feasibility of various remedial options for the site.

Ecology developed a Final Cleanup Action Plan for the site and issued Enforcement Order No. 02TCPER-4991 on January 22, 2003 requiring Marvin Bain to implement the Final Cleanup Action Plan. The plan includes the following actions:

- Removal of the UST system and related piping to the point it enters the pump island
- Excavation and proper disposal of petroleum contaminated soils encountered during UST system removal
- Installation of a groundwater air sparge system and soil vapor extraction system
- Backfilling the excavation with appropriate materials and providing an impervious cover
- Implementing quarterly sampling and chemical analysis of groundwater until remediation is complete
- Imposing a restrictive covenant to ensure that future activity at the site does not adversely impact the remedial action or cause further release or migration of contaminants

This public participation plan has been prepared to promote public awareness and involvement in the final cleanup action plan which is scheduled to be implemented during the spring and summer of 2003.

Work Plan

This work plan describes in general terms the means and methods which will be employed to meet the requirements of the enforcement order. The outline of this work plan follows the format outlined in the Enforcement Order as follows:

Task 1: UST System Removal and Soil Excavation Plan

A properly licensed and certified UST removal contractor will be retained to remove the underground storage tank system in accordance with WSDOE guidelines for decommissioning underground storage tanks systems. The UST contractor will open and check the atmosphere inside the tank with a combustible gas meter and ventilate/inert the tank as necessary. The contractor will follow confined space entry procedures to enter the tank and clean any water or contents if necessary. The product lines will be disconnected and drained. The UST contractor must comply with applicable OSHA/WISHA regulations relating to excavation, construction, confined space entry and other safety and health requirements specific to UST removal.

The contractor will then remove the concrete and manholes overlying the tanks. Concrete and debris will be hauled off site for disposal. Bedding and soil will be removed from above the tanks and the tanks will be removed from the excavation. The tanks will be hauled off site for recycling and disposal. Loose soil will then be removed from the UST excavation.

Pavement will be removed from above the piping along with overburden soils. The piping will be removed from the USTs to the pump island. The surrounding soils and bedding will be excavated until basalt is encountered. The locations of the tanks, lines, and proposed remedial excavation are illustrated on the attached Site Plan.

The excavated soils will be temporarily stockpiled on site. Soils which do not exhibit obvious contamination (petroleum odor, hydrocarbon headspace measurements, discoloration or sheen) will be segregated from obviously contaminated soils if it appears practical to do so. Excavated soils will be sampled for chemical analysis to characterize the materials for disposal. In accordance with WSDOE guidelines, results of chemical analysis from samples obtained during site assessment and characterization suggest that the soils will designate as non-hazardous petroleum contaminated soil. We plan to transport the soils to the Graham Road Landfill for disposal.

Elevated groundwater may be present at the time proposed for UST removal. If water level monitoring suggests that water levels are dropping, we may request the WSDOE to allow additional time to complete the UST removal and UST removal and soil remediation. If it appears that water levels will remain elevated, we will proceed with soil remediation. If dewatering is necessary, the water will be pumped into tanks and be treated on-site (sorbents, air sparging, carbon filtration) until it may be disposed of under permit to the sanitary sewer or hauled off site for disposal.

Temporary fencing, traffic cones, and barricades will be used to prevent the general public and vehicles from accessing the site during UST removal. When practicable, USTs, soils and debris will be placed directly into trucks for transportation off-site. Materials stockpiled on-site will be protected with plastic cover. The contractor will provide appropriate berms, cover and containment to prevent contaminated soil or sediment runoff and to divert stormwater around the UST excavation and stockpiles as necessary.

The tank removal Contractor is responsible for conducting this task and all related activities in accordance with the Underground Storage Tank Regulations (Chapter 173-360 WAC), the Model Toxics Control Act Cleanup Regulation (Chapter 173-340 WAC), Guidance for Site Checks and Site Assessments for Underground Storage Tanks (rev. Oct 1992), Guidance for Remediation of Petroleum Contaminated Soils (rev. November 1995), and any other relevant and applicable requirements. WAC 173-360-385 is attached for reference.

This work will be performed by the following consultants, contractors, and personnel. The WSDOE will be notified in advance if additional contractors or personnel will be retained to complete this project.

Consultant & General Contractor
Budinger & Associates, Inc. (509) 535-8841
Stephen D. Burchett, PE - Project Engineer, Site Supervisor
Thomas Black, EIT – Staff Engineer
Matthew Straub – Environmental Technician
Ethan Hagaman – Environmental Technician
Matthew Free – Laborer

UST Removal & Earthwork Subcontractor
Rob's Demolition - (509) 534-2970
Rob Carper – Owner, Certified UST Decommissioner
Jay Torgerson – Project Manager, Certified UST Decommissioner
Shane Seale – Operator, Certified UST Decommissioner
Randy Keller – Laborer, Certified UST Decommissioner

Electrical Subcontractor
Access Wiring – (509) 991-3019
Frank Seiler – Electrician

Paving Subcontractor
Not yet determined

Task 2: Remedial system design plan
The enforcement order requires the installation of a soil vapor extraction (SVE) system and air sparge system to remediate soil and groundwater. It also requires placing oxygen release compound in the excavation as it is backfilled. The purpose of the SVE system is to extract volatile petroleum hydrocarbons from soils in the vicinity of the UST system, and to provide oxygen to the unsaturated zone to enhance natural biodegradation. The purpose of the air sparge system and the oxygen release compound is to add oxygen to the groundwater which may directly break down some hydrocarbon compounds, and enhances aerobic degradation. It also helps remove volatile petroleum compounds, though to a lesser degree.

The UST's were installed in an excavation created by blasting into the shallow basalt, and the proposed remedial excavation will create a sump into the basalt which will likely contain groundwater for most of the year. It offers a substantial surface area of exposure about the perimeter to soil and rock in the vadose zone, and a substantial area of exposure to the water table. To achieve the purposes of soil vapor extraction and aeration of groundwater, we propose to construct a groundwater treatment system within the backfill of the remedial excavation, and use open-graded, permeable gravel backfill as treatment media.

Specifically, we propose to install perforated piping below the water table to allow collection of groundwater within the excavation. Discharge piping will be installed near the top of the permeable backfill to distribute water back through the gravel media. Air circulation piping will be installed above the water table to allow air movement through the media and soil vapor extraction from the general vicinity. Permeable gravel will also be installed in the product piping excavation along with piping to allow soil vapor extraction. The piping excavation will be isolated from the underground storage tank excavation by backfilling a portion of the trench with concrete or bentonite/cement grout. The surface of the excavation will be covered with an impervious cover (asphalt concrete pavement or durable geotextile membrane) to prevent surface water entry and provide positive control of airflow.

The movement of air and water through the media will allow volatilization of petroleum hydrocarbons and aeration of groundwater within the excavation in the same manner as a conventional air stripper, though with less efficiency. The system will not pump or produce groundwater, or discharge groundwater, but will re-circulate water within the excavation. This is intended to treat groundwater as it naturally migrates through the site. It should provide increased oxygen content downgradient of the system, and by diffusion to groundwater adjacent to and surrounding the system. A general illustration is attached.

This type of system was selected instead of conventional air sparging as it provides a much greater air/water contact area and allows the use of low pressure blowers and pumps which require substantially less energy to operate with lower initial cost. The SVE component is expected to remediate shallow soils and unsaturated rock within the area of influence of the UST and piping excavations.

The piping installed in the excavation is of a flexible design and may be adapted to a number of other treatment alternatives if necessary. The collection piping may be used to produce water for a conventional above grade pump and treat system. Air lines may be installed in the collection piping at a later date to allow sparging of groundwater in the excavation. The collection and distribution piping may be used to inject oxygen release compounds into the excavation. The air piping and water circulation system may be used to inject biological agents and nutrients, allowing the system to be converted into an in-situ bioreactor. Assuming that the system effectively treats groundwater, it may be used to treat water collected from other areas of the site. Additionally, the SVE system may be operated without circulating groundwater, and may be used to raise or lower the adjacent water table by controlling the amount of pressure or vacuum exerted on the subsurface.

We anticipate that the site will eventually be returned to service, and that a new UST system will be installed, probably within the remedial excavation. If it is necessary to continue operation of the system, the piping may be reconfigured to lie below or adjacent to the new tanks as necessary to continue effective operation. Effective operation requires that air be moved in a controlled manner through the treatment media, while water trickles through the media. The location and configuration of pumps, blowers and piping is flexible and may be adjusted to accommodate most any tank configuration. Any proposed change in operation or configuration of the system will be submitted to the WSDOE for review, and will not be implemented without WSDOE approval.

The soil vapor extraction system will vent through the existing UST system vents which are located at the pump island canopy. Due to the relatively low volume of petroleum hydrocarbons to be extracted and the relatively low rate of removal we do not anticipate that treating the exhaust will be necessary. If such is necessary, the exhaust may be treated through a granular activated carbon filter. A "notice of intent" to construct an air pollution source was submitted to the WSDOE for review, and is attached.

The pump and blower will be installed below grade in the remedial excavation in a suitable vault with a traffic rated cover. Electrical service and controls will be located on the outside of the service station structure and will utilize existing UST wiring conduit to the extent practicable.

The performance of the system will be evaluated and monitored by measuring the VOC content of the SVE discharge, pressure of the system and adjacent monitoring wells, oxygen content, pH and conductivity of the circulating water and monitoring wells, and water levels. We expect that oxygen content within the excavation will increase to a relatively stable saturated condition within several weeks of startup, and that oxygen levels in the adjacent monitoring well should also increase, though more slowly. Hopefully, this will be observed in MW#5, MW#13, and priceless MW#8, after continued operation. The VOC content of the SVE discharge should decrease relatively quickly upon startup, and decline to a relatively stable level after several weeks. Gasoline concentrations in the adjacent mw#2 should drop within several months, and concentrations in wells farther away should begin to decrease over the following hydrologic season.

When it appears that the system is no longer reducing VOC concentrations or increasing oxygen concentrations within the system or in the monitor wells, the system will be shut down and monitored. If VOC concentrations return, it will be re-started. The system will be adjusted periodically to evaluate performance and effectiveness. When it appears that it is no longer having a beneficial effect, it will be shut off and the equipment will be removed. We anticipate that this will occur within 2 to 5 years.

Task 3: Sampling and Analysis Plan

Compliance and performance monitoring will be conducted quarterly. Groundwater monitoring will be accomplished by sampling monitor wells #2, #5, Priceless monitor well #8, monitor well #13, and monitor well #30 on a quarterly basis as required by the Enforcement Order. Sampling will be conducted before removal of the UST system and quarterly thereafter until four consecutive quarterly sampling events indicate that contaminant concentrations are below the established cleanup levels of the points of compliance. The points of compliance identified by the enforcement order are MW 2, MW 5, and MW 13. The monitoring wells and points of compliance are illustrated on the Site Plan.

Samples will be collected after purging the monitor wells a minimum of 3 well volumes or until dissolved oxygen content, pH, and conductivity stabilize. Samples will be collected utilizing pre-cleaned disposable bailers or a low flow peristaltic pump and will be transferred into appropriate sample containers provided by the analytical laboratory with minimal agitation. They will be placed in an insulated cooler, maintained at 4°C and transported to the analytical laboratory under chain of custody.

Laboratory analysis will be conducted for the constituents identified in Table 2 of the Exhibit A of the Final Cleanup Action Plan to include total petroleum hydrocarbons (diesel range), total petroleum hydrocarbons (gasoline range), benzene, toluene, ethlybenzene, xylenes, and MTBE. MTBE will be analyzed by EPA Method 8260. Reported field measurements will include depth to groundwater, thickness of free product (if present), dissolved oxygen content, conductivity, and pH.

A WSDOE accredited analytical laboratory will provide a trip blank and perform analysis of duplicate and method blank samples with each batch of samples submitted. The analytical laboratory will perform QA/QC evaluation of the results in accordance with their internal quality assurance program. Duplicate samples will be taken from each well and will be held for analysis if the sample results are questionable or significantly inconsistent with prior results.

Operational monitoring of the groundwater remediation system will include air and water flow rates and volumes, PID measurements of the soil vapor extraction system exhaust, dissolved oxygen content, pH, conductivity of circulating water, and occasional chemical analysis for gasoline and diesel constituents. Monitoring results will be reported to WSDOE within 2 weeks of receipt on a quarterly basis and may be made available at any time upon request.

Waste generated during sampling will be stored on site in 50-gallon DOT drums until the results of chemical analysis are available. Depending on the test results, it will be treated on site, discharged to the municipal sewer system, or transported off site for disposal. Disposable sampling equipment will be thoroughly cleaned, triple rinsed, and disposed of as solid waste.

Task 5: Institutional Control Plan
Direct human contact with contaminated soils left in place will be prevented by the maintenance of the asphalt/concrete cap now in place. A restrictive covenant will be placed on the deed of the property that will condition, any site activity that may cause exposure to contaminated soils. If soils are disturbed during future site activity, impacted soils will be removed and transported off site for treatment. The restricted covenant will be removed once it has been confirmed that soil and groundwater cleanup levels have been attained. The UST closure report will include documentation that the restrictive covenant has been recorded.

Task 6: Public Participation Plan
A public participation plan for the final cleanup action plan is attached.

Task 7: Final Close-out of Cleanup Actions
A final report will be prepared once it has been determined that cleanup at the site has been completed as described in the enforcement order. The final report will summarize remedial activities conducted at the site along with compliance monitoring data and evaluations. The groundwater remediation system will be taken out of service and the pump, blower and electrical components removed when monitoring results indicate that further operation would not be beneficial. Any changes to the system will be coordinated with the WSDOE. A proposed schedule for implementing the final cleanup action plan is attached.

If you have any questions or input for this Work Plan, please call.

Respectfully Submitted:
BUDINGER & ASSOCIATES

Stephen D. Burchett, PE
Environmental Engineer