Interim Remediation Work Plan
AIRPORT KWIK STOP
Greenhouse Road and Highway 31, Ione, Washington

19 October 2012
AGE-NC Project No. 12-2225

PREPARED FOR:

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PREPARED BY:

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1.0. INTRODUCTION AND SCOPE OF WORK

The purpose of this work plan is describe the means and methods for the completion of an interim remedial action in accordance with the specifications in the *Soil Vapor Extraction Specifications and Work Plan* (Specifications - File No. 0504-058-02) prepared for the Washington State Department of Ecology Toxics Cleanup Program - Eastern Region Office (Ecology) by GeoEngineers, Inc. dated 18 July 2012 at the site. The main topics of the scope of work are as follows:

- Site preparation and pre-field work including:
    - Underground utility survey.
    - Installation of temporary facilities and site controls.
    - Installation of erosion and sediment controls.
    - Protection of existing utilities.
    - Preparation of Health and Safety Plan.
    - Preparation of a Noise Control and Air Monitoring Plan.
- Excavation of shallow trenches.
- Installation of Soil Vapor Extraction (SVE) system piping network including piping, valves and manifold.
- Installation of Bioventing system piping, valves and manifold.
- Installation of SVE system equipment (blower and components) to include activated carbon filtration.
- Installation of rental catalytical oxidizer.
- Installation of electrical power and connection of SVE and bioventing system.
- Construction of a fenced and gates remediation enclosure.
- Backfilling trenches with imported fill material.
- Compaction and grading of backfilled trenches.
- Off-site disposal of contaminated soil at a permitted facility.
- Re-paving site excavations.
- Work Zone Plan.

2.0. REQUIRED DOCUMENTATION

In accordance with the Specifications, all persons working at the site during potential exposure to contaminated soil have completed the Occupational Safety and Health Association (OSHA) 40-hour hazardous waste operations training with current 8-hour refresher. Additionally, all AGE personnel have completed training for the 8-hour OSHA hazardous waste operations supervisor.

The following is a listing of the personnel and their OSHA certifications who will be working at the project site:

Name	Certification	Completion Date	Refresher Completed
Robert Marty	HAZWOPER-40 Hour	1992	08 August 2012
Rick Marty	HAZWOPER-40 Hour	1998	08 August 2012
Matt Buckelew	HAZWOPER-40 Hour	2006	08 August 2012
Jason Sackmann	HAZWOPER-40 Hour	2011	01 October 2012
Robert Marty	8-hr OSHA Supervisor	09 September 2012	Not required
Rick Marty	8-hr OSHA Supervisor	09 September 2012	Not required
Matt Buckelew	8-hr OSHA Supervisor	09 September 2012	Not required

Spill Protection, Control and Counter-measure (SCPP) procedures and actions are included in the Temporary Erosion and Sedimentation Control (TESC) and Stormwater Pollution Prevention (SWPP) plan presented in a separate document.

Revisions to the Work Zone Plan will be provided as necessary. Exact specifications for the proposed SVE and bioventing system components and filtration vessels were previously provided.

3.0. SITE PREPARATION AND PRE-FIELD WORK ACTIVITIES

A Health and Safety Plan (HASP) and Noise Control and Air Monitoring Plan have been prepared and are presented in separate documents.

An underground utility clearance will be obtained and a geophysical survey performed to locate underground utilities prior to commencement of any underground work. Results of

the geophysical survey will be available for review at the site.

Specific site controls will be implemented and include:

- Installation of temporary fence surrounding the Exclusion Zone (see Section 8.0. - Work Zone Plan). The location of the temporary fence will not encroach into the clear zone of Highway 31 and be setback 23 feet from the fog line. Required signage warning of physical and chemical hazard and forbidding access to unauthorized personnel will be installed at spacing no greater than 100 feet
- Installation of temporary portable toilet facilities in the Support Zone (see Section 8.0. - Work Zone Plan) and be inspected on a daily basis for maintenance.
- Location of an emergency decontamination and eye wash station.
- Location of sanitary waste disposal containers in the Support Zone.
- Establishment of a Decontamination Zone (see Section 8.0. - Work Zone Plan).
- Maintenance and inspection of all construction equipment. All equipment will be inspected for leaks and spills on a daily basis. Leaks, if to occur, will be repaired immediately and any spills will be cleaned up in accordance with SCPP procedures.
- Prevention of tracking or soil or contaminants outside of the Exclusion Zone. Construction vehicle and equipment consisting of a backhoe and hand tools will remain in the Exclusion Zone. No other vehicular traffic except for the waste bin hauler will be allowed in the Exclusion Zone. All precautions will be taken to ensure the waste bin hauler does not track material outside of the Exclusion Zone; the hauler will drop off the bin before underground work commences and pick up the bin after all surface repairs have been completed.
- Identification of a decontamination pad and a drainage and collection system area for wastewater generated during decontamination procedures. Procedures for decontamination are discussed in Section 8.0. - Work Zone Plan.
- TESC and SWPP procedures are provided in a separate document.

4.0. TRENCHING AND EXCAVATED SOIL HANDLING AND DISPOSAL

A backhoe will be used to excavate the trench for the SVE system piping network. The trench dimensions will be12 to 48 inches wide by 42 inches deep trench. At each well location, trench width will be 12 inches, but at areas where multiple individual piping runs will be placed within the trench, the width will be widened to a maximum of 48 inches where all eight pipe runs are present. The concrete and asphalt cutting will be required in limited

areas. Concrete and asphalt will be segregated and stockpiled in the northern portion of the Exclusion Zone and disposed of or recycled at a licensed facility.

Existing well monuments for wells SVE-1, SVE-2, MP-1 and MP-2 will be removed.

Slope stability of the trenches will be inspected by the Contractor Superintendent to ensure compliance with OSHA regulations and the HASP. Dust control measures will be conducted in accordance with the TESC when necessary. Care will be taken ensure trenching activity does not disturb or damage existing structures or facilities.

Trenches will be sloped to allow condensation that may occur on SVE pipping to flow back toward the remediation wells at a 0.5 ratio (horizontal to vertical).

Impacted excavated soil will be placed in a covered waste bin. Identified 'clean' soil be stockpiled and separated from impacted soil and secured in accordance with TESC procedures. Ecology's representative will seek pre-approval for soil disposal as contaminated, but non-hazardous soil. Properly characterized soil will be hauled by a licensed waste hauler under manifest to the Ecology-approved and licensed waste facility. The waste bin and waste hauler truck will be inspected by the Contractor Superintendent prior to transport off site to ensure no contaminated waste is located on the exterior of the bin or vehicle. Any contaminated waste found on the exterior of the bin or vehicle will be cleaned prior to transport off site (see Section 8.0.).

All completed waste manifests will be submitted to Ecology upon receipt.

5.0. PIPING, WELLHEADS AND MANIFOLDS, AND BACKFILL

An SVE piping manifold will be constructed to connect the remediation wells to the SVE system using 4-inch diameter schedule 80 PVC piping in accordance with the Specifications as shown in Sheet D1.0. A minimum of 10 linear feet of aboveground PVC will extend from the blower to the manifold to allow for heat dissipation of pressurized vapor. Sample ports and vacuum gauges will be installed on the manifold at locations indicated in the Specifications. The manifold will be configured with ball valves rated for 150 psi pressure to connect or disconnect each individual well to the SVE system.

A bioventing manifold will also be constructed and connected to the bioventing system using 2-inch schedule 80 PVC piping in accordance with the Specifications as shown in Sheets C1.1 and Sheet D1.0.

Each remediation wellhead will be fitted with an airtight and locking well cap assembly. SVE piping will be connected to the remediation well as indicated in the Specifications at

approximately 3 feet below surface grade using 4-inch diameter schedule 80 PVC piping (no conduit) for wells SVE-1 through SVE-6 and MP-1 and MP-2 for SVE piping. Wellhead connection bioventing piping will require a tee fitting to connect the 2-inch well diameter to the 4-inch PVC piping.

PVC piping intersections will use a minimum of 2-foot radius sweeps as depicted on Sheet C1.0 of the Specifications.

12-inch diameter steel well boxes (monuments) for wells SV-1 through SV-6 and MP-1 and MP-2 will be set in concrete upon completion of wellhead connections.

Pressure and vacuum gauges, flow indicators, sample ports and valves will be installed on the SVE and bioventing manifolds in accordance with Sheets C1.1 and D1.0 in the Specifications. All remediation piping will be labeled at the manifold with the corresponding well identification.

A twenty-minute airline tightness test will be performed on each 4-inch PVC line after placement in the trench and before connecting to the wellhead. The during the test, 10 psi of air pressure will be applied. If air pressure is lost during the test, leaks will located and repaired.

Once PVC piping network is installed, the trench will be backfilled with at least 6-inches of pipe bedding material that meets WSDOT standard spec 9-03.12(3) - Gravel Backfill for Pipe Zone Bedding. Trenches will be backfilled either suitable on-site soil excavated from the trenches and approved by the Ecology representative or imported structural fill that meets WSDOT standard spec 9.03.14(3) - Common Borrow. Certification that the imported structural fill is not contaminated will be obtained. Pipe zone bedding and trench backfill will be compacted to approximately 95%.

Trenches installed in paved areas will be surface completed with 4 inches of compacted 5/8-inch-minus crushed rock prior to pouring new concrete to match the existing pavement.

6.0. TREATMENT SYSTEM COMPOUND

The treatment system compound will be installed on the south side of the Kwik Stop building and enclosed by a 6-foot high type 3 chain link fence with a double 20-foot swing gate as depicted on Sheet D1.1 of the Specifications. The compound location surface will graded and compacted; the surface area will be composed of 5.8-inch-minus crushed rock with at least a 3-inch lift (ramp) for movement and placement of the treatment system equipment.

The compound will be constructed to accommodate all SVE and bioventing system components, manifolds and treatment vessels. All equipment will have at least 2 feet of clearance. The SVE oxidizer and heat exchanger will be placed within the compound at a location at least 5 feet from the building and storage shed and meet any other manufacturer space restrictions.

A pre-fabricated and insulated storage shed will be constructed to house the SVE and bioventing blowers, knock-out and overflow vessels and electrical control panel. All equipment located in the shed will have a minimum of 2 feet clearance. A ramp will be installed to the equipment shed to facilitate the movement of overflow drums to moved with a drum dolly.

7.0. TREATMENT SYSTEM COMPONENTS

The major components of the treatment system consist of an SVE blower rated at 300 standard cubic feet per minute (scfm) at 12 inches vacuum; heat-taped SVE knock-out vessel; knock-out vessel extraction pump and heat-taped overflow drum plumbed to the extraction pump to allow easy interchange of replacement drums; and pressure and vacuum gauges, flow indicators, temperature gauges, switches, filters, and valves for specified air flow characteristics.

A temporary rental skid- or trailer-mounted catalytic oxidizing treatment system capable of treating vapor concentrations of gasoline-range hydrocarbons between 100 and 16,000 parts per million by volume at 300 scfm with a destruction efficiency of 97% for vapor-phase VOCs will be installed. The unit will be designed to connect directly to the SVE well manifold. The rental oxidizer is designed to be compatible with all SVE equipment and electrical connections and if necessary, to bypass the SVE blower.

Two 2,000-pound granular activated carbon (GAC) polishing vessels will installed. A heat exchanger will also be installed between the oxidizer and the GAC units to reduce the temperature of the oxidizer effluent to less than the manufacturer's recommended operating temperature. A bypass line will be installed directly from the SVE blower outlet to the GAC vessels. Quick disconnects to the oxidizer treatment line piping will be installed.

The rental oxidizing unit will be demobilized upon receipt of seven days notice from the Ecology. Upon demobilization, the SVE effluent piping will be routed to the GAC vessels.

The bioventing system consisting of a blower rated at 100 scfm at 12-inches of pressure with pressure, temperature and level switches and system shutoff controls will be installed and connected directly to the bioventing manifold.

The SVE/bioventing system will connected to the electrical service and a startup and troubleshooting period will be conducted. Successful continuous operation of the SVE/bioventing system for one week will constitute substantial completion of the project. Continued operation and maintenance will be performed by Ecology.

One-phase electrical service will be connected to the system compound by an electrical contractor in accordance with all applicable code. A new dedicated electrical meter and service will be setup with Ecology as the account holder. In addition to connection of all electrical system components, a 110-volt outlet; high level shut-off switch from the knockout vessel and overflow drum; high vacuum shut-off switch for SVE blower; high pressure shut-off for bioventing blower; and automatic system shut-off switch will be installed.

Remote telemetry system, including telephone connection will be installed to alert Ecology if system power is shut down.

8.0. WORK ZONE PLAN

The Exclusion Zone will include the area depicted by the temporary fence on Sheet G1.1 of the Specifications. The Exclusion Zone is an area north of the canopy and a portion of the NE corner of the building and extends to the east to near the clear zone of Highway 31 and then south to north of Greenhouse Road, west to south of the SW corner of the building and then north to the SW corner of the building. The Exclusion Zone perimeter will consist of a locked temporary fence and warning signage as previously described in Section 3.0. There are several designated access points as follows:

- North vehicle access point will be located at the NE corner of the Exclusion Zone. It will be used for initial delivery of the backhoe and impacted soil waste bin, pick up of the waste bin and backhoe and other waste removal activity (after all underground work is completed).
- South equipment access point will be located at the south perimeter near the proposed remediation system compound. It will used for system component delivery, off-load and installation.
- West worker access point will be located at the SW corner at the Support Zone. This will be the most used access point on a daily basis.
- Decontamination Route access point will be located at the NE corner of the building. The personnel decontamination route will be from the Decontamination Zone under the canopy north to the Decontamination Route access point (entry/exit from Exclusion Zone) and then west along the north wall of the building to the Support

Zone and into the Comfort Trailer.

The Support Zone will be located to the west of the Exclusion Zone, north of Greenhouse Road in the area east and south of the garage.

The Decontamination Zone will be located within the Exclusion Zone under the canopy between the east side of the building and the former dispenser islands. The area will be suitable for decontamination of both equipment and personnel, if necessary.

All work will be performed within the Exclusion Zone including excavation, trenching, underground piping network installation, wellhead modification, backfill and surface repair, system compound construction and system installation. Soil stockpiles and the covered impacted soil disposal bin will be located in the northern portion of the Exclusion Zone. Materials will be secured within the Exclusion Zone. The only vehicles allowed in the Exclusion Zone will be the backhoe, the waste disposal transport vehicle (one-time drop-off and pick-up of soil bin) and other one-time waste disposal transport vehicles after all underground work is completed.

The Support Zone will be used for parking of non-construction field vehicles and the Comfort and Safety Trailer. The Comfort and Safety Trailer will house the eye wash station and provide a sheltered break area for workers, to include pressurized water. Additionally, the temporary portable toilet facilities will be located in the Support Zone.

The Decontamination Zone will not be initially constructed, but the location identified as discussed and all necessary material staged. The Decontamination Zone will be constructed under the cover of the canopy and heavy plastic sheeting will be placed on the surface using 8-inch high straw wattles under the plastic to form a containment basin. The equipment staged in the Decontamination Zone are:

- Plastic sheeting.
- Straw wattles.
- Water source and hose with nozzle.
- Sump pump and hose.
- Empty WSDOT approved 55-gallon drums.

In order to prevent contamination of clean areas, personnel may need to have contaminated soil removed from their boots. Personnel will step into the containment basin and hose off their boots. Personnel will exit to the North and then west along the north wall of the building to the Support Zone. A sump pump and hose will be used to pump

decontamination water into a WSDOT approved 55-gallon drum. Plastic sheeting used for the containment basin will be disposed with impacted soil. Care will be taken to ensure splashing of decontamination water does not escape the containment basin.

If clothing becomes contaminated, personnel will be washed within the containment basin and a privacy stall (plastic sheeting) will be erected. Contaminated clothing removed will be evaluated by the Contractor Superintendent for disposal.

If the backhoe or waste disposal truck becomes contaminated with impacted soil, a temporary containment basin will be setup similar as for personnel. The vehicle will enter the containment basin and the contamination will be washed off. A sump pump and hose will be used to pump the decontamination water into a WSDOT approved 55-gallon drum. It is expected that the waste disposal truck will drop-off the waste bin prior to underground work commencing and pick up the waste bin after underground work is completed minimizing potential exposure to contaminants. The backhoe will remain in the Exclusion Zone and during rain events, be parked beneath the canopy. Upon completion of the underground work, the backhoe will be thoroughly cleaned of any contaminants that may have attached to tires and other exterior locations prior to loading and demobilization.

Any solid wastes such as sludge and dirt resulting from decontamination procedures will be placed in the impacted soil waste bin.