Air Quality Management Plan - Soil Vapor Extraction System Installation
AIRPORT KWIK STOP
2111 Highway 31, Ione, Washington

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

PREPARED FOR:

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PREPARED BY:

***Advanced* GeoEnvironmental, Inc.**

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TABLE OF CONTENTS

SECTION		PAGE
1.0.	**INTRODUCTION**	**1**
2.0.	**BACKGROUND**	**1**
3.0.	**PROCEDURES**	**2**
3.1.	SITE EXCAVATION	2
3.2.	WIND MONITORING	2
3.3.	PARTICULATE MONITORING	3
3.4.	VOC MONITORING	5
4.0	**QUALITY ASSURANCE**	**6**

APPENDICES

Appendix A - *Monitoring Field Logs*

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1.0. INTRODUCTION

Advanced GeoEnvironmental, Inc. (AGE) has been contracted by the State of Washington, Department of Ecology to provide installation of a Soil Vapor Extraction (SVE) system at the Airport Kwik Stop, located at 2111 Highway 31, Ione, Washington.

In response to the requirements of this contract, *Advanced* GeoEnvironmental, Inc. (AGE) has developed an Air Quality Management Program, designed to ensure compliance with the approved Interim Action Workplan (IAW) as well as the Department of Ecology's Air Quality Division's limitations on the fugitive emission of particulate matter – Fugitive Dust. For the purposes of this document, Fugitive Dust is identified as airborne particulate matter which has been entrained into the air through anthropogenic (man-made) pathways.

2.0. BACKGROUND

The Airport Kwik Stop, located at 2111 Highway 31, Ione, Washington, previously sold regular and premium gasoline, which was contained in three underground storage tanks (USTs), two of approximately 2,000 gallon capacity and one less than 500 gallons. The smaller tank was emptied and has remained unused since 1984. The two larger USTs were reportedly closed in 1989. The Site continued to dispense gasoline, using above ground storage tanks (ASTs) located behind (west) of the Site. In May 2008, a flex pipe beneath the premium fuel dispenser was observed to be spraying gasoline inside the dispenser. The flex pipe was repaired, successfully tested, and returned to service However, the Site has not sold petroleum since fall 2008.

Recent assessment activities at the site have documented the presence of petroleum hydrocarbon contamination (gasoline) in soil at the Site. Gasoline-range petroleum hydrocarbon (GRPH) contamination in shallow soil extends from less than 2 feet below ground surface (bgs) near the former premium fuel dispenser, to groundwater (about 34 to 38 feet bgs). Concentrations of GRPH in soil samples collected from explorations at the Site have ranged from non-detect to 17,200 milligrams per kilogram (mg/kg), with the highest concentrations from samples located nearest the fuel dispensers. Although the USTs were closed, and the ASTs no longer contain gasoline, gasoline contamination in soil continues to leach downward to groundwater, where it is transported laterally down-gradient with groundwater flow from the site in both liquid-phase form (product) and dissolved in groundwater.

An SVE pilot test recently was conducted to assess the potential effectiveness of an in-situ remediation system in reducing contaminant concentrations in soil at the Site. Two 4-inch polyvinyl chloride (PVC) SVE extraction wells (SVE-1 and SVE-2) and two 2-inch PVC

monitoring points (MP-1 and MP-2) were installed to conduct the pilot test. Total hydrocarbons as gasoline were detected in vapor samples collected during the pilot test at concentrations ranging between 14,700 and 16,500 parts per million by volume (ppmv). Total benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected from the vapor samples at concentrations ranging from 3,470 to 3,960 ppmv.

Based on the results of this pilot test, the State of Washington, Department of Ecology, directed the installation of a Soil Vapor Extraction System at the Airport Qwik Stop at Ione, Washington. The work under this contract will involve the installation of a SVE system, above and below grade piping for the SVE air conveyance lines, removal of material excavated during trenching and disposal at an appropriate facility, and making all electrical and piping connections.

3.0. PROCEDURES

3.1. SITE EXCAVATION

Approximately 10 working days (2 weeks) will be required to complete the project. Monitoring will be conducted during the operation, to be implemented in accordance with the following Rule conditions:

- Monitoring of wind speed and direction;
- Monitoring of particulate levels;
- Monitoring VOC levels during excavation.

3.2. WIND MONITORING

There are no local meteorological stations in Ione, Washington. However, a commercial internet site exists that provides current and forecast weather for the city. AGE staff will access the site at www.wunderground.com and enter Ione, WA as the "site." METAR data, as well as conventional current and forecast data are provided. Wunderground data will be accessed no less than once per hour, or whenever significant changes in the meteorological parameters are observed. Wind Speed, Wind Direction, Temperature and Humidity will be recorded. Log Sheets are provided in Appendix A.

3.3. PARTICULATE MONITORING

The IAW for this project has stated that Total Suspended particulate (TSP) concentrations shall not exceed 5.0 milligrams per cubic meter (mg/m^3). This work plan has been prepared to meet this limit, as well as the requirements of WAC 173-340-820, Sampling and Analysis Plans, modified for real-time analysis. Monitoring at various locations around the perimeter of the work site will measure the total amount of dust present at the monitoring location, but will not specify emissions from the work site. It will include both potential emissions from the construction activity and natural windblown dust. Therefore, monitoring for concentrations of particulate matter will be conducted upwind and downwind of the work site continuously, to record compliance with the emission limits imposed by the IAW and by WAC 173-470, Ambient Air Quality Standards for Particulate Matter. Monitoring for particulates will be conducted in accordance with the protocol approved by the USEPA.

The standard fugitive dust sampling protocols are directed towards filter-based Federal Reference Method (FRM) instrumentation. Use of this methodology will not provide immediate or continuous measurement of the windblown dust levels in the vicinity of this Interim Action project. Therefore, fugitive dust testing will be conducted employing upwind and downwind Thermo Scientific DataRam Aerosol Monitors, Model pdf1000. The DataRam pdf1000 provides real-time measurement of aerosol particles, in a range of 0.001 microns (micrograms per cubic meter, $\mu g/m^3$) to 400 mg/m^3. Sampling at each location will be conducted simultaneously over the work day, but at least over a five-hour monitoring period. The monitoring period will be chosen such that the wind speed is measurable and the wind direction is steady. The monitors shall be placed such that the vector from the upwind to the downwind location corresponds with the prevailing wind direction ($\pm 15^{o}$). A monitoring event will be considered valid if the following conditions are met:

- Each monitor is operated for the duration of the daily construction activity, but no less than five hours (300 minutes);
- The starting and stopping times of the upwind and downwind samplers shall be the same, $\pm$ 10 minutes;
- Each monitor will operate at its calibrated rate of between 1.7 to 2.3 liters per minute, $\pm$ 10%, throughout the monitoring interval;
- The relative direction of the wind will remain constant throughout the sampling period, $\pm$ 15%, such that the upwind/downwind relationship is maintained. Should the wind veer (or back) from its steady-state direction for more than 5 minutes, the location of the downwind monitor will be adjusted such that the upwind-downwind relationship remains valid.

Known performance characteristics of the monitors are critical to the successful collection of valid particulate data. Monitors will be calibrated in accordance with manufacturer's specifications, adhering to the guidelines promulgated in 40 CFR, Part 50. A flow calibration will be conducted on each sampler prior to placement in the field. Single-point side-by-side calibrations of each sampler will be conducted in the field prior to each monitoring event, to ensure the accuracy of the instruments, and to "zero" the upwind instrument. Instruments will be zeroed during calibration, such that side-by-side readings do not vary more than ±5%. Aerosol monitors detect particles in the air down to 0.01 microns (micrograms per cubic meter), including water droplets (fog, humidity, etc.). Zeroing the monitors, or calibrating them to each other, eliminates saturation particles (moisture) from the upwind-downwind calculations, and allows a more accurate determination of the dust emissions.

Quality Assurance will be maintained throughout the period of the contract. Monitor calibration records will be maintained, to determine the overall accuracy and efficiency of the samplers. Maintenance records will be kept on each monitor, in accordance with the guidelines set forth in Sections 2.2 and 2.10 of EPA/600/R-94/038b, *Quality Assurance Handbook for Air Pollution Measurement Systems.*

Fugitive dust sampling will take place daily. TSI DataRam monitors will be placed in upwind and downwind locations prior to the commencement of soil removal. Data collected from these monitors will be recorded at 15-minute intervals. A simple averaging technique will provide hourly concentrations. An action level of 1.0 mg/m^3 (1,000 $\mu g/m^3$) will be established, measured as the difference between upwind and downwind monitors over a one-hour monitoring period. If exceedances of the 1.0 mg/m^3 concentration limit are encountered, indicating an imminent potential exceedance of the WAC limit of 5.0 mg/m^3, additional watering or other appropriate control measures will be implemented to reduce the level of dust generated. Samplers will be started and stopped within ±10 minutes of each other. Samplers will be operated during soil removal activities, or for at least 5 hours in an upwind/downwind configuration. Wind Speed and Direction data will be collected for the period in which the samplers are operated, to complete the vector analysis. The following limitations apply to particulate monitoring:

- Monitoring will not be conducted on days when the sustained (15-minute average) wind speed exceeds 15 miles per hour (mph), or if gusts exceed 25 mph. Monitoring initiated before these limits are reached will be curtailed and the samples annotated as void due to excessive winds.
- Monitoring will not be conducted during periods of rain. If, once monitoring has been initiated, measurable rainfall occurs (>0.1"), the monitoring on that day will be cancelled and the sample records annotated as void due to precipitation.

3.4. VOC MONITORING

Chapter 296-155 WAC, General Safety Orders for Construction Work, requires that monitoring for airborne concentrations of contaminants, such as volatile organic compounds (VOCs), be conducted at regular intervals during the excavation. The approved Interim Action Work Plan for this project also requires monitoring for Volatile Organic Compounds during excavation.

A MiniRae *PLUS* OVA will be used to accomplish the monitoring. The OVA will be calibrated to a hexane standard each morning, prior to initiation of monitoring, in accordance with the manufacturer's instructions and EPA Method 21. The OVA meets the instantaneous monitoring requirements of the Bid Specifications, in that:

- The portable analyzer meets the instrument specifications provided in Section 3 of U.S. EPA Method 21. In addition, the OVA has a minimum detectable limit of 1 ppmv (or lower), audible and visual alarms, and operates at an ambient temperature of 0 - 50° C.
- The OVA calibration gas is hexane, diluted to a nominal concentration of 100 ppmv in air for integrated sample analyses to comply with EPA Method 21.
- The calibration procedures provided in Section 4.2 of U.S. EPA Method 21 will be followed at the beginning of each day before commencing a surface monitoring survey.

Monitoring will be conducted as follows:

- The work face of the excavation will be monitored, along its downwind perimeter. The maximum sustained reading will be recorded every 15 minutes. A Monitoring Log will be maintained on-site for this purpose. Copies of these log sheets are provided in Appendix A. The log includes the date, name of the staff conducting the monitoring, identification and serial # of the OVA, current calibration data, monitored concentrations, and pertinent comments. The log will be retained on-site for the duration of the excavation.
- When taking the readings, staff will place the probe inlet at a distance of no more than three inches from the surface of the excavated soil and while slowly moving the probe across the soil surface, observe the instrument readout. If an increased meter reading is observed, staff will continue to sample the excavated soil until the maximum meter reading is obtained.
- Once every 30 minutes, staff will record the PID reading at breathing height

The following table outlines the monitoring frequency, action levels, and actions to be taken to ensure the safety of on site personnel:

Activity	Contaminant	Monitor	Frequency	Action Level	Action
Environmental Excavation	Volatile Organic Compounds	PID	Continuous from start of shift, recording highest w/i 15 min	Background to <50 ppm at work face; <5ppm at breathing height	Normal work routine and Safety Precautions; Level D or Mod. Level D
Environmental Excavation	Volatile Organic Compounds	PID	Increase recorded peaks to once every 5 minutes until levels drop	>50 ppm but <100 ppm at work face; 5 ppm to 25 ppm at breathing height	All staff upgrade to Level C PPE
Environmental Excavation	Volatile Organic Compounds	PID	Take final readings at workface and in breathing zone; discontinue monitoring	>100 ppm at workface: >25 ppm at breathing height	Stop work. Evacuate area. Apply additional water to site; notify H&S PM

4.0 QUALITY ASSURANCE

To ensure that the data collected is as true and accurate as possible, and that the protocol and results of this project are traceable under standard scientific protocol, quality assurance procedures will be applied to each element of field monitoring. These procedures include:

- Complete calibration records on each sampler. Daily flow checks will be included in each equipment log, for comparison. Multi-point flow calibrations will be conducted if any daily flow check is not within ±10% of the calibrated value. If additional multi-point flow calibrations are required, records of these calibrations will be maintained in the log.
- In order to ensure that procedures are followed uniformly throughout the project, each staff member involved in this project will read this Work Plan and sign the following acknowledgment that the Plan has been read and understood.

APPENDIX A

Monitoring Field Logs

WIND MONITORING RECORDS

Site:_____ **Project No.:** _____**Date:**_____

MONITORING INFORMATION

Data Received From: Wunderground Meteorological Station, Ione, Washington (www.wunderground.com)

Time	Wind Speed	Wind Direction	Temperature	Relative Humidity

Time	Wind Speed	Wind Direction	Temperature	Relative Humidity

WIND MONITORING RECORDS

Site:_____ **Project No.:** _____**Date:**_____

Time	Wind Speed	Wind Direction	Temperature	Relative Humidity

Time	Wind Speed	Wind Direction	Temperature	Relative Humidity

WIND MONITORING RECORDS

Site:_____ **Project No.:** _____**Date:**_____

Time	Wind Speed	Wind Direction	Temperature	Relative Humidity

Time	Wind Speed	Wind Direction	Temperature	Relative Humidity

SIGNATURE:_____ **DATE**:_____

CONTAMINATED SOIL MONITORING RECORDS

Site: _____ **Permit No.:** _____ **Date**: _____

Monitoring Information

Mfg./Model No. _____ **Monitored By:** _____

Calibration Gas: _____ **Telephone No.** _____

Calibration Base Line _____ **Calibration:** _____

Calibration Date: _____ **Calibrated by:** _____

Time	VOC Conc. (ppmv) Highest 15 Min.	Comments

Time	VOC Conc. (ppmv) Highest 15 Min.	Comments

CONTAMINATED SOIL MONITORING RECORDS

Site: _____ **Permit No.:** _____ **Date**: _____

Time	VOC Conc. (ppmv) Highest 15 Min.	Comments

Time	VOC Conc. (ppmv) Highest 15 Min.	Comments

CONTAMINATED SOIL MONITORING RECORDS

Site: _____ **Permit No.:** _____ **Date**: _____

Time	VOC Conc. (ppmv) Highest 15 Min.	Comments

Time	VOC Conc. (ppmv) Highest 15 Min.	Comments

I certify that I possess the appropriate knowledge and training necessary to operate the above listed hydrocarbon monitor in the manner specified by the conditions of this plan. I further certify that the above readings are my measurements and are accurate representations of VOC contamination encountered during soil excavation.

SIGNATURE: _____ **DATE:**_____

PARTICULATE MONITORING RECORDS
Airport Kwik Stop SVE Installation
Ione, Washington
Date: _____

Upwind		Downwind		Particulate Concentration Difference (mg/m^3)	
DataRam Ser #:		DataRam Ser #:			
Time	PM_{10} Conc. (mg/m^3)	Time	PM_{10} Conc. (mg/m^3)	1 Hr	Max

PARTICULATE MONITORING RECORDS
Airport Kwik Stop SVE Installation
Ione, Washington
Date: _____

Upwind		Downwind		Particulate Concentration Difference (mg/m^3)	
DataRam Ser #:		DataRam Ser #:			
Time	PM_{10} Conc. (mg/m^3)	Time	PM_{10} Conc. (mg/m^3)	1 Hr	Max

PARTICULATE MONITORING RECORDS
Airport Kwik Stop SVE Installation
Ione, Washington
Date: _____

Upwind		Downwind		Particulate Concentration Difference (mg/m^3)	
DataRam Ser #:		DataRam Ser #:			
Time	PM_{10} Conc. (mg/m^3)	Time	PM_{10} Conc. (mg/m^3)	1 Hr	Max

PARTICULATE MONITORING RECORDS
Airport Kwik Stop SVE Installation
Ione, Washington
Date: _____

Upwind		Downwind		Particulate Concentration Difference (mg/m^3)	
DataRam Ser #:		DataRam Ser #:			
Time	PM_{10} Conc. (mg/m^3)	Time	PM_{10} Conc. (mg/m^3)	1 Hr	Max