



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OFFICE OF ENVIRONMENTAL CLEANUP
EMERGENCY RESPONSE UNIT

Site Specific Sampling Plan

Project Name: Gorst Creek Removal Action

Site ID: 10GL

Removal Action Phase: Air Monitoring and Sampling

Author: Mark Woodke/Erin Cafferty

Company: E & E

Date Completed: June 6, 2016

This Site Specific Sampling Plan (SSSP) is prepared and used in conjunction with the Quality Assurance Plan (QAP) for the Emergency Response Unit for collecting samples during this Removal Program project. The information contained herein is based on the information available at the time of preparation. As better information becomes available, this SSSP will be adjusted.

When inadequate time is available for preparing the SSSP in advance of the sampling event, a Field Sampling Form may be prepared on-site immediately prior to sampling. This full length version of the SSSP is written after the sampling event and the completed Field Sampling Form attached to it.

1. Approvals

Name, Title	Telephone, Email, Address	Signature
Jeff Rodin, On-Scene Coordinator	206 553-6709, rodin.jeffry@epa.gov USEPA , M/S: ECL-116, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	
Kathy Parker, ERU Quality Assurance Coordinator	206-553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-116, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	

1. Project Management and Organization

2. Personnel and Roles involved in the project:

Name	Telephone, Email, Company, Address	Project Role	Data Recipient
Jeff Rodin	206 553-6709, rodin.jeffry@epa.gov , USEPA , M/S: ECL-116, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	On Scene Coordinator	Yes
Jake Moersen	206 624-9537, jmoersen@ene.com , E & E 720 Third Avenue, Suite 1700 Seattle, Washington 98104	Superfund Technical Assessment and Response Team (START) Field Manager	Yes
Kathy Parker	206 553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-116, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	ERU Quality Assurance Coordinator	Yes
Mark Woodke	206 624-9537, mwoodke@ene.com , E & E 720 Third Ave, Suite 1700 Seattle, WA 98104	START Quality Assurance Reviewer	Yes

Lauren Kerber, Asbestos Laboratory Manager	206 269-6310, TBD, EMSL Analytical Inc., 3317 3 rd Ave S., Suite D, Seattle, WA, 98134	Asbestos and Air Metals Laboratory Contact	No
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3. Physical Description and Site Contact Information:

Site Name	Bremerton Auto Wrecking Landfill/Gorst Creek Removal		
Site Location	4275 State Highway 3 SW, Port Orchard, Washington (See Figure 1).		
Property Size	Approximately 10 acres (See Figure 2).		
Site Contact	Not applicable	Phone Number: Not applicable	
Nearest Residents	Within 0.25 miles	Direction: North and east	
Primary Land Uses Surrounding the Site	Commercial, recreational, residential		

4. The proposed schedule of project work follows:

Activity	Estimated Start Date	Estimated Completion Date	Comments
SSSP Review/Approval	4/26/2016	6/3/2016	
Mobilize to / Demobilize from Site	4/25/2016	9/30/2016	Dates are approximate.
Sample Collection	5/7/2016	9/20/2016	Throughout the project as needed.
Laboratory Sample Receipt	5/9/2016	9/21/2016	
Laboratory Analysis	5/9/2016	9/28/2016	Various turnaround times depending on needs.
Data Validation	5/16/2016	9/29/2016	

5. Historical and Background Information

The Bremerton Auto Wrecking Landfill – Gorst Creek Removal Action property encompasses a triangular parcel centered over approximately 700 feet of the Gorst Creek Ravine (Figure 2). An auto wrecking yard (Airport Auto Wrecking, Too) borders the property to the northeast, and the Washington State Department of Transportation (WSDOT) owns the property adjacent to the landfill to the northwest (downstream), including State Highway 3 SW and an easement corridor on either side of the highway. Gorst Creek flows northwest under the property through an approximate 700 foot-long 24-inch corrugated steel culvert, then under State Highway 3 through a box culvert. The Gorst Creek Landfill was an active facility from the late 1950s until approximately 1987. In 1997, Gorst Creek backed up behind the landfill, flooded, and a portion of the northwest slope of the landfill failed, washing into Gorst Creek down slope of the landfill. Wastes were found approximately one-half mile downstream in Gorst Creek. The site is estimated to contain approximately 150,000 cubic yards of waste. Potential contaminants of concern associated with landfill operations include polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, polynuclear aromatic hydrocarbons (PAHs; a subset of semivolatile organic compounds (SVOCs), gasoline-range total petroleum hydrocarbons (TPHs), diesel-range TPHs, asbestos, and volatile organic compounds (VOCs). In 2011, EPA performed an Engineering Evaluation/Cost Analysis to determine potential alternative actions to be taken at the site. Based on potential threats of site contaminants to human health and the environment, EPA decided to perform a time-critical removal action at the site which includes removal of the 150,000 cubic yards of waste.

This SSSP addresses the air sampling and monitoring for the removal action and is the second of several that will be used to support the removal action. The following is the current list of the removal action SSSPs:

1. Baseline/background sampling.
2. Air sampling/monitoring.
3. Waste profile sampling (excavated material for the landfill and suspect ACM).
4. Stormwater/surface water monitoring.
5. Post-excavation confirmation sampling.

References:

Ecology and Environment, April 2012, Final Draft Engineering Evaluation/Cost Analysis, Bremerton Auto Wrecking Landfill - Gorst Creek Site, prepared for the United States Environmental Protection Agency, Seattle, Washington, Contract Number EP-S7-06-02, Technical Direction Document Number 11-11-0005.

Hart Crowser, Inc., October 2000, Site Hazard Assessment Gorst Landfill, prepared for the Department of the Navy, Engineering Field Activity Northwest, Naval Facilities Engineering Command, Contract Number N44255-98-D-4409.

Kitsap County Health Department, Various Dates, Site files for the Gorst Creek – Bremerton Auto Wrecking Landfill.

United States Environmental Protection Agency, January 2003, Geographic Information Query System for Gorst Creek – Bremerton Auto Wrecking Landfill.

6. Conceptual Site Model

Contaminants: VOCs, PAHs, PCBs, TAL metals and potentially asbestos

Transport Mechanisms: Direct contact with excavated materials, soils and/or sediments, migration to groundwater or surface water, vapor or particles (including potentially asbestos and lead) moving on air currents

Receptors: People on site, people using groundwater or surface water sources, people downwind of the site, and ecological receptors in the creek downstream of the site

7. Decision Statement

The decision(s) to be made from this investigation is/are to:

Air Monitoring (Up to 6 predetermined fixed locations) – Determine whether dust and VOCs are present at concentrations exceeding screening levels (see Attachment A) for health and safety purposes.

Air Sampling (Up to 6 predetermined fixed locations [same locations as above] and 4 mobile locations) - Determine whether asbestos and/or lead is present at concentrations exceeding action levels for health and safety purposes.

8. Action Level

Air Monitoring

The health and safety action levels for VOCs in air during sampling and removal activities in the landfill will be 1 part per million (ppm) for unknown gases using a field portable combination photoionization/ flame ionization detector (PID/FID). If 1 ppm is exceeded, the UltraRAE instrument will be utilized with benzene-specific tubes. If 1 ppm is exceeded using the UltraRAE, Level C personal protective equipment (PPE) with respiratory protection for VOCs will be utilized. If the concentrations of VOCs using the UltraRAE with benzene-specific tubes is less than 1 ppm, then the VOC action levels will be as listed below (provided that air monitoring and/or air sampling results for other parameters does not indicate that a more protective PPE level is needed).

0-5 parts per million (ppm)	Level D
>5-500 ppm	Level C
>500 ppm	Level B

Additionally, if sustained detections of unknown VOCs are encountered, START will attempt to identify the gas so that a compound-specific action level can be developed.

For dust in air during general excavation activities in the landfill, the health and safety action level is 1 mg/m³ with a DataRAM 4 particulate monitor. This action level was derived from the Occupational Safety and Health Administration (OSHA) permissible exposure level (PEL) of 5 mg/m³ as a time-weighted average (TWA) for respirable particulate—not otherwise regulated, and applying a conservative safety factor of 5.

Analytical results from waste profile sampling indicated elevated Toxicity Characteristic Leaching Procedure (TCLP) lead concentrations in the waste being sent off-site for disposal, which indicates that total lead concentrations are likely elevated in the waste. Because of the potential for lead to become airborne, dust monitors in the vicinity of waste excavation and handling activities will be compared to the OSHA PEL for dust of 0.05 mg/m³ (50 micrograms per cubic meter (µg/m³) as a TWA. Note that the use of the OSHA PEL for lead as an action level for dust monitoring is conservative and assumes that 100% of the airborne particulates is lead.

The following action levels will also be applied to air monitoring samples: hydrogen sulfide (20 ppm), carbon monoxide (35 ppm), percent oxygen (<19.5% or > 23%), the lower explosive limit (LEL) with respect to methane (> 10%), and radiation (above background).

Air Sampling

Asbestos air sampling will be performed prior to excavation and periodically during excavation activities. The health and safety action level, based on the Occupational Safety and Health Administration (OSHA) permissible exposure level (PEL) is 0.1 fibers/cc of air as an 8-hour TWA or 1.0 f/cc as a 30-minute short-term excursion limit (STEL).

Air samples collected for lead will be compared to the OSHA PEL (TWA) of 0.05 mg/m³.

II. Data Acquisition and Measurement Objectives

9. Site Diagram and Sampling Areas

The site diagram is included in Figure 3.

Air Monitoring

Six fixed air monitoring locations are positioned throughout the landfill, stockpile, and command post areas on site (Figure 3). Each station is outfitted with a DataRAM for PM10 particulate monitoring and an AreaRAE with sensors to monitor VOCs, hydrogen sulfide, carbon monoxide, percent oxygen, the LEL with respect to methane, and radiation.

Mobile air monitors are also located on heavy equipment in the landfill and stockpile areas. Mobile air monitoring stations are outfitted with a MultiRAE Pro positioned inside the cab of the equipment. This instrumentation will be capable of monitoring VOCs, hydrogen sulfide, carbon monoxide, percent oxygen, LEL with respect to methane, and radiation.

All DataRAMs at each fixed air monitoring station and MultiRAE Pros at mobile air monitoring stations will be linked with VIPER. This system will enable data to be logged into the EPA ERT VIPER.net cloud network and will be visible to those with access to the Gorst Creek VIPER.net page. For each instrument connected, real-time data and the connection status will be updated every minute. START will establish alarm limits for instrumentation based on site action levels (Attachment A), and ERT will send alarm emails when data meets or exceeds these action levels. START will obtain weekly data reports from ERT to have easily accessible on site for reference. Additional information can be found in the Viper Data Processing table in the Site Specific Data Management Plan (SSDMP).

AreaRAEs stationed at each fixed air monitoring station will be connected to the Pro RAE Guardian System for real-time data transmission. This system will be integrated with the EPA ERT VIPER system to streamline data inputs into one system. Once integrated, AreaRAE data will function on the VIPER platform generating alarm limits and weekly data reports with all other VIPER-enabled instrumentation.

Air Sampling

Air sample locations are selected based on position of heavy machinery performing landfill excavation activities. Air sampling is performed for analysis of asbestos in air, Phase Contrast Microscopy (PCM)

NIOSH 7400.

After waste profiling results indicated the potential for elevated lead in the waste material, air sampling for lead will also be performed. Personal air samples will be collected from site personnel working near waste that is being excavated and loaded into trucks. Samples from stationary air sampling locations near waste handling activities will also be collected for lead.

10. The Decision Rules

Air Monitoring

If air VOC, dust, hydrogen sulfide, carbon monoxide, percent oxygen, LEL with respect to methane, radiation, and/or asbestos concentrations exceed action levels, engineering controls may be utilized and/or personal protection equipment will be adjusted to reduce human exposure to concentrations below the action levels.

Air Sampling

If asbestos or lead concentrations in air samples exceed action levels, dust suppression and other engineering controls will be reviewed and adjusted to reduce airborne fiber and particulate levels. If asbestos and lead concentrations in air are below action levels, PPE may be downgraded pursuant to a negative exposure assessment.

11. Information Needed for the Decision Rule

The following inputs to the decision are necessary to interpret the analytical results:

Contaminant concentrations
Action/screening levels

12. Sampling and Analysis

Air Monitoring

Air monitoring will be performed initially at each excavation location for VOCs and asbestos, continuously during excavation for dust, and prior to and periodically during excavation for sulfides, carbon monoxide, oxygen, LEL, and radiation. These targeted and grab samples will be analyzed using field methods as listed in Table 2 for particulates, volatile organic compounds, hydrogen sulfide, carbon monoxide, percent oxygen, and the LEL limit with respect to methane. As discussed in Section 9, data collected by air monitoring equipment will be integrated and collected with VIPER through VIPER.net.

Air Sampling

As many as 10 targeted composite air samples will be collected daily (unless rain prevents deploying the instruments) from fixed air monitoring stations and mobile locations (i.e., personnel) around the site to be analyzed for asbestos. Air samples will be grab samples collected on a filter cassette (0.8 micrometer [μm] mixed-cellulose ester [MCE] filter) designed for asbestos sampling and analysis.

Samples at fixed locations will be collected using a Gast air sampling pump at a flow rate of approximately 10 liters per minute (Lpm). Personal samples will be collected from site personnel (e.g., equipment operators and laborers) using SKC personal pumps at a flow rate of approximately 3 Lpm. Personal samples will be collected as 8-hour TWA and as 30-min STEL samples. One blank air filter cassette will also be included with each batch of samples submitted to the laboratory.

All air samples will be analyzed for asbestos and other fibers by phase contrast microscopy (PCM) using NIOSH Method 7400. A subset of these samples may also be analyzed by transmission electron microscopy (TEM) using NIOSH Method 7402 to determine how much of the PCM results represent asbestos fibers. The off-site laboratory for asbestos analyses is EMSL Analytical, Inc., Seattle, Washington.

Air samples for metals will be collected and analyzed using NIOSH Method 7300 as TWA samples. Both fixed and personal samples will be collected using the SKC personal pumps and 0.8 µm MCE filter cassettes designed for metals sampling, with flow rates of approximately 2 to 2.5 Lpm and target sample volumes between 50 and 2,000 liters per NIOSH 7300.

13. Applicability of Data (place an X in front of the data categories needed, explain with comments)

X **A) Definitive data** is analytical data of sufficient quality for final decision-making. To produce definitive data on-site or off-site, the field or lab analysis will have passed full Quality Control (QC) requirements (continuing calibration checks, Method Detection Limit (MDL) study, field duplicate samples, field blank, matrix spikes, lab duplicate samples, and other method-specific QC such as surrogates) AND the analyst will have passed a Precision and Recovery (PAR) study AND the instrument will have a valid Performance Evaluation sample on file. This category of data is suitable for: **1) enforcement purposes, 2) determination of extent of contamination, 3) disposal, 4) RP verification or 5) cleanup confirmation.**
Comments: All chemical analyses at the off-site laboratory will produce definitive data.

 B) Screening data with definitive confirmation is analytical data that may be used to support preliminary or intermediate decision-making until confirmed by definitive data. However, even after confirmation, this data is often not as precise as definitive data. To produce this category of data, the analyst will have passed a PAR study to determine analytical error AND 10% of the samples are split and analyzed by a method that produced definitive data with a minimum of three samples above the action level and three samples below it.

Comments:

X **C) Screening data** is analytical data which has not been confirmed by definitive data. The QC requirements are limited to an MDL study and continuing calibration checks. This data can be used for making decisions: **1) in emergencies, 2) for health and safety screening, 3) to supplement other analytical data, 4) to determine where to collect samples, 5) for waste profiling, and 6) for preliminary identification of pollutants.** This data is not of sufficient quality for final decision-making. Comments: Particulate and VOC air monitoring using field instruments and field hazard categorization testing will produce screening data.

14. Special Sampling or Analysis Directions

Quick turnaround results from the asbestos laboratory will be required during the removal action to allow for adjustments to personal protective equipment and dust control methods if necessary.

Asbestos and lead sampling and VOC air monitoring will occur in the breathing zone during excavation activities at various locations around the excavation to be determined based on daily excavation locations.

Dust monitoring will occur at an estimated two or three excavation perimeter locations to be determined based on daily excavation locations and meteorological conditions.

15. Method Requirements

[Describe the restrictions to be considered in choosing an analytical method due to the need to meet specific regulations, policies, ARARs, and other analytical needs. Examples: 1) Methods must meet USEPA Drinking Water Program requirements. 2) Methods must achieve lower quantitation limits of less than 1/10 the action levels. 3) Methods must be performed exactly as written without modification by the analytical laboratory.]

Methods must achieve lower quantitation limits of at least the action levels.

16. Sample Collection Information

The applicable sample collection Standard Operating Procedures (SOPs) or methods will be followed and include:

Field Activity Logbook SOP
Sample Packaging and Shipping SOP
Sampling Equipment Decontamination SOP
Site entry
Instrument Quick Start Guides: PID/FID Quick Start Guide
DataRAM 4 Quick Start Guide
Multi RAE Pro Quick Start Guide
Area RAE Quick Start Guide

17. Optimization of Sampling Plan (Maximizing Data Quality While Minimizing Time and Cost)

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The format for sample number identification is summarized in Table 1. Sample collection and analysis information is summarized in Table 2.

**Table 1
SAMPLE CODING**

Project Name: Gorst Creek Removal: Air Monitoring and Excavation Waste Profiling **Site ID:** 10GL

SAMPLE NUMBER ⁽¹⁾		
Digits	Description	Code (Example)
1,2,3,4	Year and Month Code	1605 (YYMM)
5,6,7,8	Consecutive Sample Number (grouped by SA as appropriate)	0001 (First sample of SA)

SAMPLE NAME / LOCATION ID ⁽²⁾ (Optional)		
1,2	Sampling Area	AS – Air Monitoring Station LD – Laydown Area LF – Landfill PR – Perimeter PS – Personal Sample SP – Stockpile
3,4	Consecutive Sample Number	01 – First sample of Sampling Area
5,6	Matrix Code	AR – Air QC – Quality Control
7,8	Depth (Optional)	01 (feet below ground surface)

Notes:

(1) The Sample Number is a unique, 8-digit number assigned to each sample.

(2) The Sample Name or Location ID is an optional identifier that can be used to further describe each sample or sample location.

Table 2. Sampling and Analysis

Data Quality	Sampling Area	Matrix	Sampling Pattern	Sample Type	Data Quality	Number of Field Samples	Analyte or Parameter	EPA Method Number	Action Level	Method Quant. Limit	#/type of Sample Containers per Sample	Preservative (Ice to ≤6oC)	Hold Time (days unless otherwise noted) (to extraction/to analysis)	Field QC
Lab Analysis	Landfill area and Personal Monitors	Air	Targeted	Composite	Definitive	Up to 10 daily during excavation	Asbestos	PCM NIOSH 7400 TEM NIOSH 7400 (subset, only if needed)	0.1 fibers/cc	100 fibers/mm ²	0.8-µm cellulose ester	NA	NA	NA
Lab Analysis	Landfill area and Personal Monitors	Air	Targeted	Composite	Definitive	Up to 4 daily during excavation	Lead	NIOSH 7300	0.05 mg/m ³	0.062 µg/filter	0.8-µm cellulose ester	NA	NA	NA
Field Screening	All decision areas	Air	Targeted	Grab	Screening	Initially at each location	VOCs	Instrument Quick Start Guide	1 part per million	0.05 parts per million	NA	NA	NA	None
				Composite		Continuously during excavation	Asbestos	NIOSH 7400	0.1 fibers/cc	100 fibers/mm ²	0.45-µm cellulose ester	NA	NA	NA
							Dust	Instrument Quick Start Guide	1 mg/m ³	0.1 µg/m ³	NA	NA	NA	NA
							H ₂ S		20 ppm (PEL)	0.5 ppm	NA	NA	NA	NA
							CO		50 ppm (PEL)	1 ppm	NA	NA	NA	NA
							O ₂		<19.5% to >23%	0.1%	NA	NA	NA	NA
							LEL		>10%	1%	NA	NA	NA	NA
							Radiation		Above background	0.2 mR/h	NA	NA	NA	NA

Note: For matrix spike and/or duplicate samples, no extra volume is required for air (unless co-located samples are collected), oil, product, or soil samples except soil VOC or NWTPH-Gx samples (triple volume). Triple volume is also required for organic water samples (double volume for inorganic).

Table 3. Common Sample Handling Information

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
Metals	Metals Not including Mercury or Hexachrome. Includes TAL, PP, RCRA lists)	Solid	EPA 6000 / 7000 Series	Glass Jar	200 g	n/a	None	6 months	SW-846 ch. 3
		Aqueous	EPA 6000 / 7000 Series	PTFE or HDPE	600 mL	HNO ₃ to pH < 2	Not listed	6 months	SW-846 ch. 3
	Mercury	Solid	EPA 7471B	Glass Jar	200 g	n/a	≤ 6° C	28 days	SW-846 ch. 3
		Aqueous	EPA 7470A	PTFE or HDPE	400 mL	HNO ₃ to pH < 2	Not listed	28 days	SW-846 ch. 3
	Hexavalent Chromium, (Hexachrome, Cr+6)	Solid	Lab-specific soil extraction modification, EPA 7196A	Glass Jar	100 g	n/a	≤ 6° C	28 days to extraction	SW-846 ch. 3
		Aqueous	EPA 218.6 (Drinking Water)	PTFE or HDPE	400 mL	n/a	≤ 6° C	24 hours	SW-846 ch. 3
	XRF	Solid (in situ; on the ground surface)	6200	none	n/a	none	none	Analyze Immediately	n/a
		Solid (ex situ)	6200	plastic bag	200 g	none	none	6 months	n/a
VOCs	VOCs / BTEX	Solid	EPA 5035 / 8260B	*	*	*	*	2 days to lab / 14 days	SW-846 ch. 4
		Aqueous	EPA 8260B	Amber Vial with Septa Lid	2 x 40 mL	HCl to pH < 2	≤ 6° C (headspace free)	14 days	SW-846 ch. 4
SVOCs	SVOCs / PAHs	Solid	EPA 8270D	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8270D	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
PCBs and Dioxins/Furans	PCBs	Solid	EPA 8082	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8082	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
	Dioxins/Furans	Solid	EPA 8280 or 8290	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8280 or 8290	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
Pesticides and Herbicides	Chlorinated Pesticides	Solid	EPA 8081	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8081	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
	Chlorinated Herbicides	Solid	EPA 8151	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8151	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
NWTPH	Gasoline-Range Organics	Solid	TPHs/NWTPH-Gx	Amber Glass Jar with Septa Lid	4 ounces	n/a	≤ 6° C (headspace free)	14 days	Method
		Aqueous	TPHs/NWTPH-Gx	Amber Vial with Septa Lid	2 x 40 mL	pH < 2 with HCl	≤ 6° C (headspace free)	7 days unpreserved 14 days preserved	Method
	Diesel-Range Organics	Solid	3510, 3540/3550, 8000	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	Method
		Aqueous	3510, 3540/3550, 8000	Glass Amber	2 x 1 L	pH < 2 with HCl	≤ 6° C	7 days unpreserved 14 days preserved	Method

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
Miscellaneous	pH	Solid	EPA 9045	Glass Jar	8 ounces	n/a	n/a	Analyze Immediately	SW-846 ch. 3
		Aqueous	EPA 9040	PTFE	25 mL	n/a	n/a	Analyze Immediately	SW-846 ch. 3
	Total Organic Carbon (TOC)	Solid	SW-846 9060	Glass Jar	100 mL	n/a	≤ 6° C	28 days	SW-846
		Aqueous	EPA 415.1	PTFE or HDPE	200 mL	store in dark HCL or H ₂ SO ₄ to pH <2	≤ 6° C	7 days unpreserved 28 days preserved	Method
	Cyanide	Solid	SW-846 9013	Glass Jar	5 g	n/a	≤ 6° C	14 days	SW-846 ch. 3
		Aqueous	SW-846 9010C	PTFE or HDPE	500 mL	NaOH to pH > 12	≤ 6° C	14 days	SW-846 ch. 3
	Conductivity	Aqueous	EPA 120.1	PTFE or HDPE	100 mL	n/a	n/a	Analyze Immediately	Method
	Hardness	Aqueous	EPA 130.1	PTFE or HDPE	1 x 1 L	HNO ₃ to pH<2	≤ 6° C	28 days	Method
	Total Suspended Solids	Aqueous	EPA 160.2	PTFE or HDPE	100 mL	n/a	≤ 6° C	7 days	Method
	Total Dissolved Solids	Aqueous	EPA 160.1	PTFE or HDPE	100 mL	n/a	≤ 6° C	7 days	Method
	Nitrate/nitrite	Aqueous	EPA 353.2	PTFE or HDPE	1 x 250 mL	H ₂ SO ₄ to pH <2	≤ 6° C	28 days	Method
	Nitrate	Aqueous	SW-846 9210A	PTFE or HDPE	1,000 mL	n/a	≤ 6° C	28 days	SW-846 ch. 3
	Nitrite	Aqueous	SW-846 9216	PTFE or HDPE	25 mL	n/a	≤ 6° C	48 hours	SW-846 ch. 3, Method
	Fluoride	Aqueous	SW-846 9214	PTFE or HDPE	300 mL	n/a	≤ 6° C	28 days	SW-846 ch. 3
	Chloride	Aqueous	SW-846 9250	PTFE or HDPE	50 mL	n/a	≤ 6° C	28 days	SW-846 ch. 3
	Sulfate	Aqueous	SW-846 9035	PTFE or HDPE	50 mL	n/a	≤ 6° C	28 days	SW-846 ch. 3
	Sulfide	Solid	SW-846 9215	Glass Jar	1 x 4 ounces	Fill sample surface with 2N zinc acetate until moistened.	≤ 6° C (headspace free)	7 days	SW-846 ch. 3
		Aqueous	SW-846 9031	PTFE or HDPE	100 mL	4 drops 2N zinc acetate/100 mL sample; NaOH to pH>9.	≤ 6° C (headspace free)	7 days	SW-846 ch. 3

Key:

* = See individual methods. We typically collect 3xEnCore-type samplers and 1x40 mL VOA vial per sample, keep at ≤ 6° C with no chemical preservative, and they must be at the lab within 48 hours of collection.					
C	= Celsius	HNO ₃	= nitric acid	SVOCs	= semivolatile organic compounds
Cr	= chromium	L	= liter	SW-846	= EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
EPA	= Environmental Protection Agency	mL	= milliliter	TAL	= Target Analyte List
g	=grams	n/a	= not applicable	TPH	= total petroleum hydrocarbons
H ₂ SO ₄	= sulfuric acid	NaOH	= sodium hydroxide	VOA	= Volatile Organic Analysis
HCL	= hydrochloric acid	PCBs	= polychlorinated biphenyls	VOCs	= Volatile Organic Compounds
HDPE	= high-density polyethylene	PTFE	= polytetrafluoroethylene		
Hg	= mercury	RCRA	= Resource Conservation and Recovery Act		

III. Assessment and Response

A Sample Plan Alteration Form (SPAF) will be used to describe project discrepancies (if any) that occur between planned project activities listed in the final SSSP and actual project work. The completed SPAF will be approved by the OSC and QAC and appended to the original SSSP.

A Field Sampling Form (FSF) may be used to capture the sampling and analysis scheme for emergency responses in the field and then the FSF pages can be inserted into the appropriate areas of the final SSSP.

Corrective actions will be assessed by the sampling team and others involved in the sampling and a corrective action report describing the problem, solution, and recommendations will be forwarded to the OSC and the ERU QAC.

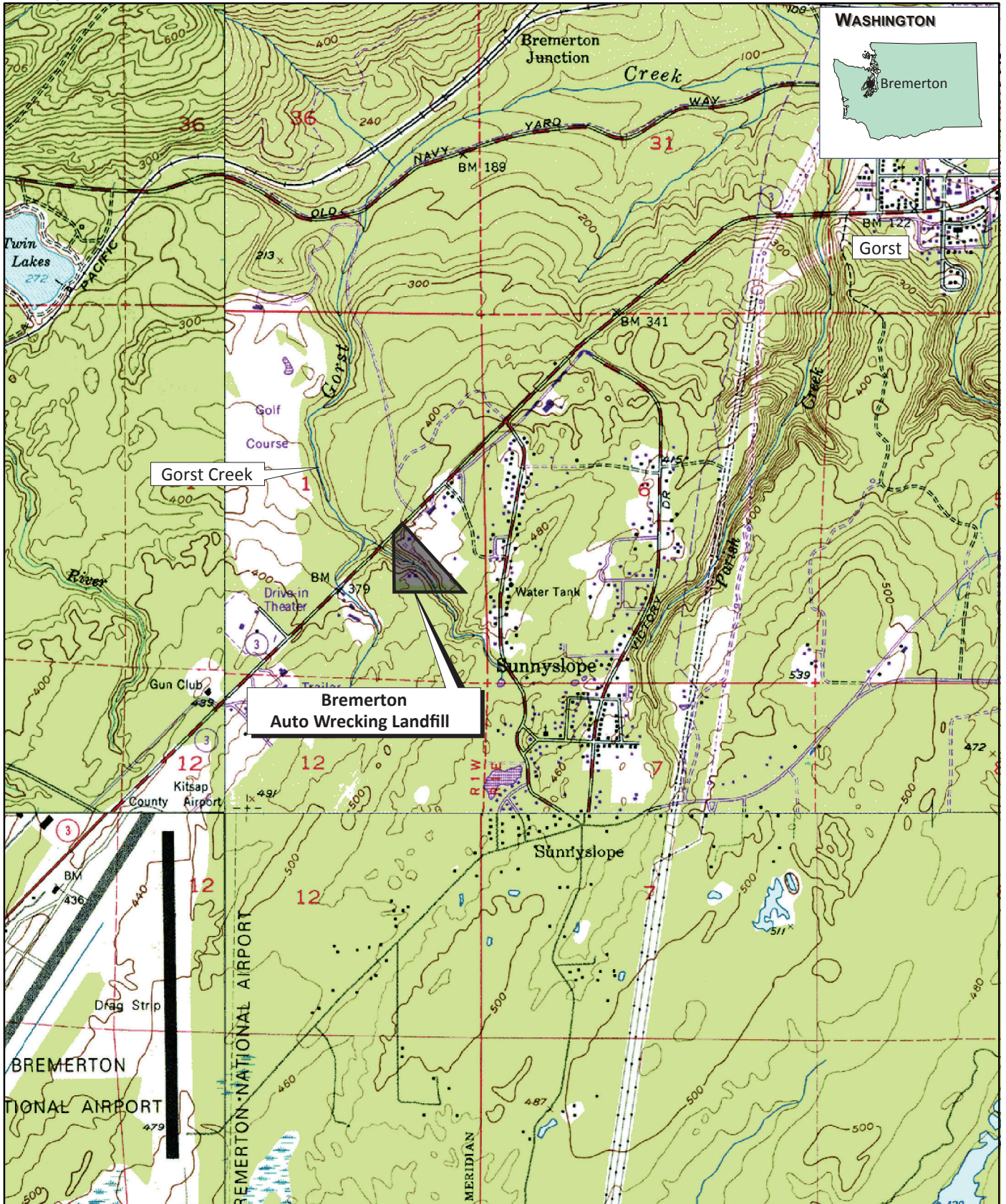
IV. Data Validation and Usability

The sample collection data will be entered into Scribe and Scribe will be used to print lab Chains of Custody. Results of field and lab analyses will be entered into Scribe as they are received and uploaded to Scibe.net when the sampling and analysis has been completed.

18. Data Validation or Verification will be performed by:

ERU's general recommendation on validation is that a minimum of CLP-equivalent stage IIA verification and validation be performed for every SSSP involving laboratory analyses. However, stage IIB is preferred if the lab can provide it. Dioxins should be validated at CLP-equivalent stage 4.

	Data Verification and Validation Stages						
Performed by:	I	IIA	IIB	III	IV	Verification	Other:
E and E QA Reviewer			100%		10%	100% Field Screening	
EPA Region 10 QA Office							
MEL staff							
Other:							



Source: Maptech, Inc. 2001.



0 500 1,000 2,000 3,000 Feet

Gorst Creek Removal Action Port Orchard, Washington

**Figure 1
Site Location Map**

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- Outfall location
- 24-inch corrugated metal pipe under the landfill
- Gorst Creek - Bremerton Auto Wrecking landfill boundary

Gorst Creek Removal Action

Port Orchard, Washington

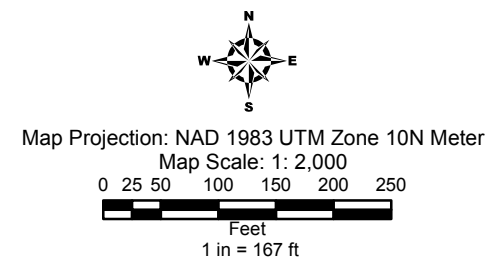


Figure 2
Site Layout

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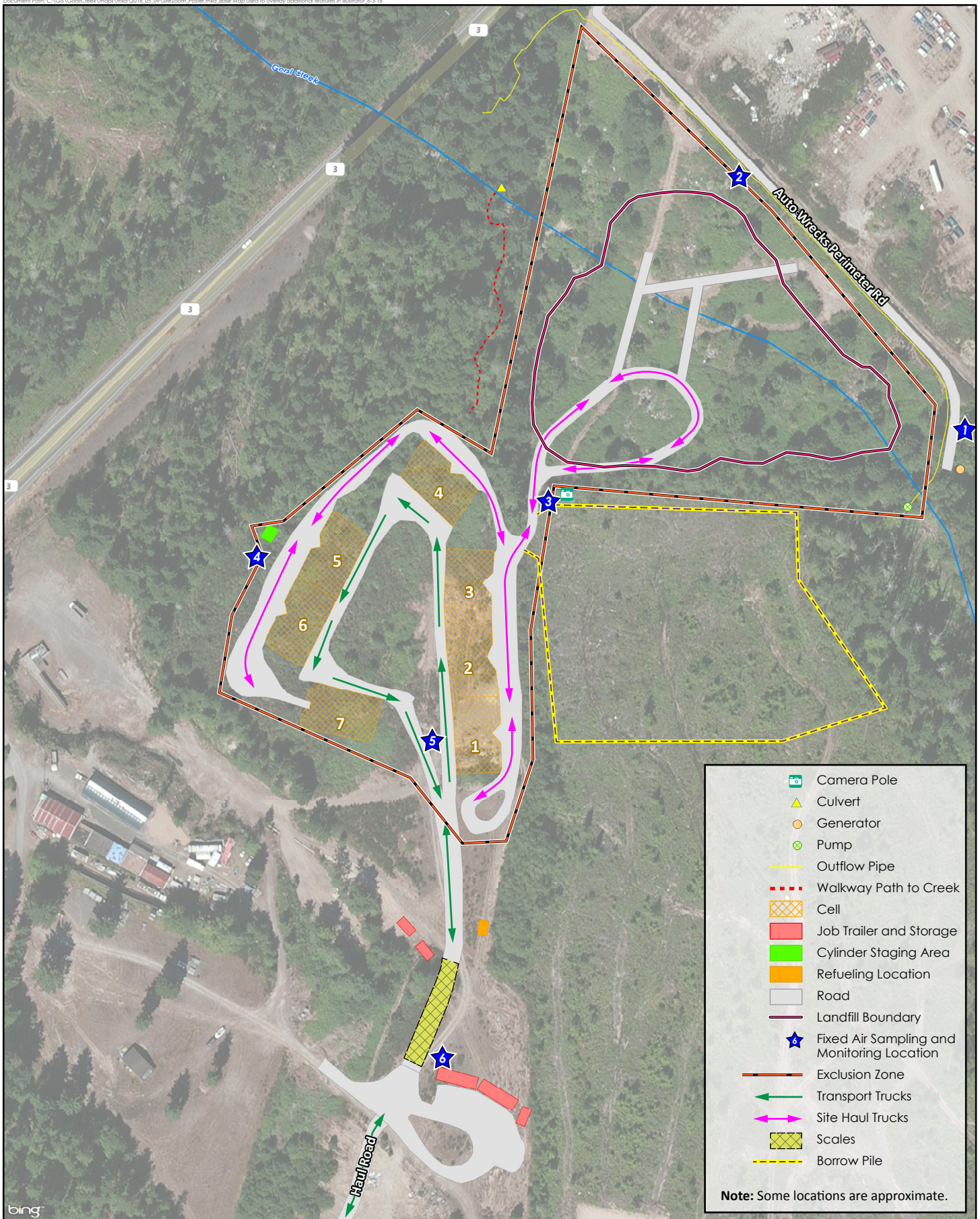


Figure 3
Fixed Air Sampling and Monitoring Locations
Gorst Creek Removal Action

Gorst Creek, WA

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Attachment A
Air Monitoring Action Levels

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Bremerton Auto Wrecking Landfill/Gorst Creek Removal Action						
Health and Safety Action Levels						
Contaminant or Hazard	Level of Personal Protection (PROTECTIVE AT LEVELS SHOWN IN TABLE)				PID (10.6ev)	Protective Action/Measures ¹
	D	C	B	A		
Oxygen	Between 19.5 and 23.5%	Between 19.5 and 23.5%	Less than 23.5%	(see Note 3)	NA	Up-grade after re-evaluation. Attempt to determine what is causing the change in oxygen levels. Remember, a change in the oxygen level may be an indication of other environmental changes that are not being detected.
LEL	Less than 10% of LEL	Less than 10% of LEL	Less than 10% of LEL	(see Note 3)	NA	Evacuate if above 10%. Eliminate the source of the flammable atmosphere and control any source of ignition.
Carbon Monoxide	Less than 35 ppm (REL)	Less than 350 ppm (MUC)	Less than 1,200 ppm (IDLH)	(see Note 3)	ND	Upgrade after re-evaluation. Eliminate the source or cause of the CO. Determine if there are any other environmental changes occurring that are not being detected.
Hydrogen Sulfide	Less than 10 ppm (ceiling)	Less than 100 ppm (MUC)	Less than 100 ppm (IDLH)	(see Note 3)	10.46	Upgrade after re-evaluation. Eliminate the source and control any source of ignition. Determine if there are any other environmental changes occurring that are not being detected.
PID Monitor (10.6ev) VOC (Unknown) without UltraRae	≤Background	Less than 5.1 ppm (or 5,100 ppb)	Less than 500 ppm (or 500,000 ppb)	(see Note 3)		These values are for general guidance. Investigate to identify the contaminant ASAP.
PID Monitor (10.6ev) VOC (Unknown) in conjunction with the UltraRAE for Benzene.	Less than 5 ppm (or 5000 ppb)		Less than 500 ppm (or 500,000 ppb)	(see Note 3)		These values are for general guidance. The SSO should evaluate the total work environment and potential historical sources for the site. Investigate to identify any other contaminant besides benzene ASAP.
Benzene (in conjunction with the 10.6 ev PID Monitor)	Less than 0.1 ppm (or 100 ppb)		Less than 500 ppm (or 500,000 ppb)	(see Note 3)	9.24	Require use of the UltraRae setup for benzene monitoring.
Particulates (nuisance dust)	Less than 3 mg/m3 TWA (ACGIH)	Less than 15 mg/m3			NA	Initiate dust suppression or increase the frequency of application. Particulate concentration may be correlated to other potential contamination such as arsenic, asbestos, lead, and other metals and should be evaluated.
Radiation ²	Less than 1 mR/hr	Less than 1 mR/hr			NA	EPA Guidance. If Greater than background should consult with health physicist. If Greater than 1mR/hr initially withdraw and consult with health physicist about continuous monitor.
Note 1: Personnel may elect to don escape SCBA during an emergency release when they are in Level D PPE and there is an unexpected release. Before u p-grading to higher level of PPE, first evaluate whether engineering or administrative controls to reduce concentration. Always re-evaluate for other potential chemical and physical hazards. Attempt to eliminate contaminate with ventilation.						
Note 2: The low alarm for personal dosimeters is 100 uR/hr. This initial action level is not associated with a change in PPE. However, readings above 100 uR/hr will result in a radiation survey in the general area where the alarm is triggered. A radiation safety officer (RSO) will be notified if this alarm is triggered. Unless airborne contamination is identified during the survey, no upgrade of PPE will be required unless recommended by the RSO.						
Note 3: If concentrations exceed Level B limits, project team will re-evaluate opportunity for increased ventilation and other engineering or administrative controls to eliminate high contaminate concentrations before upgrading to Level A PPE.						

Bremerton Auto Wrecking Landfill/Gorst Creek Removal Action						
Health and Safety Action Levels						
Contaminant or Hazard	Level of Personal Protection (PROTECTIVE AT LEVELS SHOWN IN TABLE)				PID (10.6ev)	Protective Action/Measures ¹
	D	C	B	A		
Lead	Less than 0.05 mg/m ³	Less than 0.5 mg/m ³	Less than 100 mg/m ³	(see Note 3)	NA	These data would be from off-site lab analysis. The correlation with dust concentration may need to be evaluated for real-time monitoring. Initiate dust suppression or increase the frequency of application.
PCBs	Less than 0.001 mg/m ³		Less than 5 mg/m3	(see Note 3)	NA	
DDT	Less than 0.5 mg/m3		Less than 500 mg/m3 (IDLH)	(see Note 3)	NA	
Asbestos	Less than 0.1 f/cc	Greater than 0.1 f/cc	Greater than 0.1 f/cc	(see Note 3)	ND	These data would be from off-site lab analysis. The correlation with dust concentration may need to be evaluated for real-time monitoring. Initiate dust suppression or increase the frequency of application.
Coal Tar Pitch VOCs	Less than 0.2 mg/m3 (PEL)		Less than 80 mg/m3 (IDLH)	(see Note 3)	ND	These data may be from off-site lab analysis. It may be appropriate to determine some other associated representative chemical to monitor this contaminate.
Unusual or Strong Odor					NA	Immediately withdraw, possibly using an emergency escape SCBA to a safe assembly area and re-evaluate what actions need to be taken to either eliminate it at the source or initiate the proper identification and characterization of the odor. Evaluate potential off-site receptor exposure.
Irritation to Eyes					NA	Immediately withdraw, possibly using an emergency escape SCBA to a safe assembly area and re-evaluate what actions need to be taken to either eliminate it at the source or initiate the proper identification and characterization of the irritation. Evaluate potential off-site receptor exposure.
Irritation to Respiratory					NA	Immediately withdraw, possibly using an emergency escape SCBA to a safe assembly area and re-evaluate what actions need to be taken to either eliminate it at the source or initiate the proper identification and characterization of the irritation. Evaluate potential off-site receptor exposure.
Pressure Releasing Noise					NA	Immediately withdraw, possibly using an emergency escape SCBA to a safe assembly area and re-evaluate what actions need to be taken to either eliminate it at the source or initiate the proper response. Evaluate potential off-site receptor exposure.
Visual Fog or Cloud					NA	Immediately withdraw, possibly using an emergency escape SCBA to a safe assembly area and re-evaluate what actions need to be taken to either eliminate it at the source or initiate the proper identification and characterization of the cloud. Evaluate potential off-site receptor exposure.
Wild Animal					NA	Stay clear or back away from the animal and do not block its path. Do not run, but make as much noise as possible. Warn others on site of its presences and direction of travel. If it can be done without any risk to oneself, identify the animal or at least identify markings for later identification.
Poisonous Vegetation	Modified				NA	Mark and isolate the area until the identification has been confirmed. Once confirmed, re-evaluate what proper PPE will be required to work in the area or to remove the vegetation.
Unauthorized Visitor					NA	Direct or escort to the RM or the OSC. Communicate any unusual or threatening actions or conversation directly to the RM or the OSC.
Note 1: Personnel may elect to don escape SCBA during an emergency release when they are in Level D PPE and there is an unexpected release. Before u p-grading to higher level of PPE, first evaluate whether engineering or administrative controls to reduce concentration. Always re-evaluate for other potential chemical and physical hazards. Attempt to eliminate contaminate with ventilation.						
Note 2: The low alarm for personal dosimeters is 100 uR/hr. This initial action level is not associated with a change in PPE. However, readings above 100 uR/hr will result in a radiation survey in the general area where the alarm is triggered. A radiation safety officer (RSO) will be notified if this alarm is triggered. Unless airborne contamination is identified during the survey, no upgrade of PPE will be required unless recommended by the RSO.						
Note 3: If concentrations exceed Level B limits, project team will re-evaluate opportunity for increased ventilation and other engineering or administrative controls to eliminate high contaminate concentrations before upgrading to Level A PPE.						