



Soil Sampling Report

**Lovitt Mine
Facility ID # 59213493
2493 South Methow Street
Wenatchee, Washington**

Prepared For:

**Washington State Department of Ecology
Central Region Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902**

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Project Number: 51109

Prepared By:

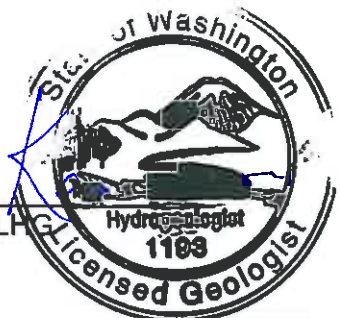
Kane Environmental, Inc.
3815 Woodland Park Ave. N., Suite 102
Seattle, WA 98103

A blue ink signature of Luke Martinkosky, written in a cursive style.

Luke Martinkosky
Environmental Scientist

A blue ink signature of John R. Kane, written in a cursive style.

John R. Kane, L.H.G.
Principal



JOHN R. KANE

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1.0 INTRODUCTION

Soil boring and sampling was conducted at 2493 South Methow Street in Wenatchee, Washington (the Property, Figure 1, *Vicinity Map*). The purpose of this report is to describe the findings of the soil sampling investigation at the Property. Groundwater sampling was not included in the scope of work for the Property.

Historic site information indicates the contaminants likely to be encountered during the soil sampling activities may include, but may not be limited to gasoline- and diesel-range petroleum hydrocarbons, benzene, toluene, ethylbenzene, and toluene (BTEX), chlorinated solvents (such as tetrachloroethylene), antimony, arsenic, barium, beryllium, cadmium, chromium, copper, mercury, nickel, selenium, silver, thallium, zinc and lead in soil. These chemicals are considered to be the contaminants of concern (COCs) at the property.

2.0 BACKGROUND

2.1 Subject Site

The Lovitt Mine property (the Property) is located at 2493 South Methow Street in Wenatchee, Washington. The Property is located in a primarily undeveloped area and was formerly occupied by the Lovitt Mine Office. The Property is currently occupied by the office for Bremmer Construction. A reported heating oil underground storage tank (UST) was removed from the Property in February 1992. Petroleum contamination was observed in the soils beneath the UST and the excavation was extended to 9 feet below ground surface (bgs). Soil samples were collected from the base of the excavation and reported concentrations of TPH as diesel exceeding Ecology "action limits". In June 1992, three soil borings were drilled in the vicinity of the former UST. One boring reported concentrations of TPH as diesel exceeding MTCA Method A Cleanup Levels for Soil at depths from 12.5 feet bgs to 25 feet bgs. No groundwater was encountered in the borings, to a depth of 25 feet bgs. The depth to groundwater at the Property is not known. Soil contamination is believed to be adjacent to and beneath the building. Fill material on the Property reportedly consists of spent mine tailings. No additional historical information was available for review for the subject site. No persons familiar with the Property were available to be interviewed.

2.2 Geologic Setting

Wenatchee is located at the edge of the Northern Cascades and Columbia Basin physiographic provinces. The Northern Cascades physiographic province is characterized by Mesozoic crystalline and metamorphic rocks. The current appearance of the province has been shaped by glacial movement over the past 15,000 years. The Columbia basin was repeatedly scoured (as many as 40 times) by large outbursts of water from glacial lakes in Montana during the Pleistocene (Ice Age). The primary geological formations in the area are Columbia River Basalts and non-glacial sediments. Soils encountered during

the soil sampling activities at the Property consisted of fine to coarse grained sands, clayey sands, and sandy clays with cobbles and gravels. Soil boring logs are included as Attachment C.

2.3 Hydrogeologic Setting

The U.S. Geological Survey (USGS) Wenatchee, Washington 7.5-Minute Quadrangle Topographic Maps (Figure 1), indicates that the ground surface of the Property is approximately 1,125 feet above mean sea level (amsl) and slopes to the southeast, towards Squilchuck Creek. Groundwater flow is expected to be similar to topography and flow the southeast. Groundwater was not encountered in any soil borings.

3.0 METHODOLOGIES

The following sections present the methodologies for: soil boring locations, soil screening, and test boring soil sampling.

3.1 Soil Boring Locations

Four soil borings were advanced at the Property using a Geoprobe drill rig to depths ranging from thirty to thirty-three feet bgs. Drilling depths were determined based on available equipment, the scope of work provided for the Property, and in consultation with the Ecology Site Manager, Mr. Jason Shira. The borings were located in the vicinity off the former UST excavation (see Figure 2). Apparent fill material currently occupies the location of the former UST. Before the commencement of drilling activities, public locate (Utility Notification Center) was contacted to locate underground utilities operated by service subscribers in and around the Property. All drilling locations were cleared by a private utility locator and using available as-built plans. An "air knife" provided by ESN, NW was used to clear the upper five feet of soil prior to starting drilling activity.

3.2 Soil Screening and Sampling

Soil samples from the soil borings were collected in disposable acetate sample liners placed inside the Geoprobe rods. Subsurface soil samples were screened for indications of contamination, including visible free product, hydrocarbon sheen, soil discoloration, and odor. Soil samples were screened with a photoionization detector (PID) to determine the presence or absence of volatile organic vapors. (The PID is a direct-reading, real-time vapor analyzer that can detect most of the volatile hydrocarbon constituents present in the vapor phase of petroleum-affected soils). Petroleum odor or elevated PID readings were present in soil borings SB-1, SB-2, and SB-4. A solvent-type odor was observed in SB-4.

Samples were selected for analysis based on depth to groundwater and field observations. Eleven representative soil samples (not including blind field duplicates) were collected during drilling activities, in laboratory-supplied containers, labeled, and placed in coolers (under chain-of-custody protocol) with ice for temporary storage until received by the analytical laboratory. Six of the soil samples were analyzed.

Soil sample identification began with "CRO" for Central Region Office. The Property was assigned the identification "LM". Soil sampling nomenclature identified each soil sample with an "SB" for samples from the soil boring. Following this designation was a number which corresponded to that particular boring, the last number designated the sample depth. For example, soil sample "CRO-LM-SB-1-26" was the first soil boring and the sample was collected at approximately twenty-six feet below ground surface (bgs).

3.3 Groundwater Sampling

No groundwater samples were collected since it was not included in the scope of work for the Property. Groundwater was not encountered in any of the soil borings.

4.0 LABORATORY ANALYSIS

Soil samples were submitted to ESN, Northwest under chain-of-custody protocol and on a standard turn-around schedule. Samples were analyzed for the COCs in accordance with analytical laboratory protocol and applicable methodology, as follows:

- Hydrocarbon Identification Analysis by NWTPH-HCID
- Diesel and heavy oil-range petroleum hydrocarbons by NWTPH-Dx extended;
- Halogenated Volatile Organic Compounds (HVOCS) by EPA Method 8260; and
- Total Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, mercury, nickel, selenium, silver, thallium, zinc and lead) by EPA Method 6020.

All analyses were performed in accordance with ESN Northwest's in-house Quality Assurance/Quality Control Plans. Sample analyses were performed in compliance with EPA analytical methods and Ecology guidelines. Samples were analyzed within specified holding times. All detection limits were within method requirements and no factors appeared to adversely affect data quality.

5.0 QUALITY CONTROL PROCEDURES

5.1 Field Quality Control

All equipment was calibrated in accordance with the manufacturers' instructions at the start of each day.

5.2 Laboratory QA/QC

Quality Assurance/Quality Control (QA/QC) is of fundamental importance to any chemical testing program. It is the goal to provide analytical data which is scientifically sound and of known and documented quality. To achieve this objective, a quality system was established to ensure that adequate QA/QC procedures are followed and documented, from sample receipt through to the final report. The quality system has been established to meet the requirements of the National Environmental Laboratory Accreditation Program (NELAP). The policies and procedures established are designed to meet quality requirements, as well as those of accrediting authorities.

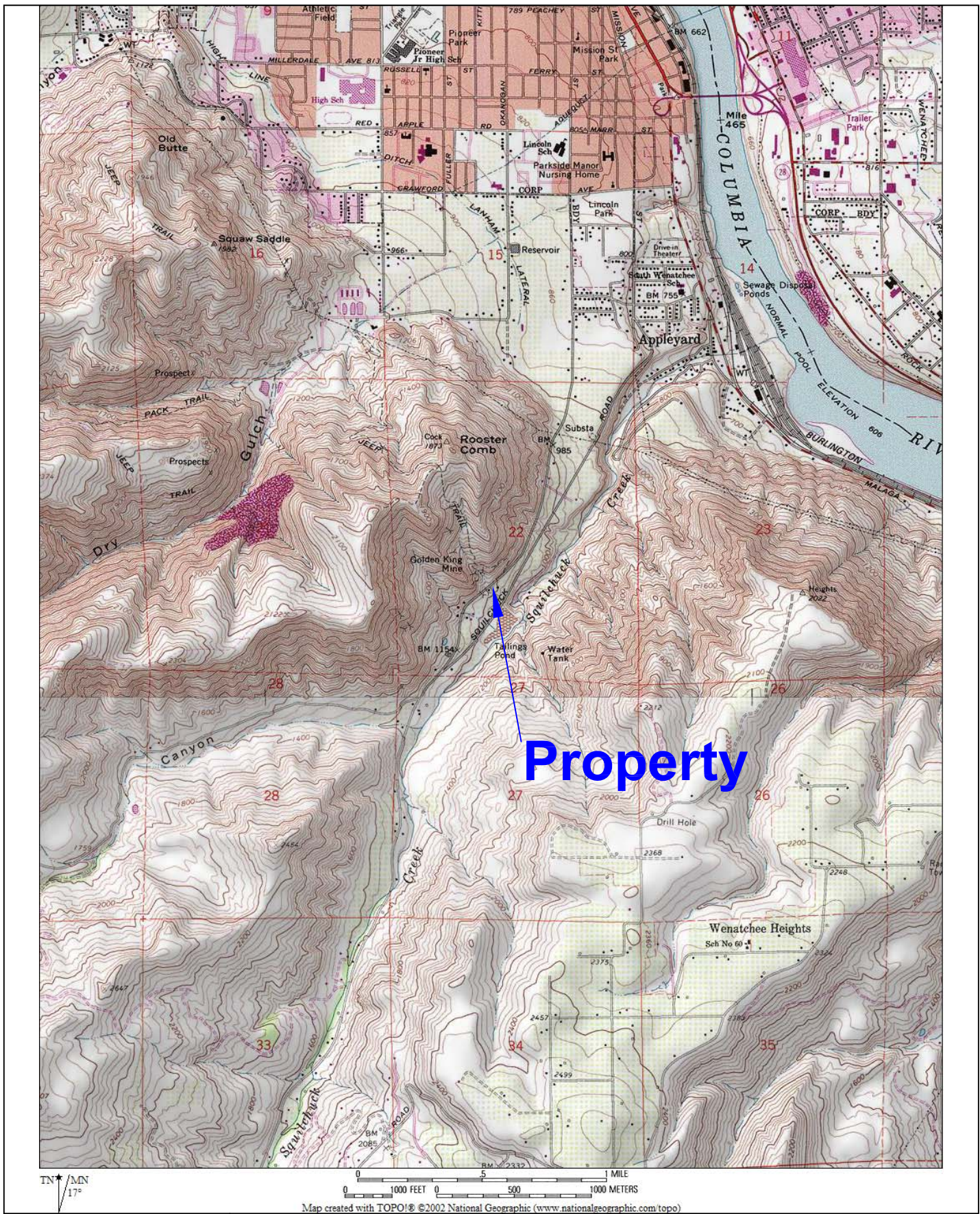
6.0 FINDINGS

All soil samples collected and analyzed from SB-1, SB-2, SB-3, and SB-4 reported concentrations for all metals, except arsenic, listed in Section 5.0 below the MTCA Method A Soil Cleanup Level for Unrestricted Land Use. Concentrations of arsenic exceeding the MTCA Method A Soil Cleanup Level for Unrestricted Land were reported in the following samples: CRO-LM-SB-1-26 (20 milligrams per kilogram (mg/kg)), CRO-LM-SB-3-30 (32 mg/kg), and CRO-LM-SB-4-23 (31 mg/kg). Soil sample CRO-LM-SB-4-23 was the only soil sample analyzed for HVOCs and reported non-detectable concentrations for all HVOCs. Concentrations of gasoline and diesel-range organics were detected by Hydrocarbon Identification Analysis in the following samples: CRO-LM-SB-1-26, CRO-LM-SB-2-30, CRO-LM-SB-4-23, and CRO-LM-SB-4-32. Follow-up analysis of the four soil samples using Method NWTPH-Dx reported the following concentrations of diesel-range organics exceeding the MTCA Method A Soil Cleanup Level for Unrestricted Land Use of 2,000 mg/kg: CRO-LM-SB-1-26 (2,000 mg/kg), CRO-LM-SB-2-30 (5,500 mg/kg), CRO-LM-SB-4-23 (4,400 mg/kg), and CRO-LM-SB-4-32 (3,300 mg/kg). CRO-LM-SB-2-33 reported non-detectable concentrations of diesel-range organics. Soil sample analytical results are summarized in Tables 1 through 4. The laboratory analytical reports are included as Attachment B.

7.0 CONCLUSIONS

Based on the soil analytical results of the Soil Sampling conducted at the Property, soil has impacted with petroleum products from the historic UST. Arsenic impacts exceeding the regional background concentration of 5 mg/kg (as indicated in Ecology Publication 94-115) were also present at the Property. Concentrations of petroleum products were reported at depths ranging from twenty-three (23) to thirty-two (32) feet bgs. In soil boring CRO-LM-SB-2 the lower soil sample, taken at thirty-three (33) feet bgs reported non-detectable concentrations of diesel-range organics and the upper soil sample, taken at thirty (30) feet bgs, reported a diesel-range organics concentration of 5,500 mg/kg. However, diesel-range organics concentration of 3,300 mg/kg was reported at vertical limit of drilling in CRO-LM-SB-4. The full vertical extents of the petroleum impacts at the Property were not found during the soil sampling activity. Depth to groundwater is currently unknown, therefore it is unknown if groundwater contamination from the petroleum products in the soil is present. Additional subsurface investigation is recommended at the Property to determine the vertical extents of the petroleum and arsenic impacts and to determine if groundwater contamination has occurred.

FIGURES



Soil Sampling
 Lovitt Mine
 2493 South Methow Street
 Wenatchee, Washington

Figure 1
 Vicinity Map



LEGEND

SB-3

Approximate Location of Soil Boring with Petroleum Concentrations Below Soil Cleanup Levels

SB-2

Approximate Location of Soil Boring with Petroleum Concentrations Exceeding Soil Cleanup Levels

Soil Boring Coordinates

Soil Boring	Latitude	Longitude
SB-1	47.38111	-120.31525
SB-2	47.38115	-120.31522
SB-3	47.38115	-120.31520
SB-4	47.38113	-120.31520

0 50 100

Approximate Scale in Feet

Aerial Photograph Provided by Google Earth



Soil Sampling
Lovitt Mine
2493 South Methow Street
Wenatchee, Washington

Figure 2
Site Plan

TABLES

TABLE 1
Summary of Total Petroleum Hydrocarbons in Soil by TPH-HCID
Lovitt Mine
Wenatchee, Washington

Sample ID	Sample Depth (in feet)	Sample Date	Gasoline Range Organics mg/kg	Diesel Range Organics mg/kg	Lube Oil Range Organics mg/kg
CRO-LM-SB-1-26	26	8/25/2010	Detected	Detected	nd
CRO-LM-SB-2-30	30	8/25/2010	Detected	Detected	nd
CRO-LM-SB-2-33	33	8/25/2010	nd	nd	nd
CRO-LM-SB-3-30	30	8/25/2010	nd	nd	nd
CRO-LM-SB-4-23	23	8/25/2010	Detected	Detected	nd
CRO-LM-SB-4-32	32	8/25/2010	Detected	Detected	nd
CRO-LM-SB- Blind Dup2*	30	8/25/2010	Detected	Detected	nd
Method Reporting Limit			20	50	100

Notes:

mg/kg = milligrams per kilogram [equivalent to parts per million (ppm)]

– = Not analyzed.

Shaded and Bold concentrations are above MTCA Method A Cleanup Level for Unrestricted Land Use.

nd = not detected at Method Reporting Limit

* = Blind Duplicate of CRO-LM-SB-2-30

TABLE 2
Summary of Petroleum Products in Soil
Lovitt Mine
Wenatchee, Washington

Sample ID	Sample Depth (in feet)	Sample Date	Diesel Range Organics mg/kg	Lube Oil Range Organics mg/kg
CRO-LM-SB-1-26	26	8/25/2010	2,000	nd
CRO-LM-SB-2-30	30	8/25/2010	5,500	nd
CRO-LM-SB-2-33	33	8/25/2010	nd	nd
CRO-LM-SB-3-30	30	8/25/2010	nd	nd
CRO-LM-SB-4-23	23	8/25/2010	4,400	nd
CRO-LM-SB-4-32	32	8/25/2010	3,300	nd
CRO-LM-SB- Blind Dup2*	30	8/25/2010	2,200	nd
CRO-LM-SB- Blind Dup2 Duplicate ¹	30	8/25/2010	2,000	nd
Method Reporting Limit			50	100
MTCA Method A Cleanup Level for Unrestricted Land Use			2000	2000

Notes:

mg/kg = milligrams per kilogram [equivalent to parts per million (ppm)]

– = Not analyzed.

NV = no value for cleanup level

Shaded and Bold concentrations are above MTCA Method A Cleanup Level for Unrestricted Land Use.

a = Cleanup level used if benzene is present or total of ethylbenzene, toluene and xylenes is greater than 1% of gasoline mixture.

nd = not detected at Method Reporting Limit

^ = Total value for naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

* = Blind Duplicate of CRO-LM-SB-2-30

¹ = Laboratory Duplicate of Blind Duplicate collected in field

Table 3
Summary of Halogenated Volatile Organic Compounds in Soil
Lovitt Mine
Wenatchee, Washington

Sample ID	CRO-LM-SB-4-23	Trip Blank	Method Reporting Limit (mg/kg)	MTCA Method A or Method B Cleanup Level (mg/kg)
Sample Depth (in feet)	23	N/A		
Sample Date (2010)	8/25/2010	N/A		
Bromobenzene	nd	nd	0.05	NV
Bromochloromethane	nd	nd	0.05	NV
Bromodichloromethane	nd	nd	0.05	16.1
Bromoform	nd	nd	0.05	127
Bromomethane	nd	nd	0.05	112
Carbon Tetrachloride	nd	nd	0.05	8
Chlorobenzene	nd	nd	0.05	1,600
Chloroethane	nd	nd	0.05	NV
Chloroform	nd	nd	0.05	164
Chloromethane	nd	nd	0.05	77
2-Chlorotoluene	nd	nd	0.05	1,600
4-Chlorotoluene	nd	nd	0.05	1,600
Dibromochloromethane	nd	nd	0.05	12
1,2-Dibromo-3-chloropropane	nd	nd	0.05	1
1,2-Dibromoethane (EDB)	nd	nd	0.01	0.005
Dibromomethane	nd	nd	0.05	NV
1,2-Dichlorobenzene	nd	nd	0.05	7,200
1,3-Dichlorobenzene	nd	nd	0.05	NV
1,4-Dichlorobenzene	nd	nd	0.05	42
Dichlorodifluoromethane	nd	nd	0.05	16,000
1,1-Dichloroethane	nd	nd	0.05	8,000
1,2-Dichloroethane	nd	nd	0.05	11
1,1-Dichloroethene	nd	nd	0.05	2
cis-1,2-Dichloroethene	nd	nd	0.05	800
trans-1,2-Dichloroethene	nd	nd	0.05	1,600
1,2-Dichloropropane	nd	nd	0.05	15
1,3-Dichloropropane	nd	nd	0.05	NV
2,2-Dichloropropane	nd	nd	0.05	NV
1,1-Dichloropropene	nd	nd	0.05	NV
cis-1,3-Dichloropropene	nd	nd	0.05	5.56
trans-1,3-Dichloropropene	nd	nd	0.05	5.56
Hexachloro-1,3-butadiene	nd	nd	0.05	12.8
Methylene Chloride	nd	nd	0.50	0.02
1,1,1,2-Tetrachloroethane	nd	nd	0.05	38
1,1,2,2-Tetrachloroethane	nd	nd	0.05	5
Tetrachloroethylene (PCE)	nd	nd	0.02	0.05
1,2,3-Trichlorobenzene	nd	nd	0.05	NV
1,2,4-Trichlorobenzene	nd	nd	0.05	800
1,1,1-Trichloroethane	nd	nd	0.05	72,000
1,1,2-Trichloroethane	nd	nd	0.05	18
Trichloroethene (TCE)	nd	nd	0.02	0.03
Trichlorofluoromethane	nd	nd	0.05	24,000
1,2,3-Trichloropropane	nd	nd	0.05	0.14
Vinyl Chloride	nd	nd	0.01	0.67

Notes:

All results reported in mg/kg (milligrams per kilogram)

nd = Not detected at method reporting limit.

NV = No cleanup value under this criteria.

Shaded and Bold concentrations are above MTCA Method A Cleanup Level for Unrestricted Land Use.

N/A = Not Applicable

TABLE 4
Summary of Priority Pollutant Metals in Soil
Lovitt Mine
Wenatchee, Washington

Sample ID	Sample Depth (in feet)	Sample Date	Lead mg/kg	Cadmium mg/kg	Chromium (total) mg/kg	Arsenic mg/kg	Silver mg/kg	Barium mg/kg	Selenium mg/kg	Copper mg/kg	Zinc mg/kg	Nickel mg/kg	Thallium mg/kg	Antimony mg/kg	Beryllium mg/kg	Mercury mg/kg
CRO-LM-SB-1-26	26	8/25/2010	5.7	nd	8.6	20	nd	76	nd	nd	20	nd	nd	nd	nd	nd
CRO-LM-SB-1-26 Duplicate*	26	8/25/2010	6.4	nd	9.6	22	nd	83	nd	nd	22	nd	nd	nd	nd	nd
CRO-LM-SB-2-30	30	8/25/2010	5.8	nd	9.7	17	nd	73	nd	nd	22	nd	nd	nd	nd	0.5
CRO-LM-SB-2-33	33	8/25/2010	5.2	nd	11	11	nd	84	nd	nd	28	nd	nd	nd	nd	nd
CRO-LM-SB-3-30	30	8/25/2010	nd	nd	6.6	32	nd	51	nd	nd	nd	nd	nd	nd	nd	0.7
CRO-LM-SB-4-23	23	8/25/2010	nd	nd	6	31	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6
CRO-LM-SB-4-32	32	8/25/2010	nd	nd	9.6	12	nd	60	nd	nd	24	nd	nd	nd	nd	nd
CRO-LM-SB- Blind Dup2*	30	8/25/2010	5.8	nd	9	18	nd	74	nd	nd	nd	nd	nd	nd	nd	0.5
Method Reporting Limit			5	1	5	5	20	50	20	20	20	20	20	20	20	2
MTCA Method A Cleanup Level for Unrestricted Land Use¹			250	2	NV	20	NV	NV	400	2960	24000	1600	5.6	32[^]	160	2

Notes:

mg/kg = milligrams per kilogram [equivalent to parts per million (ppm)]

– = Not analyzed.

Shaded and Bold concentrations are above MTCA Method A Cleanup Level for Unrestricted Land Use.

nd = not detected at Method Reporting Limit

* = Blind Duplicate of CRO-LM-SB-2-30

1 = If MTCA Method A Cleanup Levels were not available, Method B Cleanup Levels are used.

[^] = As Antimony trioxide

NV = No MTCA cleanup value for this compound

* = Laboratory Duplicate

ATTACHMENT A

ABBREVIATIONS AND DEFINITIONS

ABBREVIATIONS AND DEFINITIONS

This section provides definitions of key terms used commonly in discussion of soil sampling. The purpose of this section is to assist the contractor and contractor personnel in the implementation of this plan. The sources of these definitions are for the most part 40 CFR 260, WAC 173-303; this source should be consulted both for the complete definitions of the terms below and for the definitions of other terms not included here.

Abbreviations

ASTM	American Society for Testing and Materials
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COCs	Contaminants of Concern
DNAPL	Dense Non-aqueous Phase Liquid
Ecology	Department of Ecology
DOT	Department of Transportation
Dx	Diesel- and Diesel-range Extended Petroleum Hydrocarbons
EPA	Environmental Protection Agency
FS	Feasibility Study
HASP	Health and Safety Plan
HSA	Hollow Stem Auger
HSWA	Hazardous and Solid Waste Amendments
Gx	Gasoline- and Gasoline-extended Range Petroleum Hydrocarbons
LNAPL	Light Non-aqueous Phase Liquid
mg/kg	Milligrams per kilogram (e.g. parts per million in solid)
mg/L	Milligrams per liter (e.g. parts per million in liquid)

µg/kg	Micrograms per kilogram (e.g. parts per billion in solid)
µg/L	Micrograms per liter (e.g. parts per billion in liquid)
MRL	Method Reporting Limits
MTCA	Model Toxics Control Act
MW	Monitoring Well
LUST	Leaking Underground Storage Tank
PCB	Polychlorinated Biphenyl
PID	Photoionization Device
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SVOC	Semi-volatile Organic Compounds
SWP	Site Work Plan
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSD	Treatment, Storage, and Disposal Facility
TSS	Total Suspended Solids
TOC	Total Organic Carbon
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code

Definitions

Accumulation Area: An area used to collect dangerous waste for less than 90 days.

Calibration: The act of adjusting the range and sensitivity of any direct-reading instrument used for field screening

Contaminated Soil: Soil determined by analytical testing to contain contaminant concentrations in quantities which require special handling and disposal practices by personnel.

Container: A portable device in which a material is stored, transported, treated, disposed of or otherwise handled.

Debris: Combustible and noncombustible wastes such as ashes and waste materials resulting from construction and repair work, leaves, and tree trimmings.

Decontamination: The process of removing contaminants from individuals and equipment.

Decontamination Area: Area delineated where personnel may effectively remove contaminants prior to leaving the exclusion zone.

Direct Reading Instrument: Instrumentation used by the oversight consultant to provide quantitative information regarding the potential concentrations of any given contaminant for field screening purposes.

Discharge or Hazardous Waste Discharge: The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying or dumping of hazardous or dangerous waste into or on land or water.

Exclusion Zone: Any area clearly delineated by flagging or signage as containing suspect soils.

Flammable Liquid: A liquid with a flash point of less than 100°F.

Flammable Solid: Any solid material that is liable to cause fires through friction or retained heat, or which can be readily ignited and when ignited burns vigorously and persistently.

Four-Gas Monitor: A direct reading instrument which is able to detect the concentrations of oxygen, carbon dioxide, hydrogen sulfide, and lower explosion limit of a COC in ambient air. Commonly used in confined-space entry and UST removal.

Hazardous Material: Any material that, due to its quantity, concentration, or physical, chemical, toxic or infectious characteristics, may pose a substantial hazard to human health or the environment if released.

Hazardous Substance: A hazardous material or hazardous waste that is designated as a hazardous substance under Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Hazardous substances that are regulated by the EPA are listed at 40 CFR 302.

Hazardous Waste: A solid waste that meets the definition of a hazardous waste under 40 CFR 261.3. Hazardous materials with an expired shelf life are not considered hazardous waste until designated as a waste.

Head Space: The vapor contained in any container which holds soil or suspect soils.

Hot: Term commonly used to describe soils or groundwater which contain or are considered likely to contain elevated concentrations of contaminants.

Hot Spot: Any area where evidence (as provided by historic, visual, olfactory, direct reading instruments or analytical data) suggests a concentrated location of contaminated soils.

Incompatible Waste: Waste which may cause corrosion or decay of a particular container; or waste which may produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases, or flammable fumes or gases on mixing with another waste or substance under uncontrolled conditions.

Lab Pack: A container used for packaging smaller containers of compatible waste for disposal.

LUST: Leaking underground storage tank, usually used historically to hold petroleum or other regulated materials.

Manifest: The EPA hazardous waste shipping record, consisting of *EPA Form 8700-22*, Uniform Hazardous Waste Manifest, and the *Continuation Sheet 8700-22A*, where needed. Instructions for initiating, completing and retaining the manifest are included in 40 CFR 262, Subpart B, and in the Appendix to 40 CFR 262.

Oily Waste: Petroleum products and bituminous materials.

Overburden: Non-petroleum contaminated soils which need to be removed to gain access to petroleum-contaminated soils

PID: Photoionization Detector; a direct-reading instrument which can quantitatively screen for organic vapor concentrations.

Product: Term commonly used to describe any variety of petroleum products.

Problem Waste: Non-hazardous waste such as oily debris or contaminated soil which can be disposed of only after special requirements are met.

Release: The intentional or accidental loss of a hazardous substance into the environment through spillage, leakage, pumping, pouring, emitting, emptying, discharge, injection, escape, leaching, or disposal.

Screening: The process of using qualitative and quantitative information to determine whether soils are considered suspect.

Spill: Any accidental or un-permitted discharge of a hazardous substance into or upon surrounding lands or waters.

Solid Waste: A waste that meets the definition of a solid waste under 40 CFR 261.2.

Stockpile: Area where confirmed-contaminated soils are stored prior to disposal or treatment.

Storage: The temporary retention of a hazardous or dangerous waste prior to treatment, storage or disposal elsewhere.

Superfund Site: Also known as EPA Superfund Site, as dictated by the Comprehensive Environmental Response, Compensation, and Liability Act.

Suspect Soil: Soil which has been determined by the oversight consultant as likely to contain elevated concentrations of contaminants.

Tank: A stationary device constructed of non-earthen materials and used to contain or accumulate dangerous waste. In general, secondary containment structures meet the definition of a tank.

UST: Underground storage tank; a subsurface holding tank commonly used for petroleum and other regulated materials.

Velocity: Distance traveled per unit of time.

ATTACHMENT B
LABORATORY ANALYTICAL PACKAGE

CLIENT: Kane Env.
ADDRESS: 3831 Stone Way, Seattle
PHONE: 206-691-0476 FAX:
CLIENT PROJECT #: 51109 PROJECT MANAGER: LM

[illegible]

ESN NORTHWEST CHEMISTRY LABORATORY

Department of Ecology
LOVITT MINE PROJECT
Client Project #51109
Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Total Metals in Soil by EPA-6020 Method

Sample Number	Date Analyzed	Lead (Pb) (mg/kg)	Cadmium (Cd) (mg/kg)	Chromium (Cr) (mg/kg)	Arsenic (As) (mg/kg)	Silver (Ag) (mg/kg)	Barium (Ba) (mg/kg)	Selenium (Se) (mg/kg)
Method Blank	9/1/2010	nd	nd	nd	nd	nd	nd	nd
CRO-LM-SB-1-26	9/1/2010	5.7	nd	8.6	20	nd	76	nd
CRO-LM-SB-1-26 Dup.	9/1/2010	6.4	nd	9.6	22	nd	83	nd
CRO-LM-SB-2-30	9/1/2010	5.8	nd	9.7	17	nd	73	nd
CRO-LM-SB-2-33	9/1/2010	5.2	nd	11	11	nd	84	nd
CRO-LM-SB-3-30	9/1/2010	nd	nd	6.6	32	nd	51	nd
CRO-LM-SB-4-23	9/1/2010	nd	nd	6.0	31	nd	nd	nd
CRO-LM-SB-4-32	9/1/2010	nd	nd	9.6	12	nd	60	nd
CRO-LM-SB-Blind Dup 2	9/1/2010	5.8	nd	9.0	18	nd	74	nd
Method Detection Limits		5	1	5	5	20	50	20

"nd" Indicates not detected at listed detection limits.

ESN NORTHWEST CHEMISTRY LABORATORY

Department of Ecology
LOVITT MINE PROJECT
Client Project #51109
Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Total Metals in Soil by EPA-6020 Method

Sample Number	Date Analyzed	Copper (Cu) (mg/kg)	Zinc (Zn) (mg/kg)	Nickel (Ni) (mg/kg)	Thallium (Tl) (mg/kg)	Antimony (Sb) (mg/kg)	Beryllium (Be) (mg/kg)	Mercury (Hg) (mg/kg)
Method Blank	9/1/2010	nd	nd	nd	nd	nd	nd	nd
CRO-LM-SB-1-26	9/1/2010	nd	20	nd	nd	nd	nd	nd
CRO-LM-SB-1-26 Dup.	9/1/2010	nd	22	nd	nd	nd	nd	nd
CRO-LM-SB-2-30	9/1/2010	nd	22	nd	nd	nd	nd	0.5
CRO-LM-SB-2-33	9/1/2010	nd	28	nd	nd	nd	nd	nd
CRO-LM-SB-3-30	9/1/2010	nd	nd	nd	nd	nd	nd	0.7
CRO-LM-SB-4-23	9/1/2010	nd	nd	nd	nd	nd	nd	0.6
CRO-LM-SB-4-32	9/1/2010	nd	24	nd	nd	nd	nd	nd
CRO-LM-SB-Blind Dup 2	9/1/2010	nd	nd	nd	nd	nd	nd	0.5
Method Detection Limits		20	20	20	20	20	20	0.5

"nd" Indicates not detected at listed detection limits.

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Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

QA/QC Data - Total Metals EPA-6020

Sample Number: CRO-SB-LM-4-32							
Matrix Spike			Matrix Spike Duplicate			RPD	
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)		Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
							(%)
Lead	35	45	129M		34	42	122M
Cadmium	35	34	97		34	32	94
Chromium	35	28	80		34	26	76M
Arsenic	35	29	83		34	28	82
Silver	35	46	131M		34	43	126M
Barium	35	34	97		34	28	82
Selenium	35	19	54M		34	18	53M
Copper	35	19	54M		34	18	53M
Zinc	35	38	109		34	36	106
Nickel	35	21	60M		34	20	59M
Thallium	35	42	120		34	40	118
Antimony	35	36	103		34	33	97
Beryllium	35	27	77M		34	26	76M
Mercury	3.5	3.7	106		3.4	3.6	106

Laboratory Control Sample			
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	50	52	104
Cadmium	50	58	116
Chromium	50	58	116
Arsenic	50	50	100
Silver	50	53	106
Barium	50	63	126
Selenium	50	48	96
Copper	50	49	98
Zinc	50	53	106
Nickel	50	53	106
Thallium	50	53	106
Antimony	50	58	116
Beryllium	50	53	106
Mercury	5.0	5.2	104

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 80%-120%

ACCEPTABLE RPD IS 35%

M - Matrix Spike recovery failed due to matrix interference.

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Client Project #51109
Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Hydrocarbon Identification Analysis of Soil by Method NWTPH-HCID

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Gasoline Range Organics (mg/kg)	Diesel Range Organics (mg/kg)	Lube Oil Range Organics (mg/kg)
Method Blank	8/31/2010	8/31/2010	97%	nd	nd	nd
CRO-LM-SB-1-26	8/31/2010	8/31/2010	96%	D	D	nd
CRO-LM-SB-2-30	8/31/2010	8/31/2010	96%	D	D	nd
CRO-LM-SB-2-33	8/31/2010	8/31/2010	95%	nd	nd	nd
CRO-LM-SB-3-30	8/31/2010	8/31/2010	98%	nd	nd	nd
CRO-LM-SB-4-23	8/31/2010	8/31/2010	98%	D	D	nd
CRO-LM-SB-4-32	8/31/2010	8/31/2010	97%	D	D	nd
CRO-LM-SB-Blind Dup2	8/31/2010	8/31/2010	97%	D	D	nd
LCS	8/31/2010	8/31/2010	100%	112%	---	---
LCS Dup	8/31/2010	8/31/2010	99%	119%	---	---
Reporting Limits				20	50	100

"nd" Indicates not detected at listed detection limits.

"D" Indicates detected above the listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 65% TO 135%

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Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Halogenated Volatile Organic Compounds in Soil by Method 8260
Analytical Results

8260B Halogenated, mg/kg		MTH BLK	LCS	LCS Dup	CRO-LM-SB-4-23
Matrix		Soil	Soil	Soil	Soil
Date extracted	Reporting	08/31/10	08/31/10	08/31/10	08/31/10
Date analyzed	Limits	08/31/10	08/31/10	08/31/10	08/31/10
Dichlorodifluoromethane	0.05	nd	72%	97%	nd
Chloromethane	0.05	nd	79%	97%	nd
Vinyl chloride	0.01	nd	68%	71%	nd
Bromomethane	0.05	nd	73%	72%	nd
Chloroethane	0.05	nd	103%	84%	nd
Trichlorofluoromethane	0.05	nd	74%	76%	nd
1,1-Dichloroethene	0.05	nd	66%	88%	nd
Methylene chloride	0.50	nd	100%	99%	nd
trans-1,2-Dichloroethene	0.05	nd	70%	91%	nd
1,1-Dichloroethane	0.05	nd	69%	73%	nd
cis-1,2-Dichloroethene	0.05	nd	89%	69%	nd
2,2-Dichloropropane	0.05	nd	70%	70%	nd
Chloroform	0.05	nd	72%	68%	nd
Bromochloromethane	0.05	nd	88%	91%	nd
1,1,1-Trichloroethane	0.05	nd	66%	88%	nd
1,2-Dichloroethane (EDC)	0.05	nd	73%	67%	nd
1,1-Dichloropropene	0.05	nd	69%	80%	nd
Carbon tetrachloride	0.05	nd	70%	69%	nd
Trichloroethene (TCE)	0.02	nd	74%	72%	nd
1,2-Dichloropropane	0.05	nd	80%	71%	nd
Dibromomethane	0.05	nd	80%	85%	nd
Bromodichloromethane	0.05	nd	83%	70%	nd
cis-1,3-Dichloropropene	0.05	nd	72%	82%	nd
trans-1,3-Dichloropropene	0.05	nd	70%	67%	nd
1,1,2-Trichloroethane	0.05	nd	76%	91%	nd
1,3-Dichloropropane	0.05	nd	76%	70%	nd
Dibromochloromethane	0.05	nd	71%	68%	nd
Tetrachloroethene (PCE)	0.02	nd	70%	66%	nd
1,2-Dibromoethane (EDB)	0.01	nd	78%	68%	nd
Chlorobenzene	0.05	nd	81%	70%	nd
1,1,1,2-Tetrachloroethane	0.05	nd	81%	72%	nd
Bromoform	0.05	nd	73%	76%	nd
1,1,2,2-Tetrachloroethane	0.05	nd	78%	74%	nd
Bromobenzene	0.05	nd	78%	66%	nd
1,2,3-Trichloropropane	0.05	nd	85%	66%	nd
2-Chlorotoluene	0.05	nd	75%	70%	nd
4-Chlorotoluene	0.05	nd	79%	82%	nd
1,3-Dichlorobenzene	0.05	nd	80%	67%	nd
1,4-Dichlorobenzene	0.05	nd	82%	68%	nd
1,2-Dichlorobenzene	0.05	nd	80%	69%	nd
1,2-Dibromo-3-Chloropropane	0.05	nd	83%	77%	nd
1,2,4-Trichlorobenzene	0.05	nd	88%	76%	nd
Hexachloro-1,3-butadiene	0.05	nd	74%	70%	nd
1,2,3-Trichlorobenzene	0.05	nd	83%	79%	nd

Surrogate recoveries:

Dibromofluoromethane	99%	97%	99%	121%
Toluene-d8	99%	102%	101%	97%
4-Bromofluorobenzene	98%	97%	97%	99%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

ESN NORTHWEST CHEMISTRY LABORATORY

Department of Ecology
LOVITT MINE PROJECT
Client Project #51109
Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Halogenated Volatile Organic Compounds in Water by Method 8260

Analytical Results

8260B Halogenated, µg/L	MTH BLK	LCS	Trip Blank
Matrix	Reporting	Water	Water
Date analyzed	Limits	08/27/10	08/27/10
Dichlorodifluoromethane	1.0	nd	nd
Chloromethane	1.0	nd	nd
Vinyl chloride	0.2	nd	nd
Bromomethane	1.0	nd	nd
Chloroethane	1.0	nd	nd
Trichlorofluoromethane	1.0	nd	nd
1,1-Dichloroethene	1.0	72%	nd
Methylene chloride	1.0	nd	nd
trans-1,2-Dichloroethene	1.0	nd	nd
1,1-Dichloroethane	1.0	nd	nd
cis-1,2-Dichloroethene	1.0	nd	nd
2,2-Dichloropropane	1.0	nd	nd
Chloroform	1.0	nd	nd
Bromochloromethane	1.0	nd	nd
1,1,1-Trichloroethane	1.0	nd	nd
1,2-Dichloroethane (EDC)	1.0	nd	nd
1,1-Dichloropropene	1.0	nd	nd
Carbon tetrachloride	1.0	nd	nd
Trichloroethene (TCE)	1.0	108%	nd
1,2-Dichloropropane	1.0	nd	nd
Dibromomethane	1.0	nd	nd
Bromodichloromethane	1.0	nd	nd
cis-1,3-Dichloropropene	1.0	nd	nd
trans-1,3-Dichloropropene	1.0	nd	nd
1,1,2-Trichloroethane	1.0	nd	nd
1,3-Dichloropropane	1.0	nd	nd
Dibromochloromethane	1.0	nd	nd
Tetrachloroethene (PCE)	1.0	nd	nd
1,2-Dibromoethane (EDB)	1.0	nd	nd
Chlorobenzene	1.0	104%	nd
1,1,1,2-Tetrachloroethane	1.0	nd	nd
Bromoform	1.0	nd	nd
1,1,2,2-Tetrachloroethane	1.0	nd	nd
Bromobenzene	1.0	nd	nd
1,2,3-Trichloropropane	1.0	nd	nd
2-Chlorotoluene	1.0	nd	nd
4-Chlorotoluene	1.0	nd	nd
1,3-Dichlorobenzene	1.0	nd	nd
1,4-Dichlorobenzene	1.0	nd	nd
1,2-Dichlorobenzene	1.0	nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd	nd
1,2,4-Trichlorobenzene	1.0	nd	nd
Hexachloro-1,3-butadiene	1.0	nd	nd
1,2,3-Trichlorobenzene	1.0	nd	nd
Surrogate recoveries			
Dibromofluoromethane		113%	101%
Toluene-d8		107%	106%
4-Bromofluorobenzene		93%	106%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

ESN NORTHWEST CHEMISTRY LABORATORY

Department of Ecology
LOVITT MINE PROJECT
Client Project #51109
Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnvw.com

Analysis of Diesel Range Organics & Lube Oil Range Organics in Soil by Method NWTPH-Dx/Dx Extended

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (mg/kg)	Lube Oil Range Organics (mg/kg)
Method Blank	8/31/2010	8/31/2010	110%	nd	nd
CRO-LM-SB-1-26	8/31/2010	8/31/2010	98%	2000	nd
CRO-LM-SB-2-30	8/31/2010	8/31/2010	89%	5500	nd
CRO-LM-SB-2-33	8/31/2010	8/31/2010	86%	nd	nd
CRO-LM-SB-3-30	8/31/2010	8/31/2010	76%	nd	nd
CRO-LM-SB-4-23	8/31/2010	8/31/2010	87%	4400	nd
CRO-LM-SB-4-32	8/31/2010	8/31/2010	86%	3300	nd
CRO-LM-SB-Blind Dup2	8/31/2010	8/31/2010	93%	2200	nd
CRO-LM-SB-Blind Dup2 Dup	8/31/2010	8/31/2010	95%	2000	nd
Reporting Limits				50	100

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

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Client Project #51109
Wenatchee, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Halogenated Volatile Organic Compounds in Water by Method 8260

Analytical Results

8260B Halogenated, µg/L	MTH BLK	LCS	Trip Blank
Matrix	Reporting	Water	Water
Date analyzed	Limits	08/27/10	08/27/10
Dichlorodifluoromethane	1.0	nd	nd
Chloromethane	1.0	nd	nd
Vinyl chloride	0.2	nd	nd
Bromomethane	1.0	nd	nd
Chloroethane	1.0	nd	nd
Trichlorofluoromethane	1.0	nd	nd
1,1-Dichloroethene	1.0	72%	nd
Methylene chloride	1.0	nd	nd
trans-1,2-Dichloroethene	1.0	nd	nd
1,1-Dichloroethane	1.0	nd	nd
cis-1,2-Dichloroethene	1.0	nd	nd
2,2-Dichloropropane	1.0	nd	nd
Chloroform	1.0	nd	nd
Bromochloromethane	1.0	nd	nd
1,1,1-Trichloroethane	1.0	nd	nd
1,2-Dichloroethane (EDC)	1.0	nd	nd
1,1-Dichloropropene	1.0	nd	nd
Carbon tetrachloride	1.0	nd	nd
Trichloroethene (TCE)	1.0	108%	nd
1,2-Dichloropropane	1.0	nd	nd
Dibromomethane	1.0	nd	nd
Bromodichloromethane	1.0	nd	nd
cis-1,3-Dichloropropene	1.0	nd	nd
trans-1,3-Dichloropropene	1.0	nd	nd
1,1,2-Trichloroethane	1.0	nd	nd
1,3-Dichloropropane	1.0	nd	nd
Dibromochloromethane	1.0	nd	nd
Tetrachloroethene (PCE)	1.0	nd	nd
1,2-Dibromoethane (EDB)	1.0	nd	nd
Chlorobenzene	1.0	104%	nd
1,1,1,2-Tetrachloroethane	1.0	nd	nd
Bromoform	1.0	nd	nd
1,1,2,2-Tetrachloroethane	1.0	nd	nd
Bromobenzene	1.0	nd	nd
1,2,3-Trichloropropane	1.0	nd	nd
2-Chlorotoluene	1.0	nd	nd
4-Chlorotoluene	1.0	nd	nd
1,3-Dichlorobenzene	1.0	nd	nd
1,4-Dichlorobenzene	1.0	nd	nd
1,2-Dichlorobenzene	1.0	nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd	nd
1,2,4-Trichlorobenzene	1.0	nd	nd
Hexachloro-1,3-butadiene	1.0	nd	nd
1,2,3-Trichlorobenzene	1.0	nd	nd
Surrogate recoveries			
Dibromofluoromethane	113%	101%	107%
Toluene-d8	107%	104%	106%
4-Bromofluorobenzene	93%	106%	94%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

ATTACHMENT C
SOIL BORING LOGS

Depth Below Ground Surface (bgs) in feet	Sample Number	Sample Interval	Groundwater	% Recovery	PID (ppm)	Well Construction	Soil Log	Soil Description
5				100	0.1	Backfilled with hydrated bentonite chips.	SP	0'-5': Waste from air knifing. Appeared to be poorly sorted sand with gravel. 5'-9': Medium brown, poorly sorted sand with gravel. Moist, no odor. Appeared to be fill.
10				100				
15				100	0.1		SC/CL	9'-18': Medium brown with red and gray mottles, clayey sand grading to sandy clay at 15' with gravel and small pockets of sand. Moist, no odor.
20	CRO-LM-SB-1-19			100	72.8		CL	18'-19': Medium brown with dark gray soil at 19', sandy clay. Moist, slight petroleum odor.
					0.1		CL	19'-21': Medium brown, sandy clay with gravel. Moist, no odor. Appeared to be mine waste.
				100	0.1		SC	21'-22': Medium brown with light orange streaks, clayey, poorly sorted sand with thin clay lenses. Moist, no odor. Appeared to be mine waste.
					0.1		SP	22'-24': Medium brown with white flecks, poorly sorted coarse sand with gravel. Moist, no odor.
25	CRO-LM-SB-1-26			100	275		CL	24'-26': Medium brown with light brown streaks, sandy clay. Moist, no odor.
					0.1		CL	26'-26.5': Gray and dark gray, sandy clay. Moist, organic odor.
				100			CL	26.5'-30': Medium brown, sandy clay with gravel. Moist, no odor.
30								Soil boring ended at 30' bgs. Groundwater was not encountered.

Logged by: Luke Martinkosky Driller: ESN Northwest Drilling Method: Geoprobe Sampling Method: Acetate Liner Casing Type: Not Applicable (NA) Annular Pack: NA Slot Size: NA	Hammer Size: NA Date Drilled: 8/25/10 Hole Diameter: 2 inches Hole Depth: 30 feet Well Diameter: NA Well Depth: NA Screened Interval: NA	Depth to Water (First Encountered): Not Encountered Depth to Water (Static): Not Encountered
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Soils classified visually using the Unified Soils Classification System



3831 Stone Way N, Seattle, WA - 206-691-6169
www.kane-environmental.com

Soil Sampling
Lovitt Mine
2493 South Methow Street
Wenatchee, Washington

Soil Boring Log

Depth Below Ground Surface (bgs) in feet	Sample Number	Sample Interval	Groundwater	% Recovery	PID (ppm)	Well Construction	Soil Log	Soil Description
5				100	0.1	Backfilled with hydrated bentonite chips.	SP	0'-5': Waste from air knifing. Appeared to be poorly sorted sand with gravel. 5'-9': Medium brown, poorly sorted sand with gravel. Moist, no odor. Appeared to be fill.
10				100	0.1		SP	9'-12': Medium yellowish brown with orange and dark red mottles, clayey sand. Moist, no odor. Appeared to be fill.
15				100	0.1		SC/CL	12'-21': Medium brown with red and gray mottles, grading between clayey sand and sandy clay with gravel and small pockets of sand. Moist, no odor. Appeared to be fill.
20				100				
21	CRO-LM-SB-2:21-22			100	95.4		SC	21'-24': Black and dark gray, clayey sand. Moist, strong petroleum odor.
25	CRO-LM-SB-2:25			100	101		SC	24'-26': Gray, clayey sand with gravel. Moist, petroleum odor.
26				100	0.1		CL	26'-27': Medium brown with brownish red mottles, sandy clay with gravels and cobbles. Moist, no odor.
27	CRO-LM-SB-2:27-28				220		CL	27'-29': Gray, sandy clay. Moist, petroleum odor.
29				100	0.1		SC	29'-29.5': Medium brown with white mottles, sandy clay. Moist, no odor.
30								

Logged by: Luke Martinkosky
Driller: ESN Northwest
Drilling Method: Geoprobe
Sampling Method: Acetate Liner
Casing Type: Not Applicable (NA)
Annular Pack: NA
Slot Size: NA

Hammer Size: NA
Date Drilled: 8/25/10
Hole Diameter: 2 inches
Hole Depth: 33 feet
Well Diameter: NA
Well Depth: NA
Screened Interval: NA

Depth to Water (First Encountered): Not Encountered
Depth to Water (Static): Not Encountered

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Soil Sampling
Lovitt Mine
2493 South Methow Street
Wenatchee, Washington

Soil Boring Log

Boring LM-SB-2

Page 2 of 2

Depth Below Ground Surface (bgs) in feet	Sample Number	Sample Interval	Groundwater	% Recovery	PID (ppm)	Well Construction	Soil Log	Soil Description
	CRO-LM-SB-2-30			100	448		SC	29.5'-30.5': Light gray, clayey sand. Moist, petroleum odor.
	CRO-LM-SB-2-33			100	36.8		SP	30.5'-33': Medium brown, poorly sorted sand with trace clay. Moist, slight petroleum odor (possibly from smear).
35						Backfilled with hydrated bentonite chips.		
40								Soil boring ended at 33' bgs. Groundwater was not encountered.
45								
50								
55								
60								

Logged by: Luke Martinkosky
 Driller: ESN Northwest
 Drilling Method: Geoprobe
 Sampling Method: Acetate Liner
 Casing Type: Not Applicable (NA)
 Annular Pack: NA
 Slot Size: NA

Hammer Size: NA
Date Drilled: 8/25/10
Hole Diameter: 2 inches
Hole Depth: 33 feet
Well Diameter: NA
Well Depth: NA
Screened Interval: NA

Depth to Water (First Encountered):	Not Encountered
Depth to Water (Static):	Not Encountered

Soils classified visually using the Unified Soils Classification System



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Soil Sampling
Lovitt Mine
2493 South Methow Street
Wenatchee, Washington

Soil Boring Log

Depth Below Ground Surface (bgs) in feet	Sample Number	Sample Interval	Groundwater	% Recovery	PID (ppm)	Well Construction	Soil Log	Soil Description
						Backfilled with hydrated bentonite chips.	SP	0'-6": Medium brown, poorly sorted sand. Moist, no odor. Appeared to be fill.
				100	0.1		SP	6"-1': Yellow, poorly sorted sand. Moist, no odor. Appeared to be fill.
					0.1		SP	1'-2.5': Light brown, poorly sorted sand with cobbles and gravel. Moist, no odor. Appeared to be fill.
					0.1		SP	2.5'-3.5': Medium brown, poorly sorted sand with gravel. Moist, no odor. Appeared to be fill.
5					0.1		SP	3.5'-4.5': Gray, poorly sorted sand with gravel. Moist, no odor. Appeared to be fill.
				100	0.1		SP	4'-6': Medium and light brown, poorly sorted sand. Moist, no odor.
10				100	0.1		CL	6'-12': Medium brown, sandy clay with cobbles. Moist, no odor.
15				100	0.1		CL	12'-16': Medium brown with white mottles, sandy clay with cobbles. Moist, no odor.
				100	0.1		SP	16'-18': Medium brown with orange and white mottles, poorly sorted coarse sand. Moist, no odor.
					0.1		CL	18'-19': Medium brown with orange mottles, sandy clay. Moist, no odor.
20					0.1		SC	19'-20': Medium brown with orange mottles, clayey sand. Moist, no odor.
				100	0.1		SC	20'-24': Medium brown with orange and white mottles, clayey sand with gravel. Moist, no odor.
25					0.1		SC	24'-26': Light brown, clayey sand. Moist, no odor.
				100	0.1		SC	26'-27': Medium brown with orange and white mottles, clayey sand with gravel. Moist, no odor.
					0.1		SP	27'-30': Yellow brown, poorly sorted sand with trace clay. Moist, no odor.
30				100				Soil boring ended at 30' bgs. Groundwater was not encountered.

Logged by: Luke Martinkosky Driller: ESN Northwest Drilling Method: Geoprobe Sampling Method: Acetate Liner Casing Type: Not Applicable (NA) Annular Pack: NA Slot Size: NA	Hammer Size: NA Date Drilled: 8/25/10 Hole Diameter: 2 inches Hole Depth: 30 feet Well Diameter: NA Well Depth: NA Screened Interval: NA	Depth to Water (First Encountered): Not Encountered Depth to Water (Static): Not Encountered
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Soils classified visually using the Unified Soils Classification System



3831 Stone Way N, Seattle, WA - 206-691-6169
www.kane-environmental.com

Soil Sampling
Lovitt Mine
2493 South Methow Street
Wenatchee, Washington

Soil Boring Log

Depth Below Ground Surface (bgs) in feet	Sample Number	Sample Interval	Groundwater	% Recovery	PID (ppm)	Well Construction	Soil Log	Soil Description
								0'-3": Concrete.
				100	0.1	Backfilled with hydrated bentonite chips.	SC	3"-3': Light brown, clayey sand. Moist, no odor.
5					0.1		SP	3'-5': Grayish brown, clayey sand. Moist, no odor.
				100	0.1		SC	5'-6': Gray, clayey sand. Moist, no odor.
					0.1		SC	6'-7': Dark brown, clayey sand with trace silt. Moist, no odor.
					0.1		SP	7'-8': Yellowish brown, poorly sorted coarse sand with trace clay. Moist, no odor.
10				100				
				100				
15					0.1		CL/ SC	8'-22': Medium brown with orange mottles, grading between clayey sand and sandy clay with cobbles. Moist, no odor.
				100				
20								
				100	131		SW	22'-23': Medium brown, poorly sorted sand with thin clay lenses. Moist, slight solvent odor.
	CRO-LM-SB-4-23							
25					0.1		SC	23'-28': Yellowish brown and medium brown, clayey sand with cobbles. Moist, no odor.
				100	24.2		CL	28'-28.5': Light gray, sandy clay. Moist, petroleum odor.
					0.1		SC	28.5'-29': Medium brown with orange mottling, clayey sand with gravel. Moist, no odor.
	CRO-LM-SB-4-29.5			100	68.6		SC	29'-29.5': Gray and black, sand and clayey sand. Moist, petroleum odor.
30								

Logged by: Luke Martinkosky Driller: ESN Northwest Drilling Method: Geoprobe Sampling Method: Acetate Liner Casing Type: Not Applicable (NA) Annular Pack: NA Slot Size: NA	Hammer Size: NA Date Drilled: 8/25/10 Hole Diameter: 2 inches Hole Depth: 32 feet Well Diameter: NA Well Depth: NA Screened Interval: NA	Depth to Water (First Encountered): Not Encountered Depth to Water (Static): Not Encountered
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Soils classified visually using the Unified Soils Classification System



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www.kane-environmental.com

Soil Sampling
Lovitt Mine
2493 South Methow Street
Wenatchee, Washington

Soil Boring Log

Depth Below Ground Surface (bgs) in feet	Sample Number	Sample Interval	Groundwater	% Recovery	PID (ppm)	Well Construction	Soil Log	Soil Description
	CRO-LM-SB-4-32			100	10.9	Backfilled with hydrated bentonite chips.	SW	29.5'-32': Medium brown with orange mottles, poorly sorted sand with gravel. Moist, petroleum odor.
35								
40								Soil boring ended at 32' bgs. Groundwater was not encountered.
45								
50								
55								
60								

Logged by: Luke Martinkosky	Hammer Size: NA	Depth to Water (First Encountered): Not Encountered
Driller: ESN Northwest	Date Drilled: 8/25/10	Depth to Water (Static): Not Encountered
Drilling Method: Geoprobe	Hole Diameter: 2 inches	
Sampling Method: Acetate Liner	Hole Depth: 32 feet	
Casing Type: Not Applicable (NA)	Well Diameter: NA	
Annular Pack: NA	Well Depth: NA	
Slot Size: NA	Screened Interval: NA	
Soils classified visually using the Unified Soils Classification System		



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Soil Sampling
Lovitt Mine
2493 South Methow Street
Wenatchee, Washington

Soil Boring Log

ATTACHMENT D
FIELD NOTES

Q

Lovitt Mine 8/25/10⁷

LM onsite 0755
ESN already onsite
(Noel & Chris - Drillers)
(Marty & Rich - Air Knife)
Utility Plus, onsite 0820
(Rich)

H & S meeting

Site ID - ^{CR}LM

due to size of
Ecology (Jason S.) onsite 910

- due to size of site & ^{former} VST presence of concrete slab beneath sand, overhead & underground utilities, Jason S. & LM agreed to start w/ 3 borings

SB-1 Lovitt 8/25/10
PID b-gran

0-5' air knifed, med. brn
poor sand w/ gravel

5-8' same 0.1 0.1

8-9' same

9-12' med. brn, clayey sand 0.1 0.1

w/ gravels, red, grey
mottling, moist, no

odor, small sand areas (mine waste?)

~~12-16~~ a few gravels

12-16, same, grading 0.1 0.1

+ sandy clay @

16-18 18' (mine waste?)

16-18 same 0.1 0.1

~~18-20~~ med brn, sandy 2.8 0.1

18-19 clay, moist,

@ 20' dk. grey soil

w/ slight petro odor

CR0-LM-SB-1-20

@ 1150
2 VOA, 1 jar

19-21 med. brn. sandy clay w/
co gravels, moist, no odor
(mine waste?)

Lovitt 8/25
PID b-gran

21-22 med. brn. clayey, ~~poor~~
poor sand w/lt. orange 0.1 0.1
streaks & thin clay lenses
(mine waste?)

22-24 med. brn, poor, coarse 0.1 0.1
sand w/ white flecks
& gravels

24-25 med. brn. poor 0.1 0.1
sandy clay w/ lt.
brn streaks

25-26 same 0.1 0.1

26-26.5 med. brn grey 2.75 0.1

dk. grey, sandy
clay, moist, organic
odor

CR0-LM-SB-1-26 @ 1210
2 VOA, 1 jar

26.5-30 med. brn, sandy clay 0.1 0.1
w/ gravel

Lovitt

8/25

	SA-2	PID	b-ground
0-5'	as SA-1		
5-8'	same	0.1	0.1
8-9'	same	0.1	0.1
9-12	med yllw brn., w/ orange + dk. red mottles. clayey	0.1	0.1
	sand, moist no odor		
12-15	as SA-1, ^{2nd} sandy loam	0.1	
15-18	same grading back to clayey sand		
18-20	same, moist no odor (all fill/waste)		
20-21	same	0.1	0.1
21-22	dk. ^{black} grey, clayey sand, moist, strong petro odor	15.4	0.1

CRO-LM-SB-2: 21-22 @ 1350

2 VOA, 1 jar

CRO-LM-SB-6 blind

Dup

2 VOA, 1 jar

Lovitt

8/25/18

		PID	b-ground
22-24	same	9.5	0.1
24-25	grey w/ gravel, clayey, med sand moist, petro odor (slight smell difference from the black material)	10.1	0.1

CRO-LM-SB-2-25 @ 1400

2 VOA, 1 jar

25-26	same	84.7	0.1
26-27	med brn. w/ brn red mottles & cobble sandy clay, moist, no odor	0.1	0.1
27-28	grey sandy clay moist, petro odor	220	0.1

CRO-LM-SB-2: 27-28 @ 1420

2 VOA, 1 jar

28-29	same	95.9	0.1
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Lovitt

8/25/10

		PIN	B-ground
29-29.5	med. brn w/ white sandy clay, moist no odor	0.1	0.1
29.5-30.5	lt. grey, clayey sand, moist petro odor	448	0.1
30.5-31	med. brn, clay poor sand w/ clay moist, slight odor, possibly iron smear	4.9	0.1

CR0-LM-SB-2-30 @ 1435
2 vOA, 1 jar

CR0-LM-SB-Blind
Oup 2

CR0-LM-SB-2-33 @ 1450
2 vOA, 1 jar

Lovitt

8/25/10

		PIN	B-ground
1-32	as 30.5-31	27.9	0.1
32-33	med brn, poor sand w/ trace clay	36.8	0.1
SB-3			
0-6"	med brn. poor sand, moist, no odor		
6"-1'	yellow, poor sand moist, no odor		
1-2.5'	brn, poor sand w/ cobbles gravel, dry, no odor	0.1	0.1
2.5-3.5'	med brn. poor sand w/ gravel, moist no odor	0.1	0.1
3.5-4'	grey, same texture		
4-6'	med + lt. brn, poor sand, moist, no odor	0.1	0.1
6-8'	med. brn, sandy clay w/ cobbles, moist no odor	0.1	0.1
8-12'	same	2.1	0.1

Lovitt

8/25/10

#		PID	6
12-16	med brn. sand, clay w/ cobbles white mottles, moist, no odor	0.1	0.1
16-18	med br. w/ orange + white mottles, poor	0.1	0.1
	Coarse sand, moist, no odor		
18-19	med br. w/ orange mottles, sand, clay moist, no odor	0.1	
19-20	med. br. w/ orange mottles, clayey med sand, moist, no odor	0.1	0.1
20-24	same w/ white mottles + gravel	0.1	0.1
24-26	lt. brn. poor, clayey sand, moist, no odor	0.1	0.1
26-27	as 20-24		
27-30	yellow brn, poor sand w/ clay, moist, no odor	0.1	0.1

CRO-LM-SB 3-30 @ 15 ft

2 voc, 1 jar

Lovitt

8/25/10

S B-4		PID	6
0-3'	conc.		
3'-3'	lt. brn. clayey sand moist, no odor	0.1	0.1
3-4	greyish brn. same texture, moist, none	0.1	
4-5	same	0.1	
5-6	grey. clayey sand, moist, no odor	0.1	
6-7	dk. brn. clayey sand w/ trace silt, moist, no odor	0.1	
7-8	yellowish brn, poor coarse sand w/ trace clay, moist, no odor	0.1	
8-12	med brn w/ orange, mottles, moist, med sandy clay, w/ cobbles	0.1	
12-16	same, middle & A sandy clay + clayey sand	0.1	
16-20	same	0.1	
20-22	same	0.1	

lower

Lovitt

8/25/10

PTD 6.1

22-23 med brn., poor sand
w/ thin clay lenses,
moist, solvent odor

CRO-LM-SB-4-23 @ 1635
2 VOA, 1 jar

23-27 yellow brn. & med
brn., poor sand w/ clay
& cobbles, moist, no odor

27-28 same 0.1 0.1

28-28.5 lt. gray, sandy 24.2 0.1
clay, petro odor

28.5-29 med. brn., clayey 0.1 0.1
sand w/ orange mottles
& gravel, moist, no odor

29-29.9 grey & black, sand 68.6 0.1
+ clayey sand, moist,
petro odor

29.5-32 med brn., w/ orange
mottles, poor sand w/
clay & gr 10.9 0.1

Lovitt

8/25/10

CRO-LM-SB-4-32

@ 1700

2 VOA, 1 jar

CRO-LM-SB-4-29.5

@ 1645

2 VOA, 1 jar

1-15 gal. drum

LM off site 9715