REPORT OF FINDINGS

Environmental Investigation
Tank Removal Site
5200 NW Front Avenue
Portland, Oregon

Prepared for:

Tube Forging of America
3121 Southwest Moody Avenue
Portland, Oregon 97201

Prepared by:

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Portland, Oregon 97201

April 20, 1989

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REPORT OF FINDINGS

Environmental Investigation
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5200 NW Front Avenue
Portland, Oregon

1.0 INTRODUCTION

On January 30, 1989, Century West Engineering Corporation (Century West) began field activities on an environmental investigation of a tank removal site owned by Mr. Emery Zidell. Mr. Zidell purchased the site in September of 1978. Two 20,000-gallon steel underground storage tanks were removed from the site in November, 1988 to comply with the Department of Environmental Quality rules and regulations pertaining to Underground Storage Tanks.

Prior to September, 1978 the tanks are believed to have contained Bunker C, heating oil and/or other petroleum products. The tanks have not been used by Mr. Zidell or the present lessee of the site, Tube Forging of America ("TFA").

During the excavation of fill and soils and subsequent removal of the tanks, petroleum hydrocarbon stained soils were observed. Soil samples were collected from the northwest corner of the excavation, approximately two feet below the surface, and from the southwest corner of the bottom of the excavation. The samples were analyzed for flashpoint, PCB, oil and grease, and EP toxicity metals. Oil and grease concentrations of 4.8 and 5.3 percent were identified.

This environmental investigation was initiated to collect subsurface information and evaluate subsurface soil and ground water contamination. This findings of the investigation is presented in the following sections:

2.0 Literature Search

3.0 Subsurface Investigation

4.0 Analytical Data

5.0 Regulatory Statues

6.0 Conclusions and Recommendations

2.0 LITERATURE SEARCH

A search was made of the Oregon Department of Environmental Quality (DEQ) files for information regarding confirmed or suspected releases from surrounding properties and the quality of the ground water in the general vicinity of the Tube Forging facility.

The following companies, located in the vicinity of the TFA facility, have been placed on the DEQ's Hazardous Substance Facility Inventory of Confirmed Release:

Chevron USA-Willbridge	5531 NW Doane Ave., Portland
Gould, Inc.	5909 NW 61st St., Portland
Shell Oil Co.-Willbridge	5880 NW St. Helens, Portland

The Hazardous Substance Facility Inventory is composed of sites that the DEQ has evidence of a release of hazardous substances to the environment. Inclusion of a site on the Inventory does not mean that the site is a State or Federal Superfund site. However, some sites on the Inventory do pose a threat to the environment.

The following companies, located in the vicinity of the Tube Forging facility, are on the Comprehensive Environmental Response, Compensation and Liability Information System List (CERCLIS):

Chevron USA Asphalt Ref.	5501 NW Front, Portland
Chevron USA Willbridge Term.	5531 NW Doane Ave., Portland
Doane Lake	5900 NW 61st St., Portland
Gilmore Steel	6161 NW 61st St., Portland
Liquid Air-Acetylene Plant	6500 NW Front, Portland
Shell Oil-Willbridge	5880 NW St. Helens, Portland

This list is used by the Environmental Protection Agency as a means to track potential federal Superfund Sites. Inclusion of a site on the CERCLIS does not mean that the site is a Superfund site or that the site presents a threat to the environment. Some sites on the CERCLIS do pose a threat to the environment.

3.0 SUBSURFACE INVESTIGATION

The collection of soil and ground water samples during the course of this investigation were designed to evaluate whether significant environmental impairment has occurred. The field activities conducted and the subsequent data collected are presented in the following sections:

3.1 Investigative Borings

3.2 Soil Sampling

3.3 Ground Water Sampling

3.1 Investigative Borings

The investigative boring program consisted of drilling four investigative borings at the locations shown on Figure 1. The borings were located in a manner which would enable soils on three sides of the excavation to be sampled. Three investigative borings, IB-4 to the west, IB-3 to the south, and IB-1 to the east of the excavation, were located to observe and collect soils for analysis from the immediate vicinity of the excavation. The fourth boring, IB-2, was located approximately 65 feet east of the excavation. The purpose of IB-2 was to observe the soil conditions at a distance downgradient of the excavation and provided qualitative information about soil conditions near the Willamette River.

During the drilling operations, soils samples were continuously collected for observation. Subsurface exploration logs were used to record information on soil types and evidence of potential contamination (visual and odoriferous).

3.2 Soil Sampling

Soil samples were continuously collected and visually classified. All soil samples collected for analysis were placed in laboratory-cleaned sample containers and placed with Blue Ice in an isolation container. During advancement of the boring, the field geologist selected two samples from each of the three borings closest to the excavation (IB-1, IB-3 and IB-4) for analysis. Sample selection was based on obvious petroleum odors, petroleum staining, or the soil sample's relationship to the bottom of the excavation.

The following soil samples collected from the depths indicated were shipped to the laboratory for analysis:

Boring	Intervals Sampled
IB-1(A)	12 foot
IB-1(B)	14 foot
IB-3(A)	12 foot
IB-3(B)	18 foot
IB-4(A)	9 foot
IB-4(B)	18 foot

Soil samples were analyzed for oil and grease and the volatile organic fraction and the base/neutral/acid organic fractions of the Environmental Protection Agency's (EPA) Priority Pollutants.

The most visually petroleum stained soils observed in the field were in IB-3B and IB-4. Samples from the 18 foot sample interval from both borings were the most visually stained. There was a sharp delineation between the slightly contaminated soils above approximately 13 feet and highly visible stained soils below 13 feet.

No visual or odoriferous evidence was noted while drilling IB-2. None of the soil samples were stained by petroleum hydrocarbons nor were petroleum odors noted during drilling. This data from IB-2 indicates that petroleum products from the underground tanks did not travel any significant distance from the tank site.

3.3 Ground Water Sampling

A ground water sample for analysis was collected from IB-1 located east of and adjacent to the excavation. The ground water was sampled using a stainless steel bailer. The sample was placed in laboratory-cleaned glass sample containers and placed with Blue Ice in an isolation container with a travel blank. The ground water sample was analyzed for the volatile organic fraction and base/ neutral/acid organic fractions of the EPA's Priority Pollutants. The travel blank was transported with the ground water sample and analyzed for the volatile organic fraction of the EPA's Priority Pollutants.

4.0 ANALYTICAL DATA

Analytical data for the soils and ground water samples collected from the borings is presented in Table 1. Appendix A presents the laboratory data sheets for the soil and ground water samples analyzed.

4.1 Soils

The highest levels of contamination were found in investigative borings IB-3 and IB-4 at 18 feet. The compounds found in the greatest concentrations in IB-3, acetone and tetrachloroethane, and IB-4, chloroform and methylene chloride, are commonly used solvents. Available data indicates that these compounds are not used by TFA. These compounds are not common constituents of diesel fuel or bunker C fuels. Thus, the source of these compounds is not the underground storage tanks removed nor a result of current activities conducted on site.

The high oil and grease concentrations found in IB-3B and IB-4B, 5.5 and 8.7 percent, respectively, are indicative of a release from the underground storage tanks.

4.2 Ground Water

Analytical data from the ground water sample indicates that the ground water is not significantly impacted by volatile compounds. Only one volatile compound, 1,2 dichloroethene, was identified at 0.4 parts per billion. The presence of this compound is not believed to be associated with the underground tanks removed or current activities conducted at the site.

The phthalate compounds identified in the ground water are prevalent throughout industrialized areas. The wide spread presence of these compounds in the environment and the fact that other semi-volatile compounds were not identified in ground water (i.e. poly aromatic hydrocarbons commonly associated with bunker C), indicates that the underground tanks were not the source of these compounds.

5.0 APPLICABLE STATUTES

The release of petroleum products to the environment is regulated

under OAR 340-122-120 CORRECTIVE ACTION FOR PETROLEUM UST SYSTEMS.

Under OAR 340-122-120 (3) the responsible person is required to reporting and abatement requirements which include, but are not limited to:

1. Stopping further release,

2. Removing and properly disposing of visually contaminated soil,

3. Reporting initial corrective action, including verification of tank repair or closure, and

4. Conducting an investigation to determine the presence of free product.

In addition to the above, OAR 340-122-120 (5)(a) requires an additional site investigation whenever there is reason to suspect that soil remaining is contaminated or that ground water contamination may be present.

OAR 340-122-120 (6) sets numerical standards for clean-up of soils from underground storage tank site and OAR 340-122-120 (7) requires that a corrective action plan be submitted to the DEQ for approval.

At this time TFA has initiated activities to begin compliance with the OAR 340-122-120 (3). Presented below are the activities conducted which correspond to the requirements of OAR 340-122-120 (3).

1. In November of 1988 the underground tanks were removed from the site.

2. During the removal of the tanks, visually stained soils were excavated and disposed of at the Circle "C" Landfill in Vancouver, Washington.

3. This document constituents a report of the initial corrective action.

4. This document presents the findings of an environmental investigation to characterize extent of the presence of any remaining free product.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations are presented below.

6.1 Conclusions

Based on the data it is evident that petroleum hydrocarbon products are present in soils and ground water of the tank site. Acetone, chloroform, 1,2 dichloroethene, methylene chloride, tetrachloroethane, and phthalates were identified at the tank site. However, the source of these substances is not believed to be the underground tanks removed or TFA's activities conducted at the site.

The data from IB-2 shows that the petroleum products in the subsurface environment have not migrated from the underground tank site.

6.2 Recommendations

The analytical data (oil and grease concentrations) shows that a petroleum product has been released from the under ground tanks. This release is regulated under the Oregon DEQ CORRECTIVE ACTION FOR PETROLEUM UST SYSTEM regulations (OAR 340-122-122).

The following recommendations are made with regard to the soil contamination present.

1. Inform the DEQ of the data and intent to close the site under the DEQ's Corrective Action For Petroleum UST Systems regulations.

2. Provide a written Closure Plan to the DEQ after presentation of the current data. The Closure Plan developed will propose In-situ Closure as provide rationale for such closure, including:

    a. Data to show that the petroleum product in the subsurface soil is not mobile.

    b. Data to show that the petroleum product is not impacting a drinking water resource.

    c. Data to show that the Willamette River has not been impacted by the release.

d. Provide data to shows that placing a relatively impermeable cap over the tank site will prevent the infiltration of precipitation and eliminating a potential mechanism which could induce migration of the petroleum product from the tank site.

e. Provide details of the closure such as the placement of a filter fabric prior to placement of backfill.

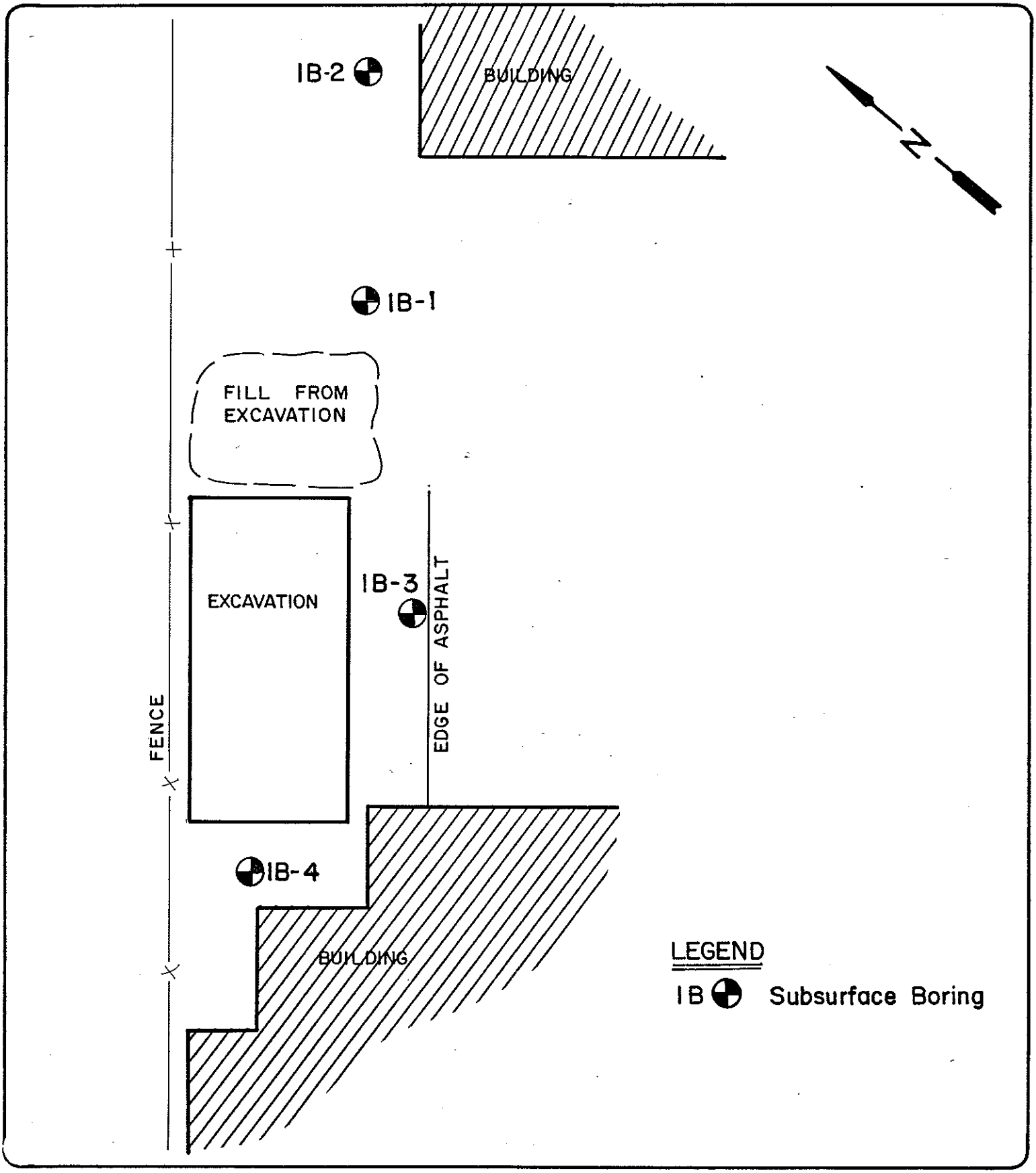
f. Provide information pertaining to the fate of the underground tanks (i.e. the tanks have been rendered useless as underground tanks and have been recycled for alternative use).

TABLE 1

ANALYTICAL RESULTS OF ENVIRONMENTAL INVESTIGATION--TANK REMOVAL

Compound	EPA ID#	Concentration (Soil sample values in ug/kg (ppb), water values in ug/l (ppb)								
		1B-1A	1B-1B	1B-3A	1B-3B	1B-4A	1B-4B	Water	Travel Blank	Soil Blank
Volatile Fraction:		12'	14'	12'	18'	9'	18'			
Acetone	U002	ND	ND	5	83	ND	ND	ND	16	ND
Chloroform	U044	ND	1	11	ND	1	31,000	ND	9	ND
1,2 Dichloroethene (total)	U079	ND	ND	ND	ND	ND	ND	0.4	ND	ND
Methylene Chloride	U080	0.5	ND	ND	ND	ND	12,000	ND	ND	ND
Tetrachloroethane	U210	ND	ND	ND	17	ND	ND	ND	ND	ND
Semi-Volatile:										
Dimethylphthalate	U102	ND	ND	ND	ND	ND	ND	10	--	--
Di-n-Butylphthalate	U069	ND	ND	ND	ND	ND	ND	158	--	--
Oil and Grease (Values in mg/kg [ppm]):										
Oil and Grease		<100	<100	<100	25,288	<100	24,330	--	--	--

-- = Not analyzed ND = None detected ppm = parts per million ppb = parts per billion



DESIGN BY	JS	CHECKED BY	JS	BORING LOCATIONS	APPROVED	CENTURY WEST ENGINEERING CORPORATION
SURVEY BY		SCALE	1" ≈ 20'	Tube Forging of America	DATE Feb 89	
DRAWN BY	CG	DWG. NO.				

APPENDIX A

LABORATORY DATA SHEETS

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

CWEC - PDX
(TFEI)

CONSTITUENT: OIL & GREASE, SOIL
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
JOB NUMBER: --
COLLECTED BY: J. SPRECHER

LAB SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE CONCENTRATION* (mg/kg)
3310-1	BH-1 12'	<100
3310-2	BH-1 14'	<100
3310-4	BH-3 9'	<100
3310-5	BH-3 18'	25288
3310-6	BH-4 12'	<100
3310-7	BH-4 18'	24330

*N.D. means "not detected."

METHOD: SM 503E - Gravimetric Method

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-BLANK
SAMPLE DESCRIP.: BLANK FOR LOW SOIL
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER:
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	N.D.	5	ug/kg
Acetone	N.D.	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	N.D.	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

Century Testing Laboratories, Inc.

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503-382-6432

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3301-BLANK
SAMPLE DESCRIP.: BLANK FOR LOW SOIL
DATE REPORTED: 02/14/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER:
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	N.D.	5	ug/kg
Acetone	N.D.	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	N.D.	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

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CWEC (PDX) TFEI (3301-BL)
CTL * Volatiles

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	80%
Toluene-D8	86%
Bromofluorobenzene	88%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. MRJ

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Mel Tillman for JHT
John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

CWEC (PDX) TFEI (

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-1
SAMPLE DESCRIP.: BH-1 12'
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER:
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride pg 677	0.5	5	ug/kg
Acetone	N.D.	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	N.D.	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

Paint removers
solvent degres.
pk Process.

Century Testing
Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

CWEC (PDX) TFEI (3301-BLANK)
CTL * Volatiles

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg

OTHER CONSTITUENTS FOUND
#

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	78%
Toluene-D8	84%
Bromofluorobenzene	86%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. MRJ

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Mel Tillman for JHT
John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

SEMI-VOLATILES - SOIL

CWEC - PDX
(TFEI)

ANALYSIS METHOD NO.:	EPA 625/8270
LAB SAMPLE NO.:	3310-1
SAMPLE DESCRIP.:	BH-1-12'
DATE REPORTED:	02/24/89
DATE SUBMITTED:	2/1/89
DISCARD DATE:	3/1/89
P.O. NUMBER:	4008200101
COLLECTED BY:	Client

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Phenol	N.D.	330	ug/kg
Aniline	N.D.	330	ug/kg
bis(2-Chloroethyl)ether	N.D.	330	ug/kg
2-Chlorophenol	N.D.	330	ug/kg
1,3-Dichlorobenzene	N.D.	330	ug/kg
1,4-Dichlorobenzene	N.D.	330	ug/kg
Benzyl alcohol	N.D.	330	ug/kg
1,2-Dichlorobenzene	N.D.	330	ug/kg
2-Methylphenol	N.D.	330	ug/kg
bis(2-Chloroisopropyl)ether	N.D.	330	ug/kg
4-Methylphenol	N.D.	330	ug/kg
N-Nitroso-di-n-propylamine	N.D.	330	ug/kg
Hexachloroethane	N.D.	330	ug/kg
Nitrobenzene	N.D.	330	ug/kg
Isophorone	N.D.	330	ug/kg
2-Nitrophenol	N.D.	330	ug/kg
2,4-Dimethylphenol	N.D.	330	ug/kg
Benzoic acid	N.D.	1600	ug/kg
bis(2-Chloroethoxy)methane	N.D.	330	ug/kg
k2,4-Dichlorophenol	N.D.	330	ug/kg
1,2,4-Trichlorobenzene	N.D	330	ug/kg
Naphthalene	N.D.	330	ug/kg
4-Chloroaniline	N.D.	330	ug/kg
Hexachlorobutadiene	N.D.	330	ug/kg
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	N.D.	330	ug/kg

*N.D. means "not detected."

Century Testing Laboratories, Inc.

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CWEC-PDX (TFEI)
CTL 3310-1
Semi-Volatiles
Page 2

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
2-Methylnaphthalene	N.D.	330	ug/kg
Hexachlorocyclopentadiene	N.D.	330	ug/kg
2,4,6-Trichlorophenol	N.D.	330	ug/kg
2,4,5-Trichlorophenol	N.D.	1600	ug/kg
2-Chloronaphthalene	N.D.	330	ug/kg
2-Nitroaniline	N.D.	1600	ug/kg
Dimethylphthalate	N.D.	330	ug/kg
Acenaphthylene	N.D.	330	ug/kg
2,6-Dinitrotoluene	N.D.	330	ug/kg
3-Nitroaniline	N.D.	1600	ug/kg
Acenaphthene	N.D.	330	ug/kg
2,4-Dinitrophenol	N.D.	1600	ug/kg
4-Nitrophenol	N.D.	1600	ug/kg
Dibenzofuran	N.D.	330	ug/kg
2,4-Dinitrotoluene	N.D.	330	ug/kg
Diethylphthalate	N.D.	330	ug/kg
4-Chlorophenyl-phenyl ether	N.D.	330	ug/kg
Fluorene	N.D.	330	ug/kg
4-Nitroanililne	N.D.	1600	ug/kg
4,6-Dinitro-2-methylphenol	N.D.	1600	ug/kg
N-nitrosodiphenylamine	N.D.	330	ug/kg
4-Bromophenyl-phenylether	N.D.	330	ug/kg
Hexachlorobenzene	N.D.	330	ug/kg
Pentachlorophenol	N.D.	1600	ug/kg
Phenanthrene	N.D.	330	ug/kg
Anthracene	N.D.	330	ug/kg
Di-n-Butylphthalate	N.D.	330	ug/kg
Fluoranthene	N.D.	330	ug/kg
Pyrene	N.D.	330	ug/kg
Butylbenzylphthalate	N.D.	330	ug/kg
3,3'-Dichlorobenzidine	N.D.	660	ug/kg
Benzo(a)anthracene	N.D.	330	ug/kg
Chrysene	N.D.	330	ug/kg
bis(2-Ethylhexyl)phthalate	N.D.	330	ug/kg
Di-n-octylphthalate	N.D.	330	ug/kg
Benzo(b)fluoranthene	N.D.	330	ug/kg
Benzo(k)fluoranthene	N.D.	330	ug/kg
Benzo(a)pyrene	N.D.	330	ug/kg
Indeno(1,2,3-cd)pyrene	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC - PDX (TFEI)
CTL 3310-1 Semi-Volatiles
Page 3

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Dibenz(a,h)anthracene	N.D.	330	ug/kg
Benzo(g,h,i)perylene	N.D.	330	ug/kg

OTHER CONSTITUENTS FOUND
None

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
2-Fluorophenol (Surrogate Spike)	42%
Phenol-D5 (Surrogate Spike)	66%
Nitrobenzene-D5 (Surrogate Spike)	50%
2-Fluorobiphenyl (Surrogat Spike)	136%
2,4,6-Tribromophenol (Surrogate Spike)	88%
P-Terphenyl-D14 (Surrogate Spike)	96%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

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LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-2
SAMPLE DESCRIP.: BH-1 14'
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER: --
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	N.D.	5	ug/kg
Acetone	N.D.	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform (67-66-3)	1	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

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CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg

OTHER CONSTITUENTS FOUND
#

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	76%
Toluene-D8	89%
Bromofluorobenzene	88%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jmO

Century Testing Laboratories, Inc.

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503-382-6432

LABORATORY ANALYSIS

SEMI-VOLATILES - SOIL

CWEC - PDX
(TFEI)

ANALYSIS METHOD NO.: EPA 625/8270
LAB SAMPLE NO.: 3310-2
SAMPLE DESCRIP.: BH-1-14'
DATE REPORTED: 02/24/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 3/1/89
P.O. NUMBER: 4008200101
COLLECTED BY: Client

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Phenol	N.D.	330	ug/kg
Aniline	N.D.	330	ug/kg
bis(2-Chloroethyl)ether	N.D.	330	ug/kg
2-Chlorophenol	N.D.	330	ug/kg
1,3-Dichlorobenzene	N.D.	330	ug/kg
1,4-Dichlorobenzene	N.D.	330	ug/kg
Benzyl alcohol	N.D.	330	ug/kg
1,2-Dichlorobenzene	N.D.	330	ug/kg
2-Methylphenol	N.D.	330	ug/kg
bis(2-Chloroisopropyl)ether	N.D.	330	ug/kg
4-Methylphenol	N.D.	330	ug/kg
N-Nitroso-di-n-propylamine	N.D.	330	ug/kg
Hexachloroethane	N.D.	330	ug/kg
Nitrobenzene	N.D.	330	ug/kg
Isophorone	N.D.	330	ug/kg
2-Nitrophenol	N.D.	330	ug/kg
2,4-Dimethylphenol	N.D.	330	ug/kg
Benzoic acid	N.D.	1600	ug/kg
bis(2-Chloroethoxy)methane	N.D.	330	ug/kg
k2,4-Dichlorophenol	N.D.	330	ug/kg
1,2,4-Trichlorobenzene	N.D	330	ug/kg
Naphthalene	N.D.	330	ug/kg
4-Chloroaniline	N.D.	330	ug/kg
Hexachlorobutadiene	N.D.	330	ug/kg
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC-PDX (TFEI)
CTL 3310-2
Semi-Volatiles
Page 2

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
2-Methylnaphthalene	N.D.	330	ug/kg
Hexachlorocyclopentadiene	N.D.	330	ug/kg
2,4,6-Trichlorophenol	N.D.	330	ug/kg
2,4,5-Trichlorophenol	N.D.	1600	ug/kg
2-Chloronaphthalene	N.D.	330	ug/kg
2-Nitroaniline	N.D.	1600	ug/kg
Dimethylphthalate	N.D.	330	ug/kg
Acenaphthylene	N.D.	330	ug/kg
2,6-Dinitrotoluene	N.D.	330	ug/kg
3-Nitroaniline	N.D.	1600	ug/kg
Acenaphthene	N.D.	330	ug/kg
2,4-Dinitrophenol	N.D.	1600	ug/kg
4-Nitrophenol	N.D.	1600	ug/kg
Dibenzofuran	N.D.	330	ug/kg
2,4-Dinitrotoluene	N.D.	330	ug/kg
Diethylphthalate	N.D.	330	ug/kg
4-Chlorophenyl-phenyl ether	N.D.	330	ug/kg
Fluorene	N.D.	330	ug/kg
4-Nitroaniline	N.D.	1600	ug/kg
4,6-Dinitro-2-methylphenol	N.D.	1600	ug/kg
N-nitrosodiphenylamine	N.D.	330	ug/kg
4-Bromophenyl-phenylether	N.D.	330	ug/kg
Hexachlorobenzene	N.D.	330	ug/kg
Pentachlorophenol	N.D.	1600	ug/kg
Phenanthrene	N.D.	330	ug/kg
Anthracene	N.D.	330	ug/kg
Di-n-Butylphthalate	N.D.	330	ug/kg
Fluoranthene	N.D.	330	ug/kg
Pyrene	N.D.	330	ug/kg
Butylbenzylphthalate	N.D.	330	ug/kg
3,3'-Dichlorobenzidine	N.D.	660	ug/kg
Benzo(a)anthracene	N.D.	330	ug/kg
Chrysene	N.D.	330	ug/kg
bis(2-Ethylhexyl)phthalate	N.D.	330	ug/kg
Di-n-octylphthalate	N.D.	330	ug/kg
Benzo(b)fluoranthene	N.D.	330	ug/kg
Benzo(k)fluoranthene	N.D.	330	ug/kg
Benzo(a)pyrene	N.D.	330	ug/kg
Indeno(1,2,3-cd)pyrene	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC - POX (TFEI)
CTL 3310-2 Semi-Volatiles
Page 3

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Dibenz(a,h)anthracene	N.D.	330	ug/kg
Benzo(g,h,i)perylene	N.D.	330	ug/kg

OTHER CONSTITUENTS FOUND
None

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
2-Fluorophenol (Surrogate Spike)	36%
Phenol-D5 (Surrogate Spike)	60%
Nitrobenzene-D5 (Surrogate Spike)	40%
2-Fluorobiphenyl (Surrogat Spike)	108%
2,4,6-Tribromophenol (Surrogate Spike)	88%
P-Terphenyl-D14 (Surrogate Spike)	76%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-4
SAMPLE DESCRIP.: BH-3 9'
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER:
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	N.D.	5	ug/kg
Acetone	5	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	11	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

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CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg

OTHER CONSTITUENTS FOUND
#

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	76%
Toluene-D8	84%
Bromofluorobenzene	88%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. MRJ

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Mel Tillman for JHT
John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

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503-382-6432

LABORATORY ANALYSIS

SEMI-VOLATILES - SOIL

CWEC - PDX
(TFEI)

ANALYSIS METHOD NO.: EPA 625/8270
LAB SAMPLE NO.: 3310-4
SAMPLE DESCRIP.: BH-3-9'
DATE REPORTED: 02/24/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 3/1/89
P.O. NUMBER: 4008200101
COLLECTED BY: Client

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Phenol	N.D.	330	ug/kg
Aniline	N.D.	330	ug/kg
bis(2-Chloroethyl)ether	N.D.	330	ug/kg
2-Chlorophenol	N.D.	330	ug/kg
1,3-Dichlorobenzene	N.D.	330	ug/kg
1,4-Dichlorobenzene	N.D.	330	ug/kg
Benzyl alcohol	N.D.	330	ug/kg
1,2-Dichlorobenzene	N.D.	330	ug/kg
2-Methylphenol	N.D.	330	ug/kg
bis(2-Chloroisopropyl)ether	N.D.	330	ug/kg
4-Methylphenol	N.D.	330	ug/kg
N-Nitroso-di-n-propylamine	N.D.	330	ug/kg
Hexachloroethane	N.D.	330	ug/kg
Nitrobenzene	N.D.	330	ug/kg
Isophorone	N.D.	330	ug/kg
2-Nitrophenol	N.D.	330	ug/kg
2,4-Dimethylphenol	N.D.	330	ug/kg
Benzoic acid	N.D.	1600	ug/kg
bis(2-Chloroethoxy)methane	N.D.	330	ug/kg
k2,4-Dichlorophenol	N.D.	330	ug/kg
1,2,4-Trichlorobenzene	N.D	330	ug/kg
Naphthalene	N.D.	330	ug/kg
4-Chloroaniline	N.D.	330	ug/kg
Hexachlorobutadiene	N.D.	330	ug/kg
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC-PDX (TFEI)
CTL 3310-4 Semi-Volatiles
Page 2

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
2-Methylnaphthalene	N.D.	330	ug/kg
Hexachlorocyclopentadiene	N.D.	330	ug/kg
2,4,6-Trichlorophenol	N.D.	330	ug/kg
2,4,5-Trichlorophenol	N.D.	1600	ug/kg
2-Chloronaphthalene	N.D.	330	ug/kg
2-Nitroaniline	N.D.	1600	ug/kg
Dimethylphthalate	N.D.	330	ug/kg
Acenaphthylene	N.D.	330	ug/kg
2,6-Dinitrotoluene	N.D.	330	ug/kg
3-Nitroaniline	N.D.	1600	ug/kg
Acenaphthene	N.D.	330	ug/kg
2,4-Dinitrophenol	N.D.	1600	ug/kg
4-Nitrophenol	N.D.	1600	ug/kg
Dibenzofuran	N.D.	330	ug/kg
2,4-Dinitrotoluene	N.D.	330	ug/kg
Diethylphthalate	N.D.	330	ug/kg
4-Chlorophenyl-phenyl ether	N.D.	330	ug/kg
Fluorene	N.D.	330	ug/kg
4-Nitroaniline	N.D.	1600	ug/kg
4,6-Dinitro-2-methylphenol	N.D.	1600	ug/kg
N-nitrosodiphenylamine	N.D.	330	ug/kg
4-Bromophenyl-phenylether	N.D.	330	ug/kg
Hexachlorobenzene	N.D.	330	ug/kg
Pentachlorophenol	N.D.	1600	ug/kg
Phenanthrene	N.D.	330	ug/kg
Anthracene	N.D.	330	ug/kg
Di-n-Butylphthalate	N.D.	330	ug/kg
Fluoranthene	N.D.	330	ug/kg
Pyrene	N.D.	330	ug/kg
Butylbenzylphthalate	N.D.	330	ug/kg
3,3'-Dichlorobenzidine	N.D.	660	ug/kg
Benzo(a)anthracene	N.D.	330	ug/kg
Chrysene	N.D.	330	ug/kg
bis(2-Ethylhexyl)phthalate	N.D.	330	ug/kg
Di-n-octylphthalate	N.D.	330	ug/kg
Benzo(b)fluoranthene	N.D.	330	ug/kg
Benzo(k)fluoranthene	N.D.	330	ug/kg
Benzo(a)pyrene	N.D.	330	ug/kg
Indeno(1,2,3-cd)pyrene	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC - FDX (TFE1)
CTL 3310-4 Semi-Volatiles
Page 3

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Dibenz(a,h)anthracene	N.D.	330	ug/kg
Benzo(g,h,i)perylene	N.D.	330	ug/kg

OTHER CONSTITUENTS FOUND
None

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
2-Fluorophenol (Surrogate Spike)	38%
Phenol-D5 (Surrogate Spike)	66%
Nitrobenzene-D5 (Surrogate Spike)	44%
2-Fluorobiphenyl (Surrogat Spike)	116%
2,4,6-Tribromophenol (Surrogate Spike)	74%
P-Terphenyl-D14 (Surrogate Spike)	34%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

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503-382-6432

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-5
SAMPLE DESCRIP.: BH-3 18'
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER:
COLLECTED BY: EPA

ethene = see ethylene

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	N.D.	5	ug/kg
Acetone	83	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	N.D.	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	17	5	ug/kg

found in travel blank
b
chemicals
P at solvent
clean & dry metal

pg 787

tetrachloroethylene = perchloroethylene (PCE)

dry cleaning solvent, vapor-degreasing solvent, drying agent

Petroleum

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CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg

OTHER CONSTITUENTS FOUND		
Cyclohexane	1900	ug/kg
Methyl Cyclopentane	1900	ug/kg
Methyl Cyclohexane	21,000	ug/kg
Trimethyl Cyclopentane	9,300	ug/kg
Unknown Alkane	9,600	ug/kg
Dimethyl Cyclohexane	6,200	ug/kg
Dimethylcyclohexane	27,000	ug/kg
Trimethylcyclohexane	54,000	ug/kg
Methylheptanol	11,200	ug/kg
Unknown	42,000	ug/kg
Cyclododecane	18,000	ug/kg
Unknown Alkane	34,000	ug/kg
Dibutyl Cyclopentane	66,000	ug/kg
Unknown	22,000	ug/kg

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	84%
Toluene-D8	84%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. MRZ

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Mel Tuttle for JHT

John H. Tillman, R.E.A.
Manager Analytical Services

Century Testing Laboratories, Inc.

Mail: Post Office Box 1[illegible]
Bend, Oregon 9770[illegible]
503-382-6432

LABORATORY ANALYSIS

SEMI-VOLATILES - SOIL

CWEC - PDX
(TFEI)

ANALYSIS METHOD NO.: EPA 625/8270
LAB SAMPLE NO.: 3310-5
SAMPLE DESCRIP.: BH-3-18'
DATE REPORTED: 02/24/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 3/1/89
P.O. NUMBER: 4008200101
COLLECTED BY: Client

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Phenol	N.D.	330	ug/kg
Aniline	N.D.	330	ug/kg
bis(2-Chloroethyl)ether	N.D.	330	ug/kg
2-Chlorophenol	N.D.	330	ug/kg
1,3-Dichlorobenzene	N.D.	330	ug/kg
1,4-Dichlorobenzene	N.D.	330	ug/kg
Benzyl alcohol	N.D.	330	ug/kg
1,2-Dichlorobenzene	N.D.	330	ug/kg
2-Methylphenol	N.D.	330	ug/kg
bis(2-Chloroisopropyl)ether	N.D.	330	ug/kg
4-Methylphenol	N.D.	330	ug/kg
N-Nitroso-di-n-propylamine	N.D.	330	ug/kg
Hexachloroethane	N.D.	330	ug/kg
Nitrobenzene	N.D.	330	ug/kg
Isophorone	N.D.	330	ug/kg
2-Nitrophenol	N.D.	330	ug/kg
2,4-Dimethylphenol	N.D.	330	ug/kg
Benzoic acid	N.D.	1600	ug/kg
bis(2-Chloroethoxy)methane	N.D.	330	ug/kg
k2,4-Dichlorophenol	N.D.	330	ug/kg
1,2,4-Trichlorobenzene	N.D	330	ug/kg
Naphthalene	N.D.	330	ug/kg
4-Chloroaniline	N.D.	330	ug/kg
Hexachlorobutadiene	N.D.	330	ug/kg
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC-PDX (TFEI)
CTL 3310-5
Semi-Volatiles
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CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
2-Methylnaphthalene	N.D.	330	ug/kg
Hexachlorocyclopentadiene	N.D.	330	ug/kg
2,4,6-Trichlorophenol	N.D.	330	ug/kg
2,4,5-Trichlorophenol	N.D.	1600	ug/kg
2-Chloronaphthalene	N.D.	330	ug/kg
2-Nitroaniline	N.D.	1600	ug/kg
Dimethylphthalate	N.D.	330	ug/kg
Acenaphthylene	N.D.	330	ug/kg
2,6-Dinitrotoluene	N.D.	330	ug/kg
3-Nitroaniline	N.D.	1600	ug/kg
Acenaphthene	N.D.	330	ug/kg
2,4-Dinitrophenol	N.D.	1600	ug/kg
4-Nitrophenol	N.D.	1600	ug/kg
Dibenzofuran	N.D.	330	ug/kg
2,4-Dinitrotoluene	N.D.	330	ug/kg
Diethylphthalate	N.D.	330	ug/kg
4-Chlorophenyl-phenyl ether	N.D.	330	ug/kg
Fluorene	N.D.	330	ug/kg
4-Nitroaniline	N.D.	1600	ug/kg
4,6-Dinitro-2-methylphenol	N.D.	1600	ug/kg
N-nitrosodiphenylamine	N.D.	330	ug/kg
4-Bromophenyl-phenylether	N.D.	330	ug/kg
Hexachlorobenzene	N.D.	330	ug/kg
Pentachlorophenol	N.D.	1600	ug/kg
Phenanthrene	N.D.	330	ug/kg
Anthracene	N.D.	330	ug/kg
Di-n-Butylphthalate	N.D.	330	ug/kg
Fluoranthene	N.D.	330	ug/kg
Pyrene	N.D.	330	ug/kg
Butylbenzylphthalate	N.D.	330	ug/kg
3,3'-Dichlorobenzidine	N.D.	660	ug/kg
Benzo(a)anthracene	N.D.	330	ug/kg
Chrysene	N.D.	330	ug/kg
bis(2-Ethylhexyl)phthalate	N.D.	330	ug/kg
Di-n-octylphthalate	N.D.	330	ug/kg
Benzo(b)fluoranthene	N.D.	330	ug/kg
Benzo(k)fluoranthene	N.D.	330	ug/kg
Benzo(a)pyrene	N.D.	330	ug/kg
Indeno(1,2,3-cd)pyrene	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC - PDX (TFEI)
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Page 3

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Dibenz(a,h)anthracene	N.D.	330	ug/kg
Benzo(g,h,i)perylene	N.D.	330	ug/kg

OTHER CONSTITUENTS FOUND		
8 ALKANE PEAKS	550,000	ug/kg

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
2-Fluorophenol (Surrogate Spike)	Too dilute
Phenol-D5 (Surrogate Spike)	"
Nitrobenzene-D5 (Surrogate Spike)	"
2-Fluorobiphenyl (Surrogat Spike)	"
2,4,6-Tribromophenol (Surrogate Spike)	"
P-Terphenyl-D14 (Surrogate Spike)	"

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

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503-382-6432

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-6
SAMPLE DESCRIP.: BH-4 12'
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER:
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	N.D.	5	ug/kg
Acetone	N.D.	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	1	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

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CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg

OTHER CONSTITUENTS FOUND
#

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	80%
Toluene-D8	84%
Bromofluorobenzene	86%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. MRJ

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Mel / Tillman for JHT
John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

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503-382-6432

LABORATORY ANALYSIS

SEMI-VOLATILES - SOIL

CWEC - PDX
(TFEI)

ANALYSIS METHOD NO.:	EPA 625/8270
LAB SAMPLE NO.:	3310-6
SAMPLE DESCRIP.:	BH-4-12'
DATE REPORTED:	02/24/89
DATE SUBMITTED:	2/1/89
DISCARD DATE:	3/1/89
P.O. NUMBER:	4008200101
COLLECTED BY:	Client

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Phenol	N.D.	330	ug/kg
Aniline	N.D.	330	ug/kg
bis(2-Chloroethyl)ether	N.D.	330	ug/kg
2-Chlorophenol	N.D.	330	ug/kg
1,3-Dichlorobenzene	N.D.	330	ug/kg
1,4-Dichlorobenzene	N.D.	330	ug/kg
Benzyl alcohol	N.D.	330	ug/kg
1,2-Dichlorobenzene	N.D.	330	ug/kg
2-Methylphenol	N.D.	330	ug/kg
bis(2-Chloroisopropyl)ether	N.D.	330	ug/kg
4-Methylphenol	N.D.	330	ug/kg
N-Nitroso-di-n-propylamine	N.D.	330	ug/kg
Hexachloroethane	N.D.	330	ug/kg
Nitrobenzene	N.D.	330	ug/kg
Isophorone	N.D.	330	ug/kg
2-Nitrophenol	N.D.	330	ug/kg
2,4-Dimethylphenol	N.D.	330	ug/kg
Benzoic acid	N.D.	1600	ug/kg
bis(2-Chloroethoxy)methane	N.D.	330	ug/kg
k2,4-Dichlorophenol	N.D.	330	ug/kg
1,2,4-Trichlorobenzene	N.D	330	ug/kg
Naphthalene	N.D.	330	ug/kg
4-Chloroaniline	N.D.	330	ug/kg
Hexachlorobutadiene	N.D.	330	ug/kg
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC - PDX (TFEI)
CTL 3310-6 Semi-Volatiles
Page 3

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Dibenz(a,h)anthracene	N.D.	330	ug/kg
Benzo(g,h,i)perylene	N.D.	330	ug/kg

OTHER CONSTITUENTS FOUND
None

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
2-Fluorophenol (Surrogate Spike)	28%
Phenol-D5 (Surrogate Spike)	48%
Nitrobenzene-D5 (Surrogate Spike)	20%
2-Fluorobiphenyl (Surrogat Spike)	108%
2,4,6-Tribromophenol (Surrogate Spike)	64%
P-Terphenyl-D14 (Surrogate Spike)	102%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-7
SAMPLE DESCRIP.: BH-4 18'
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER:
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	12,000	5	ug/kg
Acetone	N.D.	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	31,000	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

Part - removers solvent degreaser

CH_2Cl_2 677

Fluorocarbon refrig. coolants

solvent analy. chem fumigant insecticides

Contam travel blank 9 ppb

Clorinade Samples

Methylene Chloride

Affinity for soil over water

Cyclonated hydrocarbon

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CWEC-PDX (TFEI)
CTL 3310-6 Semi-Volatiles
Page 2

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
2-Methylnaphthalene	N.D.	330	ug/kg
Hexachlorocyclopentadiene	N.D.	330	ug/kg
2,4,6-Trichlorophenol	N.D.	330	ug/kg
2,4,5-Trichlorophenol	N.D.	1600	ug/kg
2-Chloronaphthalene	N.D.	330	ug/kg
2-Nitroaniline	N.D.	1600	ug/kg
Dimethylphthalate	N.D.	330	ug/kg
Acenaphthylene	N.D.	330	ug/kg
2,6-Dinitrotoluene	N.D.	330	ug/kg
3-Nitroaniline	N.D.	1600	ug/kg
Acenaphthene	N.D.	330	ug/kg
2,4-Dinitrophenol	N.D.	1600	ug/kg
4-Nitrophenol	N.D.	1600	ug/kg
Dibenzofuran	N.D.	330	ug/kg
2,4-Dinitrotoluene	N.D.	330	ug/kg
Diethylphthalate	N.D.	330	ug/kg
4-Chlorophenyl-phenyl ether	N.D.	330	ug/kg
Fluorene	N.D.	330	ug/kg
4-Nitroaniline	N.D.	1600	ug/kg
4,6-Dinitro-2-methylphenol	N.D.	1600	ug/kg
N-nitrosodiphenylamine	N.D.	330	ug/kg
4-Bromophenyl-phenylether	N.D.	330	ug/kg
Hexachlorobenzene	N.D.	330	ug/kg
Pentachlorophenol	N.D.	1600	ug/kg
Phenanthrene	N.D.	330	ug/kg
Anthracene	N.D.	330	ug/kg
Di-n-Butylphthalate	N.D.	330	ug/kg
Fluoranthene	N.D.	330	ug/kg
Pyrene	N.D.	330	ug/kg
Butylbenzylphthalate	N.D.	330	ug/kg
3,3'-Dichlorobenzidine	N.D.	660	ug/kg
Benzo(a)anthracene	N.D.	330	ug/kg
Chrysene	N.D.	330	ug/kg
bis(2-Ethylhexyl)phthalate	N.D.	330	ug/kg
Di-n-octylphthalate	N.D.	330	ug/kg
Benzo(b)fluoranthene	N.D.	330	ug/kg
Benzo(k)fluoranthene	N.D.	330	ug/kg
Benzo(a)pyrene	N.D.	330	ug/kg
Indeno(1,2,3-cd)pyrene	N.D.	330	ug/kg

*N.D. means "not detected."

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CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg
OTHER CONSTITUENTS FOUND			
2-Methylbutyl Cyclopentane	34,000		ug/kg
Unknown Alkane	22,000		ug/kg
Cyclododecane	47,000		ug/kg
Unknown Alkane	14,000		ug/kg

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	110%
Toluene-D8	108%
Bromofluorobenzene	114%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. JMR

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Jmr for JHT

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

SEMI-VOLATILES - SOIL

CWEC - PDX
(TFEI)

ANALYSIS METHOD NO.:	EPA 625/8270
LAB SAMPLE NO.:	3310-7
SAMPLE DESCRIP.:	BH-4-18'
DATE REPORTED:	02/24/89
DATE SUBMITTED:	2/1/89
DISCARD DATE:	3/1/89
P.O. NUMBER:	4008200101
COLLECTED BY:	Client

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Phenol	N.D.	330	ug/kg
Aniline	N.D.	330	ug/kg
bis(2-Chloroethyl)ether	N.D.	330	ug/kg
2-Chlorophenol	N.D.	330	ug/kg
1,3-Dichlorobenzene	N.D.	330	ug/kg
1,4-Dichlorobenzene	N.D.	330	ug/kg
Benzyl alcohol	N.D.	330	ug/kg
1,2-Dichlorobenzene	N.D.	330	ug/kg
2-Methylphenol	N.D.	330	ug/kg
bis(2-Chloroisopropyl)ether	N.D.	330	ug/kg
4-Methylphenol	N.D.	330	ug/kg
N-Nitroso-di-n-propylamine	N.D.	330	ug/kg
Hexachloroethane	N.D.	330	ug/kg
Nitrobenzene	N.D.	330	ug/kg
Isophorone	N.D.	330	ug/kg
2-Nitrophenol	N.D.	330	ug/kg
2,4-Dimethylphenol	N.D.	330	ug/kg
Benzoic acid	N.D.	1600	ug/kg
bis(2-Chloroethoxy)methane	N.D.	330	ug/kg
k2,4-Dichlorophenol	N.D.	330	ug/kg
1,2,4-Trichlorobenzene	N.D	330	ug/kg
Naphthalene	N.D.	330	ug/kg
4-Chloroaniline	N.D.	330	ug/kg
Hexachlorobutadiene	N.D.	330	ug/kg
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC-PDX (TFEI)
CTL 3310-7 Semi-Volatiles
Page 2

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
2-Methylnaphthalene	N.D.	330	ug/kg
Hexachlorocyclopentadiene	N.D.	330	ug/kg
2,4,6-Trichlorophenol	N.D.	330	ug/kg
2,4,5-Trichlorophenol	N.D.	1600	ug/kg
2-Chloronaphthalene	N.D.	330	ug/kg
2-Nitroaniline	N.D.	1600	ug/kg
Dimethylphthalate	N.D.	330	ug/kg
Acenaphthylene	N.D.	330	ug/kg
2,6-Dinitrotoluene	N.D.	330	ug/kg
3-Nitroaniline	N.D.	1600	ug/kg
Acenaphthene	N.D.	330	ug/kg
2,4-Dinitrophenol	N.D.	1600	ug/kg
4-Nitrophenol	N.D.	1600	ug/kg
Dibenzofuran	N.D.	330	ug/kg
2,4-Dinitrotoluene	N.D.	330	ug/kg
Diethylphthalate	N.D.	330	ug/kg
4-Chlorophenyl-phenyl ether	N.D.	330	ug/kg
Fluorene	N.D.	330	ug/kg
4-Nitroaniliine	N.D.	1600	ug/kg
4,6-Dinitro-2-methylphenol	N.D.	1600	ug/kg
N-nitrosodiphenylamine	N.D.	330	ug/kg
4-Bromophenyl-phenylether	N.D.	330	ug/kg
Hexachlorobenzene	N.D.	330	ug/kg
Pentachlorophenol	N.D.	1600	ug/kg
Phenanthrene	N.D.	330	ug/kg
Anthracene	N.D.	330	ug/kg
Di-n-Butylphthalate	N.D.	330	ug/kg
Fluoranthene	N.D.	330	ug/kg
Pyrene	N.D.	330	ug/kg
Butylbenzylphthalate	N.D.	330	ug/kg
3,3'-Dichlorobenzidine	N.D.	660	ug/kg
Benzo(a)anthracene	N.D.	330	ug/kg
Chrysene	N.D.	330	ug/kg
bis(2-Ethylhexyl)phthalate	N.D.	330	ug/kg
Di-n-octylphthalate	N.D.	330	ug/kg
Benzo(b)fluoranthene	N.D.	330	ug/kg
Benzo(k)fluoranthene	N.D.	330	ug/kg
Benzo(a)pyrene	N.D.	330	ug/kg
Indeno(1,2,3-cd)pyrene	N.D.	330	ug/kg

*N.D. means "not detected."

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CWEC - PDX (TFEI)
CTL 3310-7 Semi-Volatiles
Page 3

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Dibenz(a,h)anthracene	N.D.	330	ug/kg
Benzo(g,h,i)perylene	N.D.	330	ug/kg

OTHER CONSTITUENTS FOUND
8 ALKANE PEAKS 870,000 ug/kg

The general name for paraffin or saturated hydrocarbons is alkane
Single covalent bonds
Carbon & hydrogen

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
2-Fluorophenol (Surrogate Spike)	Too dilute
Phenol-D5 (Surrogate Spike)	"
Nitrobenzene-D5 (Surrogate Spike)	"
2-Fluorobiphenyl (Surrogat Spike)	"
2,4,6-Tribromophenol (Surrogate Spike)	"
P-Terphenyl-D14 (Surrogate Spike)	"

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-3
SAMPLE DESCRIP.: BH-1 Water Sample
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER: --
COLLECTED BY: EPA

ethene (see ethylene)

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/l
Bromomethane	N.D.	10	ug/l
Vinyl Chloride	N.D.	10	ug/l
Chloroethane	N.D.	10	ug/l
Methylene Chloride	N.D.	5	ug/l
Acetone	N.D.	10	ug/l
Carbon Disulfide	N.D.	5	ug/l
1,1-Dichloroethene	N.D.	5	ug/l
1,1-Dichloroethane	N.D.	5	ug/l
1,2-Dichloroethene (total)	0.4	5	ug/l
Chloroform	N.D.	5	ug/l
1,2-Dichloroethane	N.D.	5	ug/l
2-Butanone	N.D.	10	ug/l
1,1,1-Trichloroethane	N.D.	5	ug/l
Carbon Tetrachloride	N.D.	5	ug/l
Vinyl Acetate	N.D.	10	ug/l
Bromodichloromethane	N.D.	5	ug/l
1,2-Dichloropropane	N.D.	5	ug/l
cis-1,3-Dichloropropene	N.D.	5	ug/l
Trichloroethene	N.D.	5	ug/l
Dibromochloromethane	N.D.	5	ug/l
1,1,2-Trichloroethane	N.D.	5	ug/l
Benzene	N.D.	5	ug/l
trans-1,3-Dichloropropene	N.D.	5	ug/l
Bromoform	N.D.	5	ug/l
4-Methyl-2-Pentanone	N.D.	10	ug/l
2-Hexanone	N.D.	10	ug/l
Tetrachloroethene	N.D.	5	ug/l

solvent for organics extraction acquous

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CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/l
Toluene	N.D.	5	ug/l
Chlorobenzene	N.D.	5	ug/l
Ethylbenzene	N.D.	5	ug/l
Styrene	N.D.	5	ug/l
Xylenes (Total)	N.D.	5	ug/l

OTHER CONSTITUENTS FOUND
#

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	84%
Toluene-D8	88%
Bromofluorobenzene	92%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. MRJ

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Mel J Tillman for JHT
John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

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503-382-6432

LABORATORY ANALYSIS

SEMI-VOLATILES - WATER

CWEC - PDX
(TFEI)

ANALYSIS METHOD NO.:	EPA 625/8270
LAB SAMPLE NO.:	3310-3
SAMPLE DESCRIP.:	BH-1 WATER
DATE REPORTED:	02/24/89
DATE SUBMITTED:	2/1/89
DISCARD DATE:	4/1/89
P.O. NUMBER:	4008200101
COLLECTED BY:	Client

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Phenol	N.D.	10	ug/l
Aniline	N.D.	10	ug/l
bis(2-Chloroethyl)ether	N.D.	10	ug/l
2-Chlorophenol	N.D.	10	ug/l
1,3-Dichlorobenzene	N.D.	10	ug/l
1,4-Dichlorobenzene	N.D.	10	ug/l
Benzyl alcohol	N.D.	10	ug/l
1,2-Dichlorobenzene	N.D.	10	ug/l
2-Methylphenol	N.D.	10	ug/l
bis(2-Chloroisopropyl)ether	N.D.	10	ug/l
4-Methylphenol	N.D.	10	ug/l
N-Nitroso-di-n-propylamine	N.D.	10	ug/l
Hexachloroethane	N.D.	10	ug/l
Nitrobenzene	N.D.	10	ug/l
Isophorone	N.D.	10	ug/l
2-Nitrophenol	N.D.	10	ug/l
2,4-Dimethylphenol	N.D.	10	ug/l
Benzoic acid	N.D.	50	ug/l
bis(2-Chloroethoxy)methane	N.D.	10	ug/l
2,4-Dichlorophenol	N.D.	10	ug/l
1,2,4-Trichlorobenzene	N.D	10	ug/l
Naphthalene	N.D.	10	ug/l
4-Chloroaniline	N.D.	10	ug/l
Hexachlorobutadiene	N.D.	10	ug/l
4-Chloro-3-methylphenol (para-chloro-meta-cresol)	N.D.	10	ug/l

*N.D. means "not detected."

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CWEC-PDX (TFEI)
CTL 3310-3 Semi-Volatiles
Page 2

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
2-Methylnaphthalene	N.D.	10	ug/l
Hexachlorocyclopentadiene	N.D.	10	ug/l
2,4,6-Trichlorophenol	N.D.	10	ug/l
2,4,5-Trichlorophenol	N.D.	50	ug/l
2-Chloronaphthalene	N.D.	10	ug/l
2-Nitroaniline	N.D.	50	ug/l
Dimethylphthalate pg 372	10	10	ug/l
Acenaphthylene	N.D.	10	ug/l
2,6-Dinitrotoluene	N.D.	10	ug/l
3-Nitroaniline	N.D.	50	ug/l
Acenaphthene	N.D.	10	ug/l
2,4-Dinitrophenol	N.D.	50	ug/l
4-Nitrophenol	N.D.	50	ug/l
Dibenzofuran	N.D.	10	ug/l
2,4-Dinitrotoluene	N.D.	10	ug/l
Diethylphthalate	N.D.	10	ug/l
4-Chlorophenyl-phenyl ether	N.D.	10	ug/l
Fluorene	N.D.	10	ug/l
4-Nitroanililne	N.D.	50	ug/l
4,6-Dinitro-2-methylphenol	N.D.	50	ug/l
N-nitrosodiphenylamine	N.D.	10	ug/l
4-Bromophenyl-phenylether	N.D.	10	ug/l
Hexachlorobenzene	N.D.	10	ug/l
Pentachlorophenol	N.D.	50	ug/l
Phenanthrene	N.D.	10	ug/l
Anthracene dibutyl phthalate	N.D.	10	ug/l
Di-n-Butylphthalate	158	10	ug/l
Fluoranthene	N.D.	10	ug/l
Pyrene	N.D.	10	ug/l
Butylbenzylphthalate	N.D.	10	ug/l
3,3'-Dichlorobenzidine	N.D.	20	ug/l
Benzo(a)anthracene	N.D.	10	ug/l
Chrysene	N.D.	10	ug/l
bis(2-Ethylhexyl)phthalate	N.D.	10	ug/l
Di-n-octylphthalate	N.D.	10	ug/l
Benzo(b)fluoranthene	N.D.	10	ug/l
Benzo(k)fluoranthene	N.D.	10	ug/l
Benzo(a)pyrene	N.D.	10	ug/l
Indeno(1,2,3-cd)pyrene	N.D.	10	ug/l

plasticizer for nitrocellulose & acetate resins, lacquers, lastics coating agents molding powders

plasticizer in nitrocellulose lacquers resin solvent

*N.D. means "not detected."

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CWEC-PSX (TFEI)
CTL 3301-3 Semi-Volatiles
Page 3

CONSTITUENT	SAMPLE CONC.*	DETECTION LIMIT	UNITS
Dibenz(a,h)anthracene	N.D.	10	ug/l
Benzo(g,h,i)perylene	N.D.	10	ug/l

OTHER CONSTITUENTS FOUND
None

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
2-Fluorophenol (Surrogate Spike)	4%
Phenol-D5 (Surrogate Spike)	3%
Nitrobenzene-D5 (Surrogate Spike)	96%
2-Fluorobiphenyl (Surrogat Spike)	200%
2,4,6-Tribromophenol (Surrogate Spike)	50%
P-Terphenyl-D14 (Surrogate Spike)	138%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

John H. Tillman, R.E.A.
Manager Analytical Services

JHT/jm

Century Testing Laboratories, Inc.

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LABORATORY ANALYSIS

VOLATILES

CWEC (PDX)
TFEI

ANALYSIS METHOD NO.:
LAB SAMPLE NO.: 3310-8
SAMPLE DESCRIP.: Travel Blank Water
DATE REPORTED: 02/22/89
DATE SUBMITTED: 2/1/89
DISCARD DATE: 4/1/89
P.O. NUMBER: --
COLLECTED BY: EPA

CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
Chloromethane	N.D.	10	ug/kg
Bromomethane	N.D.	10	ug/kg
Vinyl Chloride	N.D.	10	ug/kg
Chloroethane	N.D.	10	ug/kg
Methylene Chloride	N.D.	5	ug/kg
Acetone	16	10	ug/kg
Carbon Disulfide	N.D.	5	ug/kg
1,1-Dichloroethene	N.D.	5	ug/kg
1,1-Dichloroethane	N.D.	5	ug/kg
1,2-Dichloroethene (total)	N.D.	5	ug/kg
Chloroform	9	5	ug/kg
1,2-Dichloroethane	N.D.	5	ug/kg
2-Butanone	N.D.	10	ug/kg
1,1,1-Trichloroethane	N.D.	5	ug/kg
Carbon Tetrachloride	N.D.	5	ug/kg
Vinyl Acetate	N.D.	10	ug/kg
Bromodichloromethane	N.D.	5	ug/kg
1,2-Dichloropropane	N.D.	5	ug/kg
cis-1,3-Dichloropropene	N.D.	5	ug/kg
Trichloroethene	N.D.	5	ug/kg
Dibromochloromethane	N.D.	5	ug/kg
1,1,2-Trichloroethane	N.D.	5	ug/kg
Benzene	N.D.	5	ug/kg
trans-1,3-Dichloropropene	N.D.	5	ug/kg
Bromoform	N.D.	5	ug/kg
4-Methyl-2-Pentanone	N.D.	10	ug/kg
2-Hexanone	N.D.	10	ug/kg
Tetrachloroethene	N.D.	5	ug/kg

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CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	UNITS
1,1,2,2-Tetrachloroethane	N.D.	5	ug/kg
Toluene	N.D.	5	ug/kg
Chlorobenzene	N.D.	5	ug/kg
Ethylbenzene	N.D.	5	ug/kg
Styrene	N.D.	5	ug/kg
Xylenes (Total)	N.D.	5	ug/kg

OTHER CONSTITUENTS FOUND
#

COMPOUNDS ADDED FOR RECOVERY TESTING	PERCENT RECOVERY**
1,2-Dichloroethane-D4	78%
Toluene-D8	84%
Bromofluorobenzene	90%

*N.D. means "not detected."

**All Percent Recovery values were within established control limits. MRJ

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Mel J. Tillman for JHT
John H. Tillman, R.E.A.
Manager Analytical Services

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