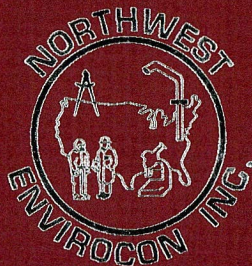


03-93-008



INDUSTRIAL HYGIENE
ENVIRONMENTAL ENGINEERING

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THIRD QUARTERLY GROUND WATER MONITORING REPORT

Delco Company (formerly Flying J)
17873 SE McLoughlin Boulevard
Milwaukie, Oregon 97267

Project Number 38-000002
(formerly 16122)

Prepared for:
Devinder Dhillon
14 Longleaf Drive
Hamilton Square, New Jersey

June 15, 1995

Prepared by:
Jeff Jackman

Northwest Envirocon, Inc.
7410 Delaware Lane
Vancouver, Washington 98664
(360) 699-4015

DEPT OF ENVIRONMENTAL QUALITY
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AUG 28 1995

NORTHWEST REGION

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1.0 INTRODUCTION

This report is to summarize the third quarterly ground water sampling event that took place on January 24, 1995 at the Milwaukie Fuel Stop/Delco facility (formerly Flying J) in Milwaukie, Oregon. This site is located at 17873 McLoughlin Boulevard, as shown in Figure 1. Ground water was sampled on January 24, 1995 from each of six (6) monitoring wells on the site. Analytical results indicated that the benzene concentration in wells MW-1, MW-2, MW-3, MW-4, and MW-5 exceeds the Oregon Cleanup Level of 5 parts per billion (ppb). The ethylbenzene concentration in MW-3 and MW-4 exceeds the Oregon Cleanup Level of 700 ppb. MW-3 and MW-4 also exceed the allowable limits of 10,000 ppb total xylenes, and 1,000 ppb toluene.

Free product was observed in MW-3 during this sampling event. Manual removal of free product from MW-3 was conducted on a weekly basis from July 19, 1994 to October 30, 1994; and biweekly from November 6, 1994 until this sampling event. Free product has not been observed in the other five (5) monitoring wells.

1.1 Objective

The purpose of this investigation was to ascertain the environmental impact of a petroleum hydrocarbon plume to the ground water at the Delco (formerly Flying J) gasoline station in Milwaukie, Oregon.

1.2 Background

In May of 1993, Delta Environmental in Bellevue, Washington conducted a Phase I Environmental Assessment of the Flying J (now Delco) gasoline station in Milwaukie, Oregon. Conclusions based on the results of the Phase I indicated the likelihood the facility may have had an unauthorized release and a Phase II preliminary site characterization was initiated. Geotech Exploration drilled five soil borings in prearranged locations within the property's boundaries. The borings did not penetrate the soil/groundwater interface. Soil samples were collected from each of the borings and analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX), total petroleum hydrocarbons (TPH) and total petroleum hydrocarbons as gasoline (TPH-G). Concentrations of BTEX and TPH were found in the soil samples in levels high enough to warrant additional drilling on the site. All five borings were subsequently abandoned with concrete after the investigation was concluded.

In June of 1993, Geotech Explorations and Delta Environmental drilled six monitoring wells on site to evaluate the potential environmental impact to ground water. According to the Delta Environmental Phase III report, the wells on the site are constructed of flush-jointed, 2-inch diameter, schedule 40 PVC pipe, fitted with 10-foot long, 0.020-inch factory slotted well screens. In each well, the screen was set at a depth which intersected the groundwater surface observed at the time of the drilling, and was surrounded by a washed silica sand filter pack to a level at least one foot above the top of the screened interval. The remaining borehole was filled with bentonite, and the well was completed with a concrete seal and a flush-mounted locking steel protective well box at the ground surface.

The results of the sampling conducted in June 1993 indicated that soils from borings MW-1 through MW-5 contained concentrations of benzene, toluene, ethylbenzene and xylenes (BTEX), total petroleum hydrocarbons (TPH) and total petroleum hydrocarbons as gasoline (TPH-G). Benzene and TPH were above Oregon Cleanup Levels in borings MW-1 through MW-5. Ground water was sampled and analyzed from each of the six wells for BTEX, TPH, and TPH-G. Laboratory analysis of the water samples obtained indicated that MW-1 through MW-5 contained concentrations of benzene and TPH which exceeded Oregon cleanup levels. MW-6 however, showed concentrations of benzene and TPH below Oregon cleanup requirements.

Since the completion of Delta Environmental Phase III in June 1993, the ground water on this site had not been sampled until July 1994 when Northwest Envirocon, Inc. was retained by Mr. Devinder Dhillon to sample the ground water from each of the six monitoring wells previously drilled by Geotech Explorations. This July, 1994 sampling event served as the first quarterly monitoring. Since that time, Northwest Envirocon has conducted second quarter ground water monitoring at this site.

2.0 GROUND WATER MONITORING ACTIVITIES

2.1. Groundwater Sampling Methods

To ensure representative ground water samples were obtained, on January 24, 1995 Northwest Envirocon field technicians purged a minimum of three well volumes from each of the monitoring wells using Voss® disposable bailers. The purged water from each well was collected and is stored in 55-gallon drums on the site until laboratory analytical results determine the proper disposal method. Static water level measurements were taken using a Slope® Water Level Indicator accurate to 0.01 feet. Water samples were collected using a separate disposable bailer for each well.

The six wells on site are fast recharging wells; and after purging, each well was allowed to recharge to at least 85 percent of its original volume prior to sampling. The ground water was then sampled using a new, pre-wrapped Voss® single sample disposable bailer and a new set of latex gloves for each well. Nylon twine was replaced between each sampling event to decrease the risk of cross-contamination. Water was discharged from a single check valve on the bottom of the bailer into two (2) 40 milliliter glass VOA vials which were supplied by Wy'East Laboratory. The samples were collected with no headspace in the vials. The water sample vials were labeled and stored in a cooler with ice packs and transported to Wy'East Laboratory in Portland with the appropriate chain-of-custody. All six wells were analyzed for EPA method 8020 (BTEX). Copies of the chain-of-custody and laboratory results are contained in Appendix C.

Static water level measurements were recorded at each well with a Slope® Water Level Indicator. The levels obtained from each well are indicated below.

Groundwater Elevations

<u>Monitoring Well</u>	<u>Depth to ground water</u>	<u>Elevation of Well</u>
MW-1	3.97 feet	99.67 feet
MW-2	2.97 feet	98.79 feet
MW-3	2.89 feet	98.57 feet
MW-4	3.56 feet	99.30 feet
MW-5	4.94 feet	100.66 feet
MW-6	4.75 feet	100.29 feet

Based on the ground water measurements, the ground water gradient for the third quarter is virtually flat. A groundwater contour map is contained in Appendix B.

2.2 Ground Water Analysis and Results

Northwest Envirocon conducted the third quarterly ground water sampling on January 24, 1995. A total of twelve 40-milliliter VOA vials (two from each well) were analyzed by Wy'East Laboratory for BTEX. The results were compared to the Oregon UST Cleanup Levels [340-122-242(4)]. Laboratory analysis revealed that five of six monitoring wells exceed the Oregon cleanup level of 5 parts per billion (ppb) benzene. Also, two wells exceed the 1,000 ppb cleanup level for toluene, the cleanup level of 10,000 ppb xylenes, and the cleanup level of 700 ppb ethylbenzene. The charts below show the laboratory results relative to Oregon Cleanup levels.

Oregon Cleanup Levels [340-122-242(4)]

<u>Benzene</u>	<u>Toluene</u>	<u>Ethylbenzene</u>	<u>Xylenes</u>
5 ppb	1,000 ppb	700 ppb	10,000 ppb

Laboratory Analytical Results for BTEX

MW-1	62 ppb*	29 ppb	349 ppb	315 ppb
MW-2	108 ppb*	ND	6 ppb	8 ppb
MW-3	19900 ppb*	21200 ppb*	6170 ppb*	31500 ppb*
MW-4	14900 ppb*	4200 ppb*	1630 ppb*	7550 ppb
MW-5	726 ppb*	10 ppb	36 ppb	125 ppb
MW-6	ND	ND	ND	ND

* Exceeds Oregon Cleanup Levels

MW-3 to the east of the UST basin was the only well that exceeded cleanup levels for **all** BTEX constituents. In addition to MW-3, MW-4 was the only other well that exceeded cleanup levels for more than one constituent (benzene, toluene and ethylbenzene). The overall BTEX concentration in, MW-2, MW-3, MW-4, and MW-5 increased considerably in comparison with the second quarterly sampling event; while the overall BTEX concentration in MW-1 decreased. BTEX concentrations in MW-6 remained the same (non-detect). A copy of the laboratory results and chain-of-custody can be found in Appendix C.

3.0 FREE PRODUCT RECOVERY

Free product was observed in MW-3 during this sampling event. Manual removal of free product from MW-3 was conducted on a weekly basis from July 19, 1994 to October 30, 1994; and biweekly from November 6, 1994 until this sampling event. Free product has not been observed in the other five (5) monitoring wells. A copy of the Free Product Recovery Chart can be found in Appendix E.

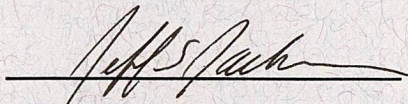
4.0 CONCLUSIONS AND RECOMMENDATIONS

The results of this sampling event indicate an overall increase in BTEX concentration in MW-2, MW-3, MW-4 and MW-5, and an overall decrease in MW-1 since the last sampling event in October, 1994. MW-3 and MW-4 (closest to the UST basin) were the only two wells to exceed Oregon cleanup levels for more than one constituent. Since five of six monitoring wells on the site detected benzene above Oregon cleanup levels, we recommend the installation of a groundwater cleanup system.

5.0 LIMITATIONS

This assessment has been performed in accordance with generally accepted environmental practices and procedures, as of the date of the report. All services have been performed employing that degree of care and skill ordinarily exercised under similar circumstances by reputable environmental technologists practicing in this, or similar localities. No other warranty or guarantee, expressed or implied, is made or offered.

The conclusions and recommendations stated in this report are based upon observations made by employees of Northwest Envirocon, Inc. and also upon information provided by others. We have no reason to suspect or believe that the information provided is inaccurate. However, we cannot be held responsible for the accuracy of the information provided to us by others.



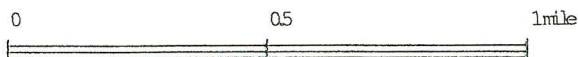
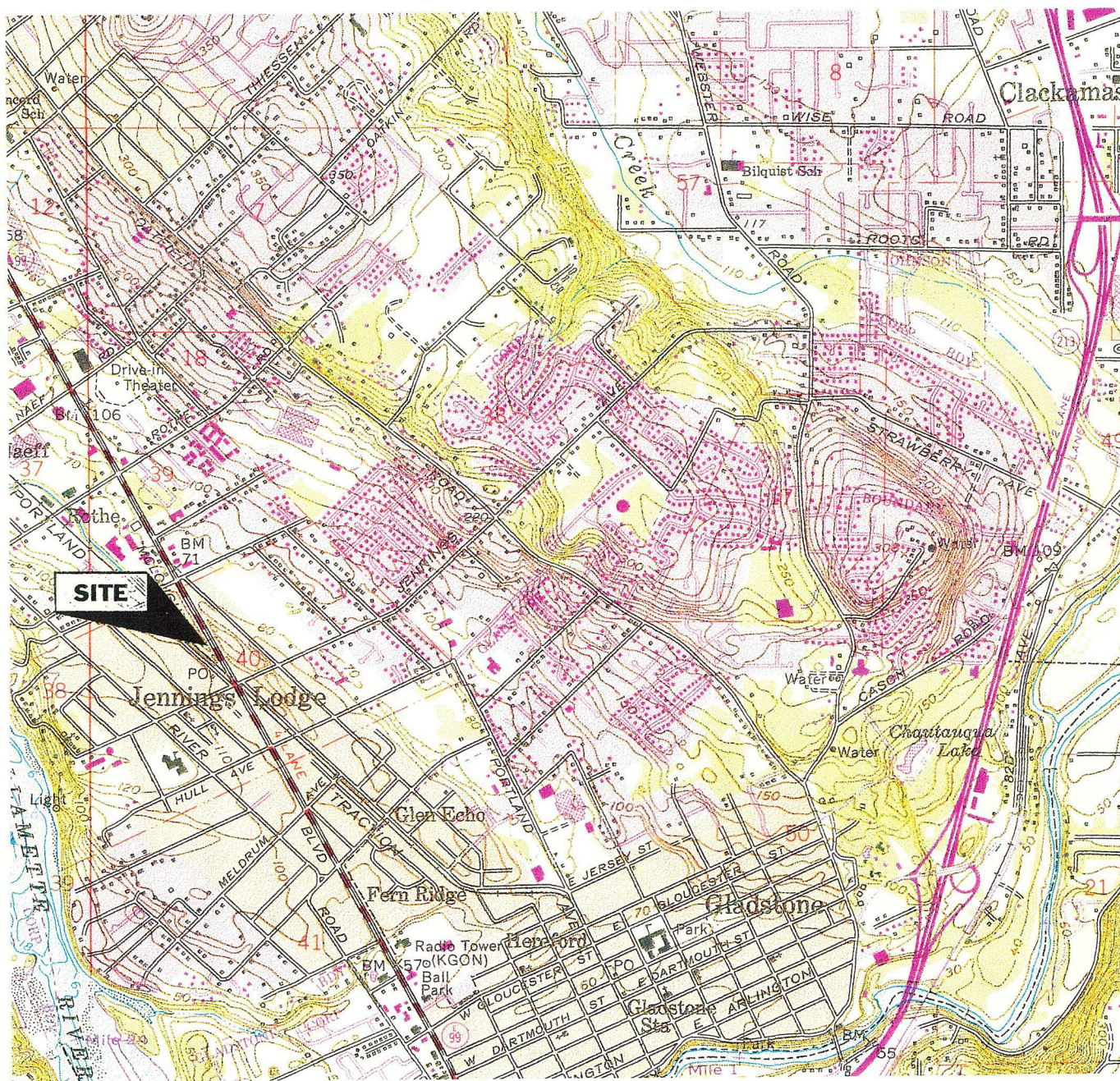
Jeff Jackman
Senior Environmental Assessor

Stan Schoof
Account Executive

6.0 APPENDICES

- A. • Topographic Map
- B. • Ground Water Contour Map
- C. • Laboratory Results and Chain of Custody
- D. • Ground Water Elevation Summary
- E. • Free Product Recovery Chart

Appendix A



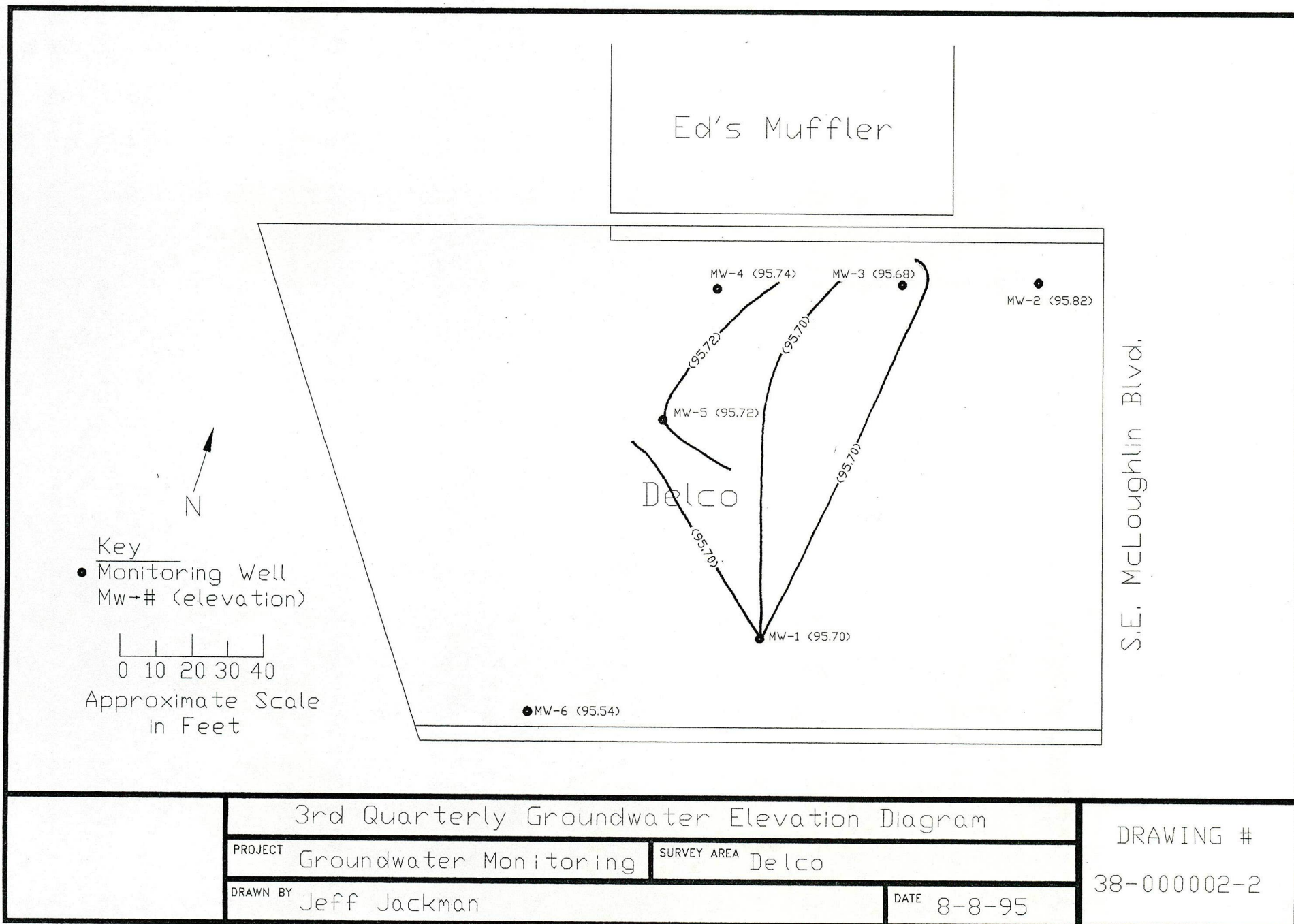
Northwest Envirocon, Inc.
Environmental Consulting

USGS 1:24,000 Topographic Map
Gladstone, Oregon Quadrangle

JOB NUMBER
38-000002

DATE
January 24, 1995

Appendix B



Appendix C

LABORATORY REPORT

Northwest Envirocon
7410 Deleware Lane
Vancouver WA 98664

PROJECT NAME/SITE: Delco
PROJECT NUMBER: 16122
EXTRACTION DATE: 2/2/95

REPORT NUMBER: 14089
REPORT DATE: 2/3/95
PAGES: 1

EPA 8020

Analyte: BTEX for water (Benzene, Toluene, Ethylbenzene, Xylenes)

Field ID	Lab ID	Identification & Quantification $\mu\text{g/L}$ (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
MW-1	18446	62	29	349	315	100
MW-2	18447	108	ND	6	8	100
MW-3	18448	19,900	21,200	6,170	31,500	101
MW-4	18449	14,900	4,200	1,630	7,550	87
MW-5	18450	726	10	36	125	105
MW-6	18451	ND	ND	ND	ND	90
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene

ND = Not Detected (below reporting limit or detection limit)

Wy'East

Environmental Sciences, Inc.

Research, Laboratory, and Consulting Services

CHAIN OF CUSTODY

2415 SE 11th Ave. • Portland, Oregon 97214 • (503) 231-9320 • FAX (503) 231-9344

PROJECT # 16122	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # 16122
COMPANY NW Envirocon	REPORT ATTENTION Laure Brown	PHONE NUMBER 206-699-4015	FAX NUMBER 206-699-5223
SAMPLES COLLECTED BY L. Brown / J. Jackson	DATE COLLECTED 1/31/95	TIME COLLECTED 11:00 - 3:00	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			

FIELD ID	MEDIA	CONTAINER	VOLUME ETC.	ANALYSIS REQUIRED	LAB ID
MW-1	water	2/VOA	40 ml ea.	BTEX	18446
MW-2	"	"	"	"	18447
MW-3	"	"	"	"	18448
MW-4	"	"	"	"	18449
MW-5	"	"	"	"	18450
MW-6	"	"	"	"	18451

RELINQUISHED BY Laure Brown	DATE / TIME 1-31-95 3pm	RECEIVED BY [Signature]	DATE / TIME 1-31-95 3:00pm
RELINQUISHED BY	DATE / TIME	RECEIVED BY LAB	DATE / TIME
REMARKS		SHIPPED BY	

Wy'East will return white copy to client with laboratory report and keep yellow copy for files. Client keeps pink copy.

Appendix D

Ground Water Elevation Summary

January 24, 1995

Well #	Top of riser elevation	measured depth to ground water (in feet)	Product layer	Ground water elevation
MW-1	99.67	3.97	none	95.70
MW-2	98.79	2.97	none	95.82
MW-3	98.57	2.89	residue	95.68
MW-4	99.30	3.56	none	95.74
MW-5	100.66	4.94	none	95.72
MW-6	100.29	4.75	none	95.54

Appendix E

FREE PRODUCT RECOVERY CHART

[illegible]

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HYGIENE

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MANAGEMENT

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