NORTHWEST ENVIROCON, INC.

INDUSTRIAL HYGIENE
ENVIRONMENTAL ENGINEERING
CONSTRUCTION SERVICES

Offices Nationwide

FIRST QUARTER 1998
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

February 12 1998

Prepared by:
Jeff Jackman

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

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1.0 INTRODUCTION

This report is to summarize the ground water sampling event FOR THE FIRST QUARTER OF 1998 that took place on January 27, 1998 at the Milwaukie Fuel Stop/Delco facility (formerly Flying J) in Milwaukie, Oregon. This site is located at 17873 McLoughlin Boulevard, as shown in Appendix A of this report. On January 27, 1998; ground water was sampled from each of the twelve (12) monitoring wells on the site. Analytical results indicated that the benzene concentration exceeds the Oregon Cleanup Level of 5 parts per billion (ppb) in wells MW-1, MW-2, MW-4, MW-5, MW-7, and MW-8. The maximum allowable levels of toluene, ethylbenzene, and xylenes were not exceeded in any of the wells during this sampling event.

No free product was observed in any of the wells during this sampling event.

1.1 Objective

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

1.2 Background

In May of 1993, Delta Environmental of 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 that 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 the 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 continued to conduct quarterly ground water monitoring at this site.

On January 27,1995 three (3) new monitoring wells were installed by Tankliners. These wells were designated MW-7, MW-8, and MW-9. MW-7 and MW-8 are four inches in diameter and were installed to accommodate a groundwater treatment system. MW-9 is a two-inch diameter well to be used for ground water monitoring, and was installed hydrologically up-gradient as recommended by the Oregon Department of Environmental Quality. Please refer to the ground water contour map in Appendix B for well locations.

MW-7 and MW-8 are constructed of flush-jointed, 4-inch diameter, schedule 40 PVC pipe, fitted with 15-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. MW-9 is of the same construction except that the diameter is 2" and the screened interval is 10 feet.

On February 20, 1995 (after the third quarter monitoring) MW-3 was decommissioned by Geotech Explorations due to repairs to the asphalt in the vicinity of the well.

The soil which had been stockpiled on the site from earlier tank removal activities was removed from the site and disposed at Roosevelt Regional Landfill in Roosevelt, Washington on March 22, 1995.

A ground water remediation system was installed on site and has been operating since September 6, 1995. The system was manufactured by Environmental Products Northwest and is operating under National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit #1500A. A copy of this permit, as well as specifications for the treatment system are included in Appendix F.

On August 12,1996 four (4) new monitoring wells were installed by Environmental West Exploration, Inc. These wells were designated MW-10, MW-11, MW-12, and MW-13. All of these are two-inch diameter wells. Initial sampling was conducted on September 17 and September 18, 1996 after development of the wells had been completed. These samples were analyzed for Total Petroleum Hydrocarbons as gasoline (EPA Method TPH-G) and for Benzene, Toluene, Ethylbenzene, and Xylenes (EPA Method 602) by On-Site Environmental, Inc. of Redmond, Washington. No contamination was detected by the laboratory in any of these initial samples. Please refer to the ground water contour map in Appendix B for well locations.

MW-10, MW-11, MW-12, and MW-13 are constructed of flush-jointed, 2-inch diameter, schedule 40 PVC pipe, fitted with 5-foot long, 0.010-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.

Discharge samples have been collected as per requirements outlined in the NPDES Permit. No BTEX contamination was detected in any of these discharge samples. A table and laboratory records pertaining to these samples are included in Appendix E.

2.0 GROUND WATER MONITORING ACTIVITIES

2.1. Groundwater Sampling Methods

To ensure representative ground water samples were obtained, on January 27, 1998 Northwest Envirocon field technicians purged a minimum of three well volumes from each of the monitoring wells. Voss® disposable bailers were used for the purging of all wells except MW-7 and MW-8. Valves installed as part of the treatment system were used to purge wells MW-7 and MW-8. The purged water from each well was collected and is stored in 55-gallon drums on the site for future disposal. Static water level measurements were taken using a Solinist® Water Level Indicator accurate to 0.01 feet. Since the intake pumps and associated control equipment for the above-mentioned treatment system are located in wells MW-7 and MW-8, it is not possible to obtain an accurate measurement of the static water level in these wells with the Solinist® Water Level Indicator. Therefore, ground water gradient calculations were performed without measurements from these two wells.

The twelve 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. Sampling methodology is as follows:

MW-1, MW-2, MW-4, MW-5, MW-6, MW-9, MW-10, MW-11, MW-12 and MW-13: The ground water was 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.

MW-7 and MW-8: Ground water samples were collected through permanently installed valves in the treatment system.

In the case of all twelve wells, water was discharged into two 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 twelve samples were analyzed using EPA method 8020 (BTEX). Copies of the chain-of-custody and laboratory results are contained in Appendix C.

Static water level measurements were recorded for wells MW-1, MW-2, MW-4, MW-5, MW-6, MW-9, MW-10, MW-11, MW-12 and MW-13. The levels obtained from each well are indicated on the following page.

Groundwater Elevations

Monitoring Well	Depth to ground water	Elevation of Well
MW-1	4.51 feet	99.67 feet
MW-2	3.75 feet	98.79 feet
MW-4	4.26 feet	99.30 feet
MW-5	5.62 feet	100.66 feet
MW-6	5.01 feet	100.29 feet
MW-9	4.91 feet	99.72 feet
MW-10	3.61 feet	98.77 feet
MW-11	5.66 feet	99.98 feet
MW-12	4.96 feet	100.54 feet
MW-13	4.86 feet	100.11 feet

Based on the ground water measurements, the ground water flow gradient at the time of this sampling event sloped downward primarily to the north. A groundwater contour map is contained in the Appendices.

2.2 Ground Water Analysis and Results

Northwest Envirocon conducted the first quarterly ground water sampling event for 1998 on January 27. A total of twenty-four 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 six of the twelve monitoring wells exceeded the Oregon cleanup level of 5 parts per billion (ppb) benzene, and none of the wells exceeded the Oregon cleanup levels for toluene, ethylbenzene, or xylenes. The following charts show the laboratory results relative to Oregon Cleanup levels.

	Oregon Cleanup Levels [340-122-242(4)]			
	Benzene	Toluene	Ethylbenzene	Xylenes
	5 ppb	1,000 ppb	700 ppb	10,000 ppb
	Laboratory Analytical Results for BTEX			
MW-1	411 ppb*	11 ppb	66 ppb	82 ppb
MW-2	34 ppb*	ND	ND	ND
MW-4	2,960 ppb*	133 ppb	513 ppb	1,070 ppb
MW-5	901 ppb*	5 ppb	17 ppb	60 ppb
MW-6	ND	ND	ND	ND
MW-7	309 ppb*	121 ppb	315 ppb	1,560 ppb
MW-8	522 ppb*	63 ppb	230 ppb	469 ppb
MW-9	ND	ND	ND	ND
MW-10	ND	ND	ND	ND
MW-11	ND	ND	ND	ND
MW-12	ND	ND	ND	ND
MW-13	ND	ND	ND	ND

* Exceeds Oregon Cleanup Levels

A copy of the laboratory results and chain-of-custody can be found in Appendix C.

3.0 FREE PRODUCT RECOVERY

No free product was observed during this ninth quarterly ground water sampling event.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The results of this sampling event indicate an overall decrease in BTEX concentration in MW-4, MW-8, and MW-9, and an overall increase in MW-1, MW-2, MW-5, and MW-7 since the previous quarterly sampling event. No BTEX constituents were detected in MW-6, MW-9, MW-10, MW-11, MW-12, or MW-13. Benzene was the only BTEX constituent in excess of Oregon cleanup levels. NWE Recommends closure of the site under RBCA guidelines introduced by DEQ OAR 340-122-250. After completion of a risk assessment, we assume that the Department will require post-compliance monitoring before issuing final closure.

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

Dennis Hudson
President

6.0 APPENDICES

A • Topographic Map

B • Ground Water Contour Map

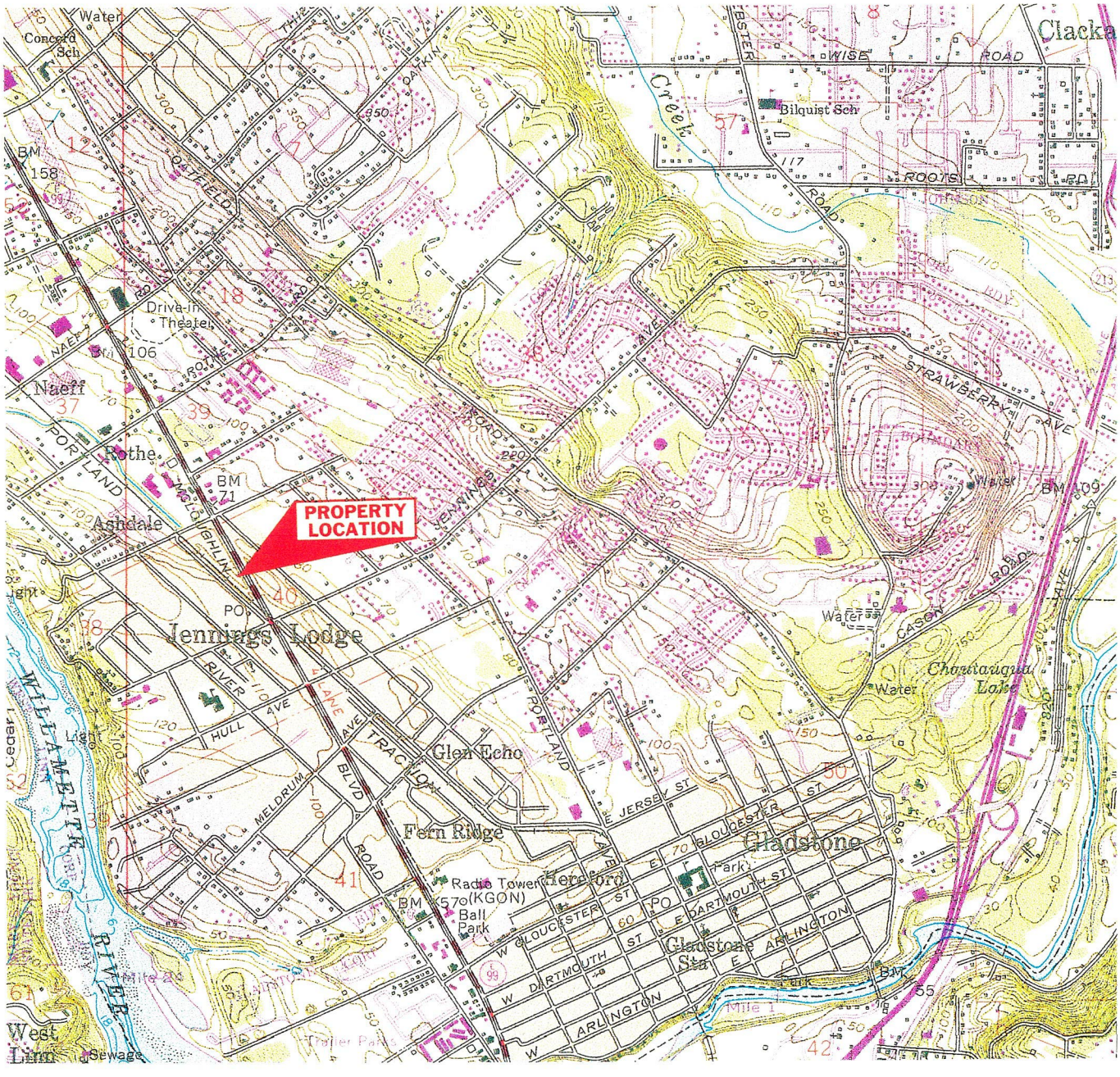
C • Laboratory Results and Chain of Custody for First Quarter 1998 Sampling Event

D • Ground Water Elevation Summary

E • Daily, Weekly, and Monthly Discharge Monitoring Records and Associated Laboratory Results and Chain of Custody

F • Treatment System Specifications and Permit

Appendix A

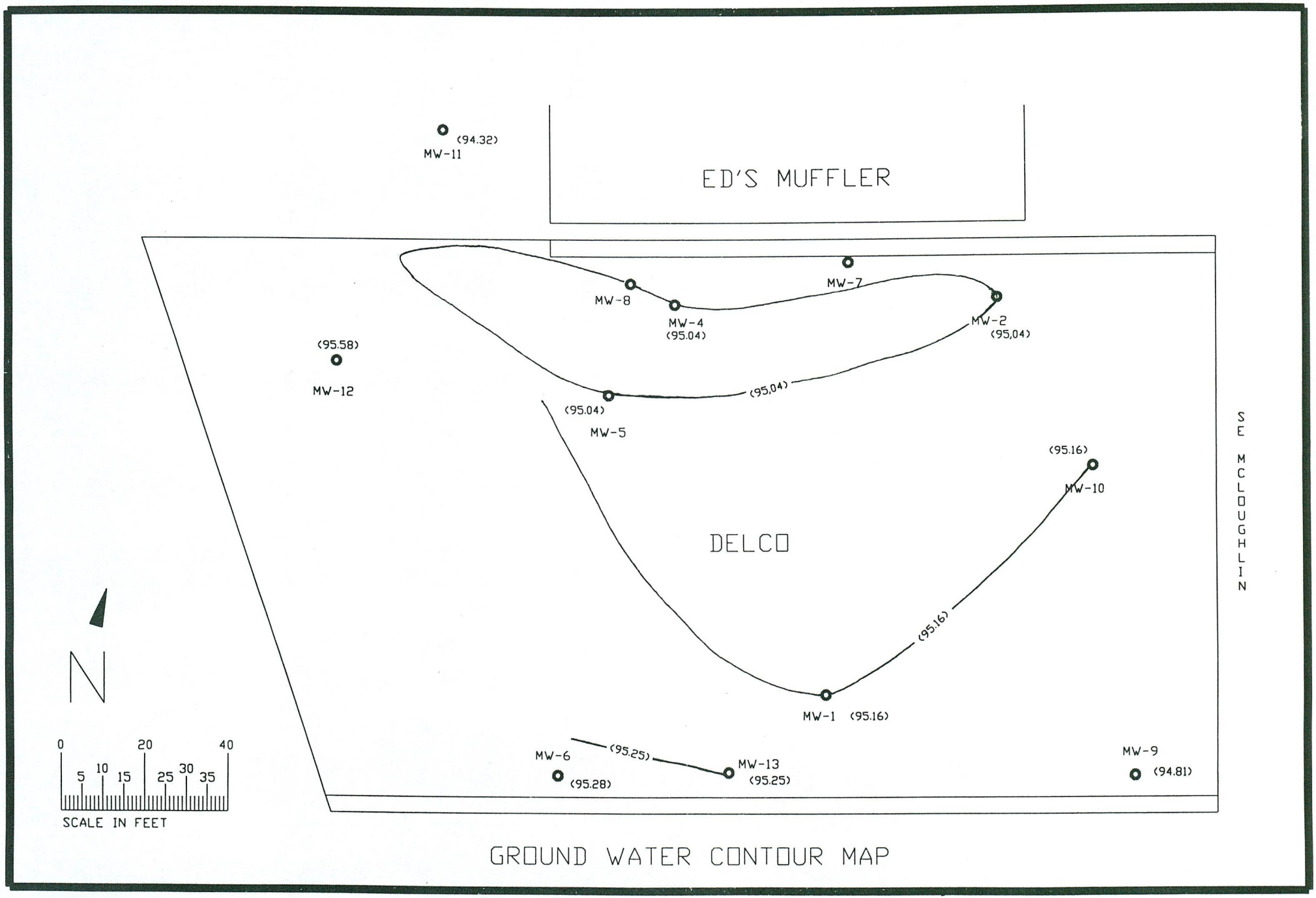


Northwest Envirocon, Inc.
Environmental Consulting

USGS 1:24,000 Topographic Map
Gladstone Quadrangle

JOB NUMBER	DATE
38-000002	January 15, 1997

Appendix B



GROUND WATER CONTOUR MAP

Appendix C

LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE: Delco
PROJECT NUMBER: 38-000002
EXTRACTION DATE: 2-1-98

REPORT NUMBER: 21168
REPORT DATE: 2-5-98
PAGES: 1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
MW-1	39044	**411**	**11**	**66**	**82**	104
MW-2	39045	**34**	**ND**	**ND**	**ND**	88
MW-4	39046	**2960**	**133**	**513**	**1070**	108
MW-5	39047	**901**	**5**	**17**	**60**	106
MW-6	39048	**ND**	**ND**	**ND**	**ND**	94
MW-7	39049	**309**	**121**	**315**	**1560**	83
MW-8	39050	**522**	**63**	**230**	**469**	98
MW-9	39051	**ND**	**ND**	**ND**	**ND**	88
MW-10	39052	**ND**	**ND**	**ND**	**ND**	86
MW-11	39053	**ND**	**ND**	**ND**	**ND**	141
MW-12	39054	**ND**	**ND**	**ND**	**ND**	139
MW-13	39055	**ND**	**ND**	**ND**	**ND**	136
DSC-0127	39056	**ND**	**ND**	**ND**	**ND**	141
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

TPH-G modified for water

Analyte: Total Petroleum Hydrocarbon Quantification

Field ID	Lab ID	µg/L (ppb)	Surrogate Recovery(%)
DSC-0127	39056	**ND**	**141**
BLANK	-	ND	-
Detection Limit	-	125	-

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

EPA 150.1 pH

Field ID	Lab ID	pH
DSC-0127	39056	**8.10**

Report Number: 21168

Wy'East
Environmental Sciences, Inc.

Research & Laboratory Services

CHAIN OF CUSTODY

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

PROJECT # 38.000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P98480-001928
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 691-5223
SAMPLES COLLECTED BY Jackman	DATE(S) COLLECTED 1/27/98	TIME(S) COLLECTED	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			Regular ☐ 3-5 Days ☐

FIELD ID	MEDIA	CONTAINER	VOLUME ETC	ANALYSIS REQUIRED	LAB ID
MW-1	water	VOA	40ml	BTEX	39044
MW-2					39045
MW-4					39046
MW-5					39047
MW-6					39048
MW-7					39049
MW-8					39050
MW-9					39051
MW-10					39052
MW-11					39053
MW-12					39054
MW-13					39055
DSC-0127				BTEX TPH-G, Pb	39056

RELINQUISHED BY	DATE / TIME 1/28/98 2:30 pm	RECEIVED BY	DATE / TIME 1-28-98 12:00 pm
RELINQUISHED BY	DATE / TIME 1-28-98 4:45	RECEIVED BY LAB	DATE / TIME 1-28-98 4:45 pm
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 15, 1997

Well #	Top of riser elevation	measured depth to ground water (in feet)	Product layer	Ground water elevation
MW-1	99.67	4.51	none	95.16
MW-2	98.79	3.75	none	95.04
MW-4	99.30	4.26	none	95.04
MW-5	100.66	5.62	none	95.04
MW-6	100.29	5.01	none	95.28
MW-9	99.72	4.91	none	94.81
MW-10	98.77	3.61	none	95.16
MW-11	99.98	5.66	none	94.32
MW-12	100.54	4.96	none	95.58
MW-13	100.11	4.86	none	95.25

Appendix E

DISCHARGE MONITORING CHART

Date/Time	BTEX	TPH-G	Ph	Flow (gal)
9-6-95/12:50	Not Sampled	Not Detected	7.99	12,600
9-7-95/12:55	Not Sampled	Not Detected	8.04	17,770
9-8-95/12:51	Not Sampled	Not Detected	8.03	22,890
9-9-95/12:40	Not Sampled	Not Detected	8.13	28,000
9-10-95/12:42	Not Sampled	Not Detected	8.35	33,850
9-20-95/12:19	Not Detected	Not Detected	8.26	87,710
9-27-95/11:41	Not Detected	Not Detected	8.23	178,570
10-5-95/13:14	Not Detected	Not Detected	8.63	221,850
10-11-95/14:19	Not Detected	Not Detected	8.55	257,810
10-19-95/13:46	Not Detected	Not Detected	8.50	294,410
10-26-95/11:39	Not Detected	Not Detected	8.50	342,545
11-10-95/13:17	Not Detected	Not Detected	8.03	409,211
11-17-95/14:22	Not Detected	Not Detected	8.40	443,550
11-24-95/11:19	Not Detected	Not Detected	8.50	476,401
11-30-95/10:51	Not Detected	Not Detected	8.36	518,990
12-08-95/11:51	Not Detected	Not Detected	8.33	577,010
12-14-95/13:53	Not Detected	Not Detected	7.34	589,720
12-22-95/11:48	Not Detected	Not Detected	6.90	626,341
12-29-95/11:20	Not Detected	Not Detected	8.38	670,450
01-05-96/11:03	Not Detected	Not Detected	8.42	711,683
01-12-96/16:15	Not Detected	Not Detected	8.40	746,880
01-19-96/17:17	Not Detected	Not Detected	8.43	784,400
01-26-96/15:37	Not Detected	Not Detected	8.29	821,511

DISCHARGE MONITORING CHART (continued)

Date/Time	BTEX	TPH-G	Ph	Flow (gal)
02-06-96/09:56	Not Detected	Not Detected	8.41	878,570
02-12-96/14:27	Not Detected	Not Detected	8.40	910,340
02-19-96/11:36	Not Detected	Not Detected	8.45	944,980
02-26-96/10:35	Not Detected	Not Detected	8.30	979,180
03-04-96/10:35	Not Detected	Not Detected	8.39	1,014,950
03-11-96/13:15	Not Detected	Not Detected	8.34	1,050,270
03-19-96/13:00	Not Detected	Not Detected	8.46	1,092,040
03-25-96/13:30	Not Detected	Not Detected	8.34	1,113,980
04-01-96/12:05	Not Detected	Not Detected	8.40	1,143,750
05-13-96/15:23	Not Detected	Not Detected	8.32	1,310,840
06-03-96/11:00	2ppb benzene 5ppb toluene ND ethylbenzene ND xylenes	Not Detected	8.33	1,447,230
07-03-96/13:55	Not Detected	Not Detected	8.36	1,669,080
08-06-96/12:08	Not Detected	Not Detected	8.37	1,831,380
09-19-96/09:30	Not Detected	Not Detected	8.48	1,981,210
10-18-96/13:00	Not Detected	Not Detected	7.71	2,146,600
11-11-96/10:45	Not Detected	Not Detected	8.26	2,296,590
	(Flow meter replaced 12/16/96)			
12-27-96/10:50	Not Detected	Not Detected	8.33	40,930
01-15-97/16:00	Not Detected	Not Detected	8.41	115,410
03-04-97/10:50	Not Detected	Not Detected	8.46	290,140
04-29-97/11:20	Not Detected	Not Detected	8.24	618,730
5-19-97/14:00	Not Detected	Not Detected	8.40	656,360

DISCHARGE MONITORING CHART (continued)

7-28-97/12:35	Not Detected	Not Detected	8.97	830,920
8-27-97/10:35	Not Detected	Not Detected	8.27	1,036,880
9-23-97/13:35	Not Detected	Not Detected	8.34	1,120,200
10-27-97/11:45	Not Detected	Not Detected	8.29	1,158,890
12-05-97/11:50	Not Detected	Not Detected	8.02	1,264,730
01-27-98/15:05	Not Detected	Not Detected	8.10	1,387,280
02-19-98/11:40	Not Detected	Not Detected	7.45	1,644,200

LABORATORY REPORT

Northwest Envirocon
7410 Deleware Lane
Vancouver WA 98664

PROJECT NAME/SITE:	Delco	**REPORT NUMBER:**	18360
PROJECT NUMBER:	38-000002	**REPORT DATE:**	3-6-97
EXTRACTION DATE:	3-5-97	**PAGES:**	1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC0304	31009	**ND**	**ND**	**ND**	**ND**	72
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

TPH-G modified for water

Analyte: Total Petroleum Hydrocarbon Quantification

Field ID	Lab ID	µg/L (ppb)	Surrogate Recovery(%)
DSC0304	31009	**ND**	**72**
BLANK	-	ND	-
Detection Limit	-	125	-

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

EPA 150.1 pH

Field ID	Lab ID	pH
DSC0304	31009	**8.46**

Report Number: 18360

Wy'East
Environmental Sciences, Inc.

CHAIN OF CUSTODY

MAR 10 1997
By

Research, Laboratory, and Consulting Services

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

PROJECT # 38-000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P9748000176907J
COMPANY Nute	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699 5223
SAMPLES COLLECTED BY J. Kuman	DATE COLLECTED 3/4/97	TIME COLLECTED 10:50 am	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			

FIELD ID	MEDIA	CONTAINER	VOLUME ETC.	ANALYSIS REQUIRED	LAB ID
DSC 0304	water	VOA (2)	40 ml	BTEX, TPH-G, Pb	31009

RELINQUISHED BY [signature]	DATE / TIME 3/4/97 11:10 am	RECEIVED BY	DATE / TIME
RELINQUISHED BY	DATE / TIME	RECEIVED BY LAB Jeffrey B. Rinehart	DATE / TIME 11:10 am 3-4-97
REMARKS		SHIPPED BY	

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

LABORATORY REPORT

MAY 14 1997

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE:	Delco	**REPORT NUMBER:**	18894
PROJECT NUMBER:	38-000002	**REPORT DATE:**	5-12-97
EXTRACTION DATE:	5-9-97	**PAGES:**	1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 0429	32468	**ND**	**ND**	**ND**	**ND**	73
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

TPH-G modified for water

Analyte: Total Petroleum Hydrocarbon Quantification

Field ID	Lab ID	µg/L (ppb)	Surrogate Recovery(%)
DSC0429	32468	**ND**	**73**
BLANK	-	ND	-
Detection Limit	-	125	-

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

EPA 150.1 pH

Field ID	Lab ID	pH
DSC0429	32468	**8.24**

Report Number: 18894

MAY 14 1997

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 # 58-000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P97480 1799
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699 5223
SAMPLES COLLECTED BY Jackman	DATE COLLECTED 4/29/97	TIME COLLECTED	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			

FIELD ID	MEDIA	CONTAINER	VOLUME ETC.	ANALYSIS REQUIRED	LAB ID
DSC 0429	water	VOA	40 ml	BTEX, TPH-G, Pb	32468

RELINQUISHED BY [signature]	DATE / TIME 5/9/97	RECEIVED BY	DATE / TIME
RELINQUISHED BY	DATE / TIME	RECEIVED BY LAB C.Y. Chan	DATE / TIME 5/9/97 1100 pm
REMARKS		SHIPPED BY	

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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE: Delco
PROJECT NUMBER: 38-000002
EXTRACTION DATE: 5-19-97

REPORT NUMBER: 18965
REPORT DATE: 5-20-97
PAGES: 1 of 1

TPH-G modified for water
Analyte: Total Petroleum Hydrocarbon Quantification

Field ID	Lab ID	µg/L (ppb)	Surrogate Recovery(%)
DSC 0519	32706	**ND**	**75**
BLANK	-	ND	-
Detection Limit	-	125	-

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

EPA 8020
Analyte: BTEX for water (Benzene, Toluene, Ethylbenzene, Xylenes)

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 0519	32706	**ND**	**ND**	**ND**	**ND**	75
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

EPA 150.1 pH

Field ID	Lab ID	pH
DSC 0519	32706	**8.40**

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Report Number: R18965

CHAIN OF CUSTODY

PROJECT # 38-000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # D97480000805
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER (360) 699-495	FAX NUMBER (360) 699 5223
SAMPLES COLLECTED BY Jackman	DATE(S) COLLECTED 5/19/97	TIME(S) COLLECTED 2:00pm	SAMPLES CHILLED TO 4° C? Yes
PRESERVATIVE USED? (HCl, etc.)			Regular ☐ 3-5 Days ☐

FIELD ID	MEDIA	CONTAINER	VOLUME ETC	ANALYSIS REQUIRED	LAB ID
DSC 0519	water	VOA	2x40ml	TPH-G, Ph, BTEX	32706

RELINQUISHED BY Jeff Sparks	DATE / TIME 5/19/97 2:18pm	RECEIVED BY	DATE / TIME 5-19-97 2:45pm
RELINQUISHED BY	DATE / TIME	RECEIVED BY LAB	DATE / TIME
REMARKS		SHIPPED BY	

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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE:	Delco	**REPORT NUMBER:**	19609
PROJECT NUMBER:	38-000002	**REPORT DATE:**	8-12-97
EXTRACTION DATE:	8-7-97	**PAGES:**	1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 0728	34359	**ND**	**ND**	**ND**	**ND**	81
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

OREGON TPH-G

Analyte: Total Petroleum Hydrocarbon Quantification for soil

Field ID	Lab ID	mg/Kg (ppm)	Surrogate Recovery (%)
DSC 0728	34359	**ND**	81
BLANK	-	ND	-
Reporting Limit	-	10	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

EPA 150.1 pH

Field ID	Lab ID	pH
DSC 0728	34359	**8.97**

Report Number: 19609

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PROJECT # 38-000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P97-480-7859
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699 5223
SAMPLES COLLECTED BY Jackman	DATE(S) COLLECTED 7/28/97	TIME(S) COLLECTED	SAMPLES CHILLED TO 4° C? Yes
PRESERVATIVE USED? (HCl, etc.)			Regular ☐ 3-5 Days ☐

FIELD ID	MEDIA	CONTAINER	VOLUME ETC	ANALYSIS REQUIRED	LAB ID
DSC 0728	Water	~~VOA~~ VOA(2)	40 ml	BTEX, TPH-G, Pb	34359

RELINQUISHED BY [signature] DATE / TIME 8/6/97 12:55 pm	RECEIVED BY DATE / TIME
RELINQUISHED BY DATE / TIME	RECEIVED BY LAB G. Chan 8/6/97 1:40 pm DATE / TIME
REMARKS	SHIPPED BY

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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE: Delco
PROJECT NUMBER: 38-000002
EXTRACTION DATE: 8-28-97
REPORT NUMBER: 19801
REPORT DATE: 9-8-97
PAGES: 1 of 1

OREGON TPH-G

Analyte: Total Petroleum Hydrocarbon Quantification for soil

Field ID	Lab ID	mg/Kg (ppm)	Surrogate Recovery (%)
DSC 0827	34964	**ND**	100
BLANK	-	ND	-
Reporting Limit	-	10	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 0827	34964	**ND**	**ND**	**ND**	**ND**	100
BLANK	-	ND	ND	ND	ND	
Quantification Limits	-	2	2	2	2	

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

EPA 150.1 pH

Field ID	Lab ID	pH
DSC 0827	34964	**8.27**

Report Number: 19801

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CHAIN OF CUSTODY

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

PROJECT # 38-000002	PROJECT NAME / SITE Dalco	STATE OR	PURCHASE ORDER # P3W80001869
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699-5223
SAMPLES COLLECTED BY Jackman	DATE(S) COLLECTED 8/27/97	TIME(S) COLLECTED	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			Regular ☐ 3-5 Days ☐

FIELD ID	MEDIA	CONTAINER	VOLUME ETC	ANALYSIS REQUIRED	LAB ID
DSC 0827	water	VOA(2)	40 ml	BTEX, TPH-G, Pb	34964

RELINQUISHED BY Jeff Jackman	DATE / TIME 8/27/97 2:30 pm	RECEIVED BY	DATE / TIME
RELINQUISHED BY	DATE / TIME	RECEIVED BY LAB Reza Addis	DATE / TIME 8/27/97 2:30 pm
REMARKS		SHIPPED BY	

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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE: Delco
PROJECT NUMBER: 38-000002
EXTRACTION DATE: 9-30-97

REPORT NUMBER: 20080
REPORT DATE: 10-1-97
PAGES: 1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 0923	35786	**ND**	**ND**	**ND**	**ND**	87
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

OREGON TPH-G

Analyte: Total Petroleum Hydrocarbon Quantification for soil

Field ID	Lab ID	mg/Kg (ppm)	Surrogate Recovery (%)
DSC 0923	35786	**ND**	87
BLANK	-	ND	-
Reporting Limit	-	10	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

EPA 150.1 pH

Field ID	Lab ID	pH
DSC 0923	35786	**8.34**

Report Number: ~~20079~~ 20080

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PROJECT # 38-000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P97-0018*79
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699 5223
SAMPLES COLLECTED BY Trabusmer	DATE(S) COLLECTED 9/23/97	TIME(S) COLLECTED 13:35	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			Regular ☐ 3-5 Days ☐

FIELD ID	MEDIA	CONTAINER	VOLUME ETC	ANALYSIS REQUIRED	LAB ID
DSC 0923	water	VOA	40 ml	BTEX, TPH-G, Pb	35786

RELINQUISHED BY T. Trabusmer DATE / TIME 9-23-97 16:00	RECEIVED BY Jeff S Sanborn DATE / TIME 9/23/97 17:02
RELINQUISHED BY Jeff S Sanborn DATE / TIME	RECEIVED BY LAB A. Chen 9/30/97 11:05 AM DATE / TIME
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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE:	Delco	**REPORT NUMBER:**	20325
PROJECT NUMBER:	38-000002	**REPORT DATE:**	11-3-97
EXTRACTION DATE:	10-27-97	**PAGES:**	1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 1027	36522	**ND**	**ND**	**ND**	**ND**	86
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

OREGON TPH-G

Analyte: Total Petroleum Hydrocarbon Quantification for soil

Field ID	Lab ID	mg/Kg (ppm)	Surrogate Recovery (%)
DSC 1027	36522	**ND**	86
BLANK	-	ND	-
Reporting Limit	-	10	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

EPA 150.1 pH

Field ID	Lab ID	pH
DSC 1027	36522	**8.29**

Report Number: F20325

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PROJECT # 38-000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P97480-001890
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699 5223
SAMPLES COLLECTED BY Jackman	DATE COLLECTED 10-27-97	TIME COLLECTED	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			

FIELD ID	MEDIA	CONTAINER	VOLUME ETC.	ANALYSIS REQUIRED	LAB ID
DSC 1027	Water	VOA	40ml	BTEX, TPH-G, Pb	36522

RELINQUISHED BY Jeff Jackman	DATE / TIME 10/27/97 11:20am	RECEIVED BY	DATE / TIME
RELINQUISHED BY	DATE / TIME	RECEIVED BY LAB	DATE / TIME 11:20 10/27
REMARKS		SHIPPED BY	

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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE:	Delco	**REPORT NUMBER:**	20764
PROJECT NUMBER:	38-000002	**REPORT DATE:**	12-10-97
EXTRACTION DATE:	12-8-97	**PAGES:**	1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 1205	37856	**ND**	**ND**	**ND**	**ND**	98
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

TPH-G modified for water

Analyte: Total Petroleum Hydrocarbon Quantification

Field ID	Lab ID	µg/L (ppb)	Surrogate Recovery(%)
DSC 1205	37856	**ND**	**98**
BLANK	-	ND	-
Detection Limit	-	125	-

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

EPA 150.1 pH

Field ID	Lab ID	pH
DSC 1205	37856	**8.02**

Report Number: 20764

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PROJECT # 38-000002	PROJECT NAME / SITE Dalco	STATE OR	PURCHASE ORDER # P97480-001905
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699 5223
SAMPLES COLLECTED BY Jackman	DATE COLLECTED 12/5/97	TIME COLLECTED 11:50 am	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			

FIELD ID	MEDIA	CONTAINER	VOLUME ETC.	ANALYSIS REQUIRED	LAB ID
DSC 1205	water	VOA (2)	40 ml ea.	BTEX, TPH-G, Pb	37856

RELINQUISHED BY	DATE / TIME 12/5/97 3:35 pm	RECEIVED BY	DATE / TIME 12-5-97 / 3:35pm
RELINQUISHED BY	DATE / TIME 12/6/97 5:30pm	RECEIVED BY LAB	DATE / TIME 12-5-97 5:30 PM
REMARKS		SHIPPED BY	

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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE: Delco
PROJECT NUMBER: 38-000002
EXTRACTION DATE: 2-1-98

REPORT NUMBER: 21168
REPORT DATE: 2-5-98
PAGES: 1 of 1

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
MW-1	39044	**411**	**11**	**66**	**82**	104
MW-2	39045	**34**	**ND**	**ND**	**ND**	88
MW-4	39046	**2960**	**133**	**513**	**1070**	108
MW-5	39047	**901**	**5**	**17**	**60**	106
MW-6	39048	**ND**	**ND**	**ND**	**ND**	94
MW-7	39049	**309**	**121**	**315**	**1560**	83
MW-8	39050	**522**	**63**	**230**	**469**	98
MW-9	39051	**ND**	**ND**	**ND**	**ND**	88
MW-10	39052	**ND**	**ND**	**ND**	**ND**	86
MW-11	39053	**ND**	**ND**	**ND**	**ND**	141
MW-12	39054	**ND**	**ND**	**ND**	**ND**	139
MW-13	39055	**ND**	**ND**	**ND**	**ND**	136
DSC-0127	39056	**ND**	**ND**	**ND**	**ND**	141
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

TPH-G modified for water

Analyte: Total Petroleum Hydrocarbon Quantification

Field ID	Lab ID	µg/L (ppb)	Surrogate Recovery(%)
DSC-0127	39056	**ND**	**141**
BLANK	-	ND	-
Detection Limit	-	125	-

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

EPA 150.1 pH

Field ID	Lab ID	pH
DSC-0127	39056	**8.10**

Report Number: 21168

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CHAIN OF CUSTODY

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PROJECT # 38.000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P98480-001928
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER 360 699 4015	FAX NUMBER 360 699-5223
SAMPLES COLLECTED BY Jackman	DATE(S) COLLECTED 1/27/98	TIME(S) COLLECTED	SAMPLES CHILLED TO 4° C? yes
PRESERVATIVE USED? (HCl, etc.)			Regular ☐ 3-5 Days ☐

FIELD ID	MEDIA	CONTAINER	VOLUME ETC	ANALYSIS REQUIRED	LAB ID
MW-1	Water	VOA	4/0mL	BTEX	39044
MW-2					39045
MW-4					39046
MW-5					39047
MW-6					39048
MW-7					39049
MW-8					39050
MW-9					39051
MW-10					39052
MW-11					39053
MW-12					39054
MW-13					39055
DSC-0127				BTEX TPH-G, Ph	39056

RELINQUISHED BY	DATE / TIME 1/28/98 2:30 pm	RECEIVED BY	DATE / TIME 1-28-98 12:00 pm
RELINQUISHED BY	DATE / TIME 1-28-98 4:45p	RECEIVED BY LAB	DATE / TIME 1-28-98 4:45 pm
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LABORATORY REPORT

Northwest Envirocon
7410 Delaware Lane
Vancouver WA 98664

PROJECT NAME/SITE: Delco
PROJECT NUMBER: 38-000002
EXTRACTION DATE: 2-20-98

REPORT NUMBER: 21381
REPORT DATE: 2-23-98
PAGES: 1 of 1

TPH-G modified for water

Analyte: Total Petroleum Hydrocarbon Quantification

Field ID	Lab ID	µg/L (ppb)	Surrogate Recovery(%)
DSC 0219	39658	**ND**	**81**
BLANK	-	ND	-
Detection Limit	-	125	-

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

EPA 8020

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

Field ID	Lab ID	Identification & Quantification µg/L (ppb)				Surrogate Recovery (%)
		Benzene	Toluene	Ethyl-Benzene	Xylenes	
DSC 0219	39658	**ND**	**ND**	**ND**	**ND**	81
BLANK	-	ND	ND	ND	ND	-
Quantification Limits	-	2	2	2	2	-

Surrogate is p-Bromofluorobenzene
ND = Not Detected (below reporting limit or detection limit)

EPA 150.1 pH

Field ID	Lab ID	pH
DSC 0219	39658	**7.45**

Report Number: 21381

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PROJECT # 38-000002	PROJECT NAME / SITE Delco	STATE OR	PURCHASE ORDER # P98 485-00958
COMPANY NWE	REPORT ATTENTION Jeff	PHONE NUMBER (360) 699-4015	FAX NUMBER 360 699 5223
SAMPLES COLLECTED BY Jackman	DATE(S) COLLECTED 2/19/98	TIME(S) COLLECTED 13:20	SAMPLES CHILLED TO 4° C? Yes
PRESERVATIVE USED? (HCl, etc.)			Regular ☐ 3-5 Days ☐

FIELD ID	MEDIA	CONTAINER	VOLUME ETC	ANALYSIS REQUIRED	LAB ID
DSC 0219	water	VOA	40 ml	BTEX, TPH-G, Pb	39658

RELINQUISHED BY [signature] DATE / TIME 2/19/98 13:45	RECEIVED BY DATE / TIME
RELINQUISHED BY DATE / TIME	RECEIVED BY LAB [signature] DATE / TIME 2/19/98 1:45
REMARKS	SHIPPED BY

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Appendix F

DELCO PROJECT
17873 S.E. McLoughlin BLVD
Milwualkie, Oregon

Estimate of Discharge Volumes

Flow Rate: 7,200 gallons per day
Maximum Concentrations: Benzene = 0.00004 ppm
Toluene = 0.00000007 ppm
Ethylbenzene = 0.017425 ppm
Xylenes = 0.000371 ppm

Based on system efficiency calculations (enclosed) provided by the manufacturer, Environmental Products Northwest, Inc.

Note: The maximum concentrations were utilized to evaluate discharge concentrations. Too few data points are available to evaluate the average concentrations or discharge rates. Therefore, the maximum concentrations will serve as a conservative estimate of the average discharge concentrations and rates.

Calculation:

(flow rate - gal/day) (convert liters to gallons - l/gal) (discharge concentration - mg/l) (convert pounds to miligrams - lbs/mg) = pounds discharged per day - lbs/day

Benzene: $2.4x10^{-6}$ lbs/day
(7,200 gal/day) (3.785 l/gal) ($0.4*10^{-4}$ mg/l) ($2.2*0^{-6}$ lbs/mg) = $2.4*10^{-6}$ lbs/day

Toluene: $4.2*10^{-9}$ lbs/day
(7,200 gal/day) (3.785 l/gal) ($7.0*10^{-8}$ mg/l) ($2.2*10^{-6}$ lbs/mg) = $4.2*10^{-9}$ lbs/day

Ethylbenzene: $1.0*10^{-3}$ lbs/day
(7,200 gal/day) (3.785 l/gal) (0.017425 mg/l) ($2.2*10^{-6}$ lbs/mg) = $1.0*10^{-3}$ lbs/day

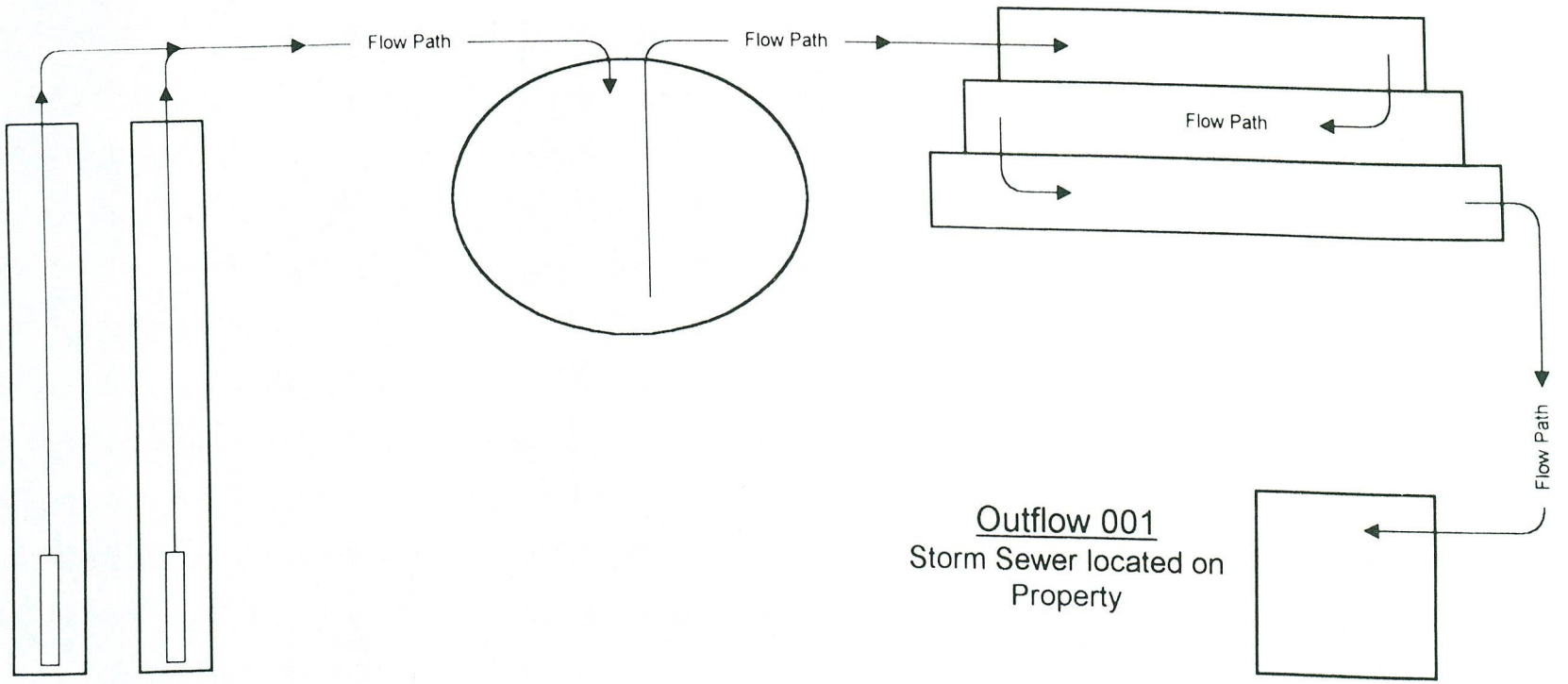
Xylenes: $2.2*10^{-5}$ lbs/day
(7,200 gal/day) (3.785 l/gal) ($3.71*10^{-4}$ mg/l) ($2.2*10^{-6}$ lbs/mg) = $2.2*10^{-5}$ lbs/day

SCHEMATIC PROCESS FLOW

Ground Water Recovery Wells
2.5 gpm per well
5 gpm total combined flow
7,200 gallons per day total combined flow

Gasoline Product / Water Seperator
skims floating gasoline product
7,200 gallons per day

Diffused Aeration Stripper
extracts volatile dissolved gasoline constituents from water
7,200 gallons per day



Outflow 001
Storm Sewer located on Property

DELCO PROJECT
17873 S.E. McLoughlin BLVD
Milwualkie, Oregon

FIGURE

Prepared By:
Martin S. Burck Associates, Inc.

C:\Visio\Drawings\NWEnviro\Delco\Process vsd-Page 1

COPY

Permit Number: 1500A
Expiration Date: 6/30/2000
Page 1 of 4 Pages

GENERAL PERMIT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

WASTE DISCHARGE PERMIT

Department of Environmental Quality
811 S.W. Sixth Avenue
Portland, OR 97204
Telephone: (503) 229-5696

Issued pursuant to ORS 468B.050 and the Federal Clean Water Act.

ISSUED TO:

ISSUED 8/24/95 GEN15A Clackamas/NWR
File No. 108705 OR004018-5
LUST# 03-93-008

Delco Petroleum Co., L.L.C.
14 Longleaf Dr
Hamilton Square NJ 06890
Re: 17873 SE McLoughlin Blvd., Milwaukie OR

SOURCES COVERED BY THIS PERMIT:

Discharge of water contaminated with petroleum hydrocarbons from groundwater or surface water cleanup operations.

Michael Downs, Administrator
Water Quality Division

JULY 24, 1995
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct approved waste water treatment and disposal systems and to discharge adequately treated waste waters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

Each other direct and indirect discharge of wastewaters is prohibited unless covered by another NPDES or WPCF permit.

SCHEDULE A

1. Waste Discharge Limitations not to be Exceeded by Facilities Covered by this General Permit.

When discharging to public waters:

Parameters	Limitations
TPH*	Shall not exceed 1.0 mg/L
BETX**	Shall not exceed 0.25 mg/L
Benzene	Shall not exceed 0.025 mg/L
pH	Shall be within range 6.0 - 9.0

* TPH means total petroleum hydrocarbons. EPA method 418.1, or equivalent, shall be used for TPH analysis.

** BETX means the cumulative total of benzene, ethylbenzene, toluene, and xylenes. EPA method 8020, or equivalent, shall be used for these analyses.

2. The effluent limits set forth in paragraph 1 are based on a mixing zone that is defined as follows:

   The allowable mixing zone shall not extend out into the stream more than one half the receiving stream width and shall not extend up or down the stream more than one receiving stream width. In no case shall the mixing zone extend beyond a radius of 10 meters from the point of discharge.

   The discharge flow rate shall be regulated so as to provide at least a 10:1 dilution of the effluent at all times in the receiving stream.

3. Excluding the parameters for which effluent limits have been established by this permit, no wastes shall be discharged to surface waters and no activities shall be conducted which will violate Water Quality Standards as adopted in OAR Chapter 340 Division 41, except in the mixing zone as defined in paragraph 2 above.

SCHEDULE B

Minimum Monitoring and Reporting Requirements

Outfall Number 001 (the permittee shall sample in accordance with the following sampling frequency from start-up to six months after startup)

Item or Parameter	Minimum Frequency	Sample Type
Flow	Weekly*	Estimate
pH	Weekly*	Grab
Total Petroleum Hydrocarbons	Weekly*	Grab
Benzene	Weekly	Grab
BETX	Weekly	Grab
Lead**	Monthly	Grab

* For the first five days of discharge, flow, pH, and total petroleum hydrocarbons (TPH) shall be measured daily.

Outfall Number 001 (the permittee shall sample in accordance with the following sampling frequency after six months from startup)

Item or Parameter	Minimum Frequency	Sample Type
Flow	Monthly	Estimate
pH	Monthly	Grab
Total Petroleum Hydrocarbons	Monthly	Grab
Benzene	Monthly	Grab
BETX	Monthly	Grab
Lead**	Monthly	Grab

** The requirement to monitor for lead applies only to those facilities that are treating water contaminated with leaded fuels and where detectable levels of lead have been found in the influent to the treatment system.

Reporting Procedures

Monitoring results shall be reported on approved forms. The reporting period is the calendar month. Reports must be submitted to the Department by the 15th day of the following month.

SCHEDULE D

Special Conditions

1. A "contact person" shall be designated to coordinate and carry out all necessary functions related to maintenance and operation of waste collection, treatment, and disposal facilities.

2. All free product shall be removed and disposed in accordance with applicable rules.

3. Prior to the use of any storm sewer system, the permittee shall have written permission from the owner of the storm sewer.

4. The permittee shall notify the Department within 24 hours of any breakdown or failure of the treatment system or failure to meet the effluent limitations.

5. This permit applies only to facilities that discharge treated water from petroleum hydrocarbon cleanup operations and does not apply to any other cleanup operation.

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NPDES GENERAL CONDITIONS

SECTION A. STANDARD CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468B.025 and is grounds for enforcement action; for permit termination, suspension, or modification; or for denial of a permit renewal application.

2. Penalties for Violations of Permit Conditions

Oregon Law (ORS 468.140) allows the Director to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit.

In addition, Oregon Law (ORS 468B.990) classifies a willful or negligent violation of the terms of a permit or failure to get a permit as a misdemeanor and a person convicted thereof shall be punishable by a fine of not more than $25,000 or by imprisonment for not more than one year, or by both. Each day of violation constitutes a separate offense.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, the permittee shall correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application shall be submitted at least 180 days before the expiration date of this permit.

The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions

This permit may be modified, suspended, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute;

b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

The filing of a request by the permittee for a permit modification or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Toxic Pollutants

The permittee shall comply with any applicable effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

7. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.

8. Permit References

Except for effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Duty to Halt or Reduce Activity

For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Bypass of Treatment Facilities

a. Definitions

(1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not include nonuse of singular or multiple units or processes of a treatment works when the nonuse is insignificant to the quality and/or quantity of the effluent produced by the treatment works. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes which causes them to become inoperable, or substantial

and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.

(1) Bypass is prohibited unless:

(a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The permittee submitted notices and requests as required under paragraph c of this section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when the Director determines that it will meet the three conditions listed above in paragraph b(1) of this section.

c. Notice and request for bypass.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior written notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section D, Paragraph D-5.

4. Upset

a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Section B.4.c. of these General Conditions are met. No determination made during administrative review of claims that non-compliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the causes(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in Section D.5., hereof (24-hour notice).

(4) The permittee complied with any remedial measures required under Section A.3 hereof.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

5. Treatment of Single Operational Event

For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without an NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definitions

(1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.

(3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

b. Prohibition of overflows. Overflows are prohibited unless:

(1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage;

(2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and

(3) The overflows are the result of an upset as defined in Condition B4 and meeting all requirements of this condition.

c. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

d. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in Condition D.5.

7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permittee shall take such steps as are necessary to alert the public about the extent and nature of the discharge. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

8. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in such a manner as to prevent any pollutant from such materials from entering public waters, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Sampling and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and shall be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Director.

2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

4. Penalties of Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years or both.

5. Reporting of Monitoring Results

Monitoring results shall be summarized each month on a Discharge Monitoring Report form approved by the Department. The reports shall be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. For a pollutant parameter that may be sampled more than once per day (e.g., Total Chlorine Residual), only the average daily value shall be recorded unless otherwise specified in this permit.

7. Averaging of Measurements

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean, except for bacteria which shall be averaged based on a geometric or log mean.

8. Retention of Records

The permittee shall retain records of all monitoring information, including all calibration and maintenance records of all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

9. Records Contents

Records of monitoring information shall include:

a. The date, exact place, time and methods of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

10. Inspection and Entry

The permittee shall allow the Director, or an authorized representative upon the presentation of credentials to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and

d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes

The permittee shall comply with Oregon Administrative Rules (OAR) 340, Division 52, "Review of Plans and Specifications". Except where exempted under OAR 340-52, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers shall be commenced until the plans and specifications are submitted to and approved by the Department. The permittee shall give notice to the Department as soon as possible of any planned physical alternations or additions to the permitted facility.

2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit shall be transferred to a third party without prior written approval from the Director. The permittee shall notify the Department when a transfer of property interest takes place.

4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. Twenty-Four Hour Reporting

The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally (by telephone) within 24 hours from the time the permittee becomes aware of the circumstances. During normal business hours, the Department's Regional office shall be called. Outside of normal business hours, the Department shall be contacted at 1-800-452-0311 (Oregon Accident Response System). A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

e. Public notification steps taken, pursuant to General Condition B-7.

The following shall be included as information which must be reported within 24 hours under this paragraph:

a. Any unanticipated bypass which exceeds any effluent limitation in this permit.

b. Any upset which exceeds any effluent limitation in the permit.

c. Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in the permit.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

6. Other Noncompliance

The permittee shall report all instances of non-compliance not reported under Section D4 or D5, at the time monitoring reports are submitted. The reports shall contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Department, it shall promptly submit such facts or information.

8. Signatory Requirements

All applications, reports or information submitted to the Department shall be signed and certified in accordance with 40 CFR 122.22.

9. Falsification of Reports

State law provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $1,000 per violation, or by imprisonment for not more than six months per violation, or by both.

10. Changes to Indirect Dischargers - **[Applicable to Publicly Owned Treatment Works (POTW) only]**

The permittee must provide adequate notice to the Department of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and;

b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For the purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

1. BOD means five-day biochemical oxygen demand.
2. TSS means total suspended solids (non-filterable residue).
3. Mg/l means milligrams per liter.
4. Kg means kilograms.
5. M^3/d means cubic meters per day.
6. MGD means million gallons per day.
7. Composite sample means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.
8. FC means fecal coliform bacteria.
9. Technology based permit effluent limitations means technology-based treatment requirements as defined in 40 CFR 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-41.
10. CBOD means five day carbonaceous biochemical oxygen demand.
11. Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.
12. Quarter means January through March, April through June, July through September, or October through December.
13. Month means calendar month.
14. Week means a calendar week of Sunday through Saturday.
15. Total residual chlorine means combined chlorine forms plus free residual chlorine.
16. The term "bacteria" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and enterococci bacteria.
17. POTW means a publicly owned treatment works.

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Project Design & Administration

Industrial Hygiene &
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