

LAKWOOD/PLAZA CLEANERS
LONG-TERM MONITORING ROUND III
NOVEMBER 12-13, 1991

by Pamela B. Marti
March 18, 1992

Washington State Department of Ecology
Environmental Investigations and Laboratory Services Program
Toxics, Compliance and Ground Water Investigations Section
Olympia, Washington 98504-7710

Water Body No. WA-12-1115GW
(Segment No. 05-12-GW)

ABSTRACT

The Toxics, Compliance, and Ground Water Investigations Section collected samples from monitoring wells located near the Lakewood/Plaza Cleaners Site on November 12-13, 1991. This sampling is part of routine ground water monitoring conducted in compliance with the Record of Decision (ROD). Observed concentrations for PERC, TCE, and 1,2-DCE have decreased substantially over the last year of monitoring.

OBJECTIVES

The Toxics Cleanup Program (TCP) requested that the Toxics, Compliance, and Ground Water Investigations Section conduct long-term monitoring of the ground water at the Lakewood/Plaza Cleaners Site on a semi-annual basis. Monitoring objectives are as follows:

1. Collect ground water quality data that can be used to evaluate the effectiveness of continued operation of Wells H1 and H2 to contain and remove contaminated ground water from the aquifer.
2. Monitor an uncaptured portion of the plume.
3. Monitor ground water upgradient of the site to determine if contaminants are migrating toward H1 and H2 from McChord Air Force Base (MCAFAB).

SITE BACKGROUND

In 1981, tetrachloroethylene (PERC), trichloroethylene (TCE), and 1,2-dichloroethylene (1,2-DCE) were detected in two Lakewood Water District supply wells (Wells H1 and H2), as shown on Figure 1. On-site disposal of waste solvents and sludges at Plaza Cleaners, located 800 feet north of the wells, was identified as the source of contamination. Site remediation consisted of removal of contaminated sludge and soils, soil-vapor extraction and installation of two air-stripping towers for Wells H1 and H2. Soil-vapor extraction was performed intermittently between March 1988 and April 1989. During operation, several hundred pounds of PERC were removed from the till that overlies the main aquifer in the area.

Results from on-site monitoring wells between 1985 to the present show that the pump and treat system has contained and reduced the level of ground water contamination (CH2M Hill, 1990). A portion of the contaminated plume located northwest of the site is not being captured by remedial pumping. However, contaminant concentrations in the uncaptured plume are decreasing; possibly due to biodegradation, dispersion, and/or dilution.

Upgradient monitoring wells were installed to detect possible contaminant migration from the adjacent McChord Air Force Base (MCAF). Previous studies (EPA, 1985) indicated potential contamination sources from MCAF are located within the long-term capture zone of Wells H1 and H2. Possible contaminants from McChord AFB include hydrocarbons, pesticides, and heavy metals.

Geology of the study area was defined in the Final Draft Remedial Investigation Report for Ponder's Corner, Washington (EPA, 1985) as consisting of four geologic units which are listed in order of increased depth; the Steilacoom Gravel, Vashon Till, Advance Outwash, and the Colvos Sands. The main units of interest are the Steilacoom Gravel, Vashon Till, and Advance Outwash. The Steilacoom Gravel is found throughout most of the study area and ranges in thickness from 1 to 58 feet. This unit often contains perched water which flows to the northwest near Wells H1 and H2, but to the south and southeast near the south end of Plaza Cleaners. The Vashon Till underlies the Steilacoom Gravel and ranges in thickness from 8 to 92 feet. Over most of the site the till (a mixture of clay, silt, sand, and gravel) forms an aquitard separating the Steilacoom Gravel, above, from the Advance Outwash, below. The Advance Outwash is the primary aquifer for the area. The predominant horizontal flow in the Advance Outwash is west-northwest when production Wells H1 and H2 are not in use. When in use, the wells create a large cone of depression. Previous studies showed that drawdowns occur in shallow monitoring wells drilled in the Steilacoom gravel when H1 and H2 are pumping (EPA, 1985). This indicates some hydraulic interconnection between the Steilacoom Gravel and the Advanced Outwash.

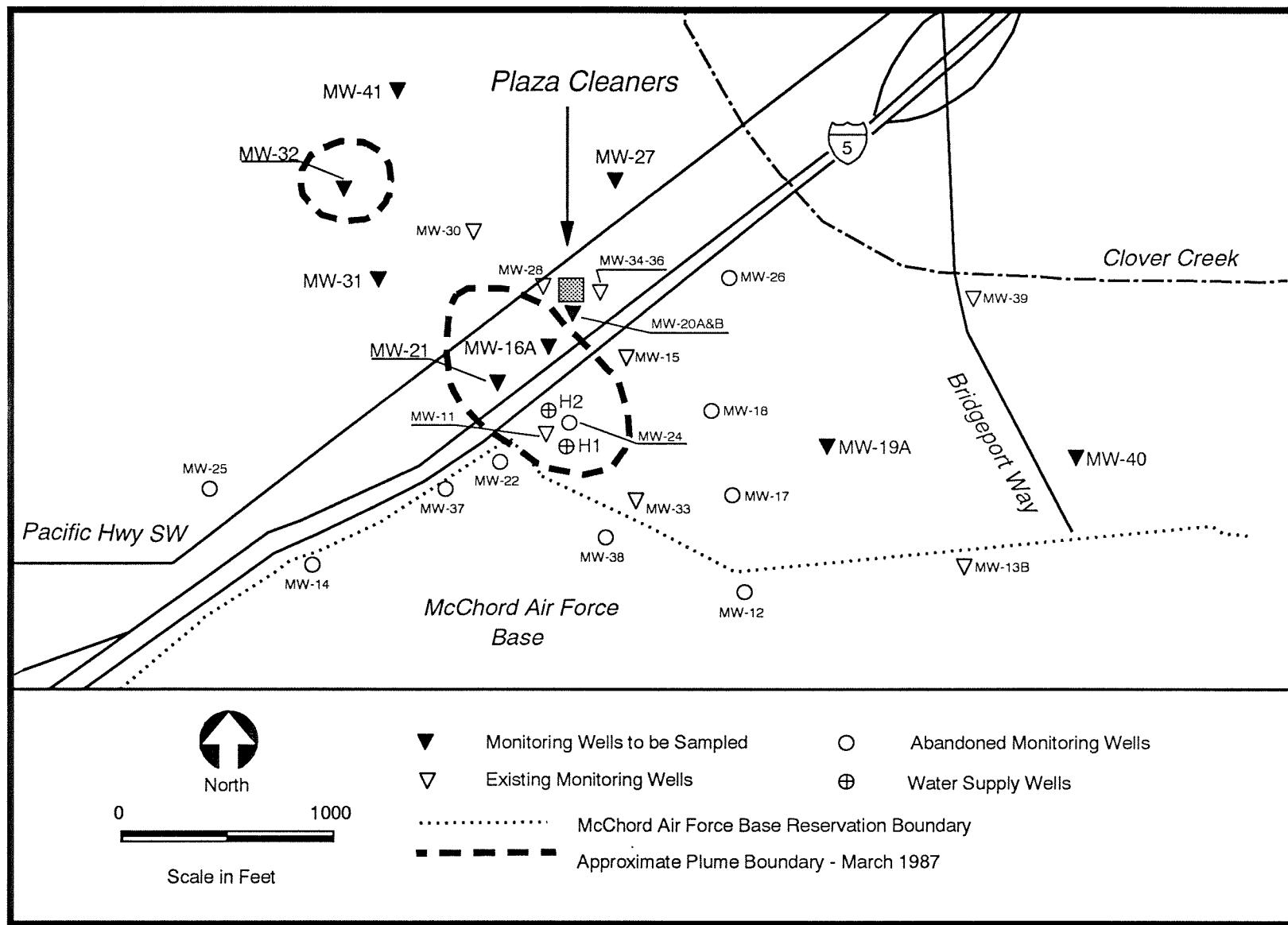


Figure 1: Well Location Map - Lakewood/Plaza Cleaners

METHODS

Ground Water Sampling

Samples were collected on November 12-13, 1991 from MW-16A, MW-20A, MW-20B, MW-21, MW-27, MW-31, MW-32, MW-41, MW-19, and MW-40. Figure 2 shows the locations of the wells. Prior to sample collection, static water level measurements were obtained from all wells using an electronic water level indicator which was rinsed with deionized water after each use. All monitoring wells were purged until a minimum of three well volumes had been removed and pH, temperature, and conductivity readings stabilized. Purge water was discharged to storm drains or to the ground near each monitoring well. All wells but one were purged and sampled using dedicated bladder pumps. Well MW-20B was purged and sampled with a decontaminated teflon bailer. Table 1 lists field observation data including well depth, geologic unit, static water level, pH, specific conductance, temperature, and purged volume in order the wells were sampled.

Wells were sampled from the least to most contaminated. Samples collected for volatile organics were free of headspace and preserved with two drops of 1:1 hydrochloric acid. Volatile organic samples were analyzed using EPA Method #624 (EPA, 1983).

Prior to sample collection, field equipment (i.e., bailers) were precleaned with a Liquinox® wash and sequential rinses of hot tap water, 10 percent nitric acid, distilled/deionized water, and pesticide-grade acetone, then air-dried and wrapped in aluminum until used. Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Huntamer and Hyre, 1991).

Quality Assurance Samples

In addition to laboratory calibration standards and method blanks, field quality assurance samples for volatile organic analysis consisted of a blind duplicate, replicate, transfer blank, transport blank, matrix spikes, and matrix spike duplicates.

A blind duplicate sample, labeled MW-16B, was collected from well MW-16A. Duplicate samples are two sets of samples collected from a well simultaneously and submitted to the laboratory with different identification. A replicate sample, labeled MW-20A**, was collected from well MW-20A. Replicate samples are two sets of samples collected from a well at different times, but using the same sampling methods. A transfer blank was collected by pouring organic-free water through a decontaminated bailer. And a transport blank was carried unopened throughout the sampling event.

Volatile organic analyses were performed by Analytical Resources, Inc., in Seattle, Washington. Laboratory quality assurance results were evaluated by Stuart Magoon of Manchester Laboratory and are included in Appendix A. Acetone and toluene were detected in all samples and in the associated method blank at similar concentrations. Estimated concentrations of acetone,

5

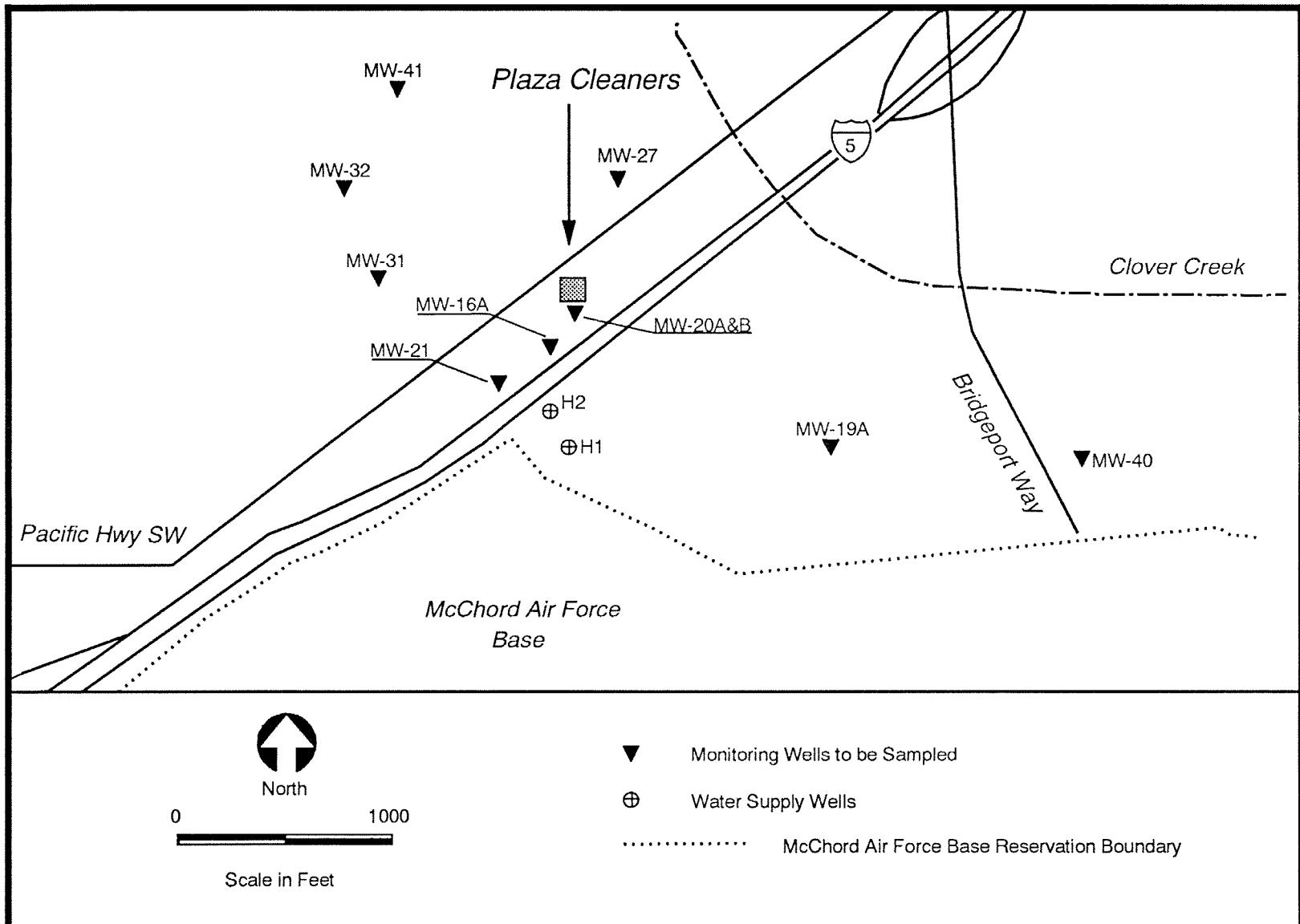


Figure 2: Lakewood/Plaza Cleaners Sample Locations for November 1991

Table 1: Field Parameter Results for November 12–13, 1991

Monitoring Well	TD From Top of PVC Casing As Measured	Geologic Unit Screened	Depth to Water	pH (st. units)	Specific Conductance (umhos/cm)	Temperature (C)	Purge Volume (gallons)
MW-40	75.1	Advance Outwash	37.65	7.54	269	11.2	18
MW-19A	97.5	Advance Outwash	43.4	7.25	192	11.8	27
MW-41	96.8	Advance Outwash	32.29	7.37	209	11.3	32
MW-27	96.4	Advance Outwash	++	7.07	196	12.1	22
MW-20A	97.3	Advance Outwash	37.77	9.40	218	12.6	30
MW-32	114.4	Advance Outwash	64.71	7.11	190	11.0	25
MW-31	91.5	Advance Outwash	++	6.85	190	10.9	32
MW-21	92.1	Advance Outwash	44.41	7.08	192	11.4	24
MW-16A	109	Advance Outwash	45.18	7.28	210	11.8	126
MW-20B	50.4	Vashon Till	40.99	6.73	1000	13.1	5

TD = Total Depth

++ = Water level was not measured due to obstruction in well.

methylene chloride, carbon disulfide, trichlorofluoromethane, and toluene were detected in the transfer blank at concentrations at or near the detection limit. The presence of these compounds is attributed to laboratory contamination and are therefore not reported. Analytical results qualified with "NJ" indicate that the analyte is present, but the associated numerical value is an estimate.

In general, the quality of the data is good. Overall, precision (sampling and laboratory) can be estimated by calculating the relative percent differences (RPDs, the percentage of the difference of two results divided by their mean) of duplicate results. The RPDs for tetrachloroethylene (PERC), 1,2-dichloroethylene (1,2-DCE), and benzene were 17%, 28%, and 40% respectively. However, RPDs for 1,2-DCE and benzene are based on values near the quantitation limit, and therefore are probably not representative of precision at higher concentrations. Matrix spike and spike duplicate recoveries for volatile organics are within the QC limits of $\pm 25\%$ for water sample analysis.

RESULTS

Table 2 is a summary of analytical results for Sample Round III conducted on November 12-13, 1991. Laboratory reporting sheets are presented in Appendix A. Data were managed using the ENVIS database software package.

Tetrachloroethylene (PERC), trichloroethylene (TCE) and 1,2-dichloroethylene (1,2-DCE) were detected primarily in the main plume. Maximum concentrations of these compounds were detected in Well MW-20B (PERC, 120 ppb; TCE, 2.6 ppb; and 1,2-DCE, 6.7 ppb). Low levels of PERC and 1,2-DCE were detected in Wells MW-16A, MW-20A, MW-21, MW-31 and MW-32, all of which were at or near the quantitation limit and qualified as estimates. TCE was detected in MW-19A below the quantitation limit. Benzene was also detected below the quantitation limit in Well MW-16A and the duplicate sample MW-16B.

DISCUSSION AND CONCLUSIONS

Table 3 shows PERC, TCE, and 1,2-DCE concentrations for January 1991 through November 1991. Concentrations of volatile organic contaminants in the main plume appear to be decreasing. Well MW-20B continues to have the highest concentrations of any of the wells sampled. Historical maximum concentrations for PERC and TCE recorded in Well MW-20B occurred in March 1985 at 4,856 ppb and 103 ppb, respectively. Appendix B presents concentrations of PERC and TCE measured in monitoring wells at the Lakewood site over the history of the project. During this sample round, concentrations of PERC, TCE, and 1,2-DCE in MW-20B were 120 ppb, 2.6 ppb, and 6.7 ppb, respectively. This well is close to Plaza Cleaners, is centrally located over the main plume, and is screened in the Vashon Till.

Table 2: Summary of Analytes Detected in Samples Collected During November 12-13, 1991

	Main Plume								Uncaptured Plume		McChord AFB	
	MW-16A	MW-16B*	MW-20A	MW-20A**	MW-20B	MW-21	MW-27	MW-31	MW-32	MW-41	MW-19A	MW-40
<u>Volatile Organics: (ug/L)</u>												
Tetrachloroethylene (PERC)	2.7 J	3.2 J	0.4 NJ	0.6 NJ	120	2.2 J	1.0 U	0.9 NJ	0.6 NJ	1.0 U	1.0 U	1.0 U
Trichloroethylene (TCE)	1.0 U	1.0 U	1.0 U	1.0 U	2.6 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.5 NJ	1.0 U
1,2-Dichloroethylene (1,2-DCE)	0.6 J	0.8 J	1.0 U	1.0 U	6.7	1.0 J	1.0 U	2.2 J	0.6 J	1.0 U	1.0 U	1.0 U
Benzene	0.6 J	0.4 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

* = Duplicate

** = Replicate

U = The analyte was not detected at or above the reported result.

J = The analyte was positively identified. The associated numerical result is an estimate.

NJ = There is evidence the analyte is present. The associated numerical value is an estimate.

Table 3: Summary of Sampling Results from January 1991 to November 1991

Well Number	January 1991			May 1991			November 1991		
	PERC	TCE	1,2-DCE	PERC	TCE	1,2-DCE	PERC	TCE	1,2-DCE
MW-16A	28	1 J	24 J	26	0.6 J	2	2.7 J	1.0 U	0.6 J
MW-20A	1.0 U	1.0 U	1.0 U	0.4 J	1.0 U	1.0 U	0.4 NJ	1.0 U	1.0 U
MW-20B	1100 D	18	33	752	16	30	120	2.6 J	6.7
MW-21	2.1 J	1.0 U	1 J	2	1.0 U	0.7 J	2.2 J	1.0 U	1.0 J
MW-27	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-31	1 J	1.0 U	1.9 J	0.6 J	1.0 U	2	0.9 NJ	1.0 U	2.2 J
MW-32	1 J	1.0 U	1.1 J	1	1.0 U	2	0.6 NJ	1.0 U	0.6 J
MW-41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-19A	--	--	--	--	--	--	1.0 U	0.5 NJ	1.0 U
MW-40	1.0 U	1.0 U	1.0 U	--	--	--	1.0 U	1.0 U	1.0 U

U =The analyte was not detected at or above the reported result.

J = The analyte was positively identified. The associated numerical result is an estimate.

D = Analysis performed at secondary dilution.

NJ = There is evidence the analyte is present. The associated numerical value is an estimate.

Low concentrations of PERC and 1,2-DCE were also detected in MW-16A with concentrations of 2.7 ppb and 0.6 ppb, respectively. Although concentrations have decreased in MW-16A since the last sampling round, concentrations continue to be higher in this well than those measured in MW-20A. Both wells are screened in the main aquifer below the contaminated Vashon Till, however, MW-16A is further from the source (See Figure 2). Higher contaminant concentrations in MW-16A are evidence that more permeable materials (lenses) in the overlying contaminated Vashon Till may be allowing downward migration of contaminants to the main aquifer.

Monitoring wells MW-41 and MW-32 were sampled to assess the quality of ground water in the uncaptured portion of the plume. PERC and 1,2-DCE were detected below the quantitation limits in MW-32 only.

Monitoring wells MW-19A and MW-40 were sampled to assess the quality of ground water upgradient of the site. TCE was detected in MW-19A, but below the quantitation limit. At this time there are insufficient data to indicate if this contaminant is from McChord AFB.

REFERENCES

- CH2M HILL, 1990. Sampling and Analysis Plan Remedial Action - Lakewood RA. April 1990.
- EPA, 1983. Methods for Chemical Analysis of Water and Wastes. Environmental Monitoring and Support Laboratory Cincinnati, Ohio, EPA 600/4-79-020.
- EPA, 1985. Final Draft Remedial Investigation Report - Ponder's Corner, Washington. EPA 112-0L22.
- Huntamer, D. and J. Hyre, 1991. Manchester Environmental Laboratory - Laboratory User's Manual. July 1991.

APPENDIX A

Analytical Results
Lakewood/Plaza Cleaners
November 12–13, 1991

State of Washington Department of Ecology
Manchester Environmental Laboratory
7411 Beach Dr. East, Port Orchard WA. 98366

Data Review
December 16, 1991

Project: **Lakewood/Plaza Cleaners**

Samples: 468080 468081 468082 468083 468084 468085 468086
468087 468088 468089 468090 468091 468092 468093

Laboratory: Analytical Resources Inc. 9449

By: Stuart Magoon *SM*

Case Summary

These analyses were reviewed for qualitative and quantitative accuracy, validity, and usefulness.

There is no need to assimilate the "dilution factor" or "sample wt/vol" into the final values reported; these calculations have already been figured into the reported values.

DATA QUALIFIER DEFINITIONS

U - The analyte was not detected at or above the reported result.

J - The analyte was positively identified. The associated numerical result is an estimate.

UJ - The analyte was not detected at or above the reported estimated result.

NJ - There is evidence that the analyte is present. The associated numerical value is an estimate.

Volatiles

Sample	Date Collect	Date Extd	Date Anlz	#Days collect to ext	#Days Collect to anal
158080	11/12	NA	11/20	NA	8 of 14
158081	11/12	NA	11/20	NA	8 of 14
158082	11/12	NA	11/20	NA	8 of 14
158083	11/12	NA	11/20	NA	8 of 14
158084	11/12	NA	11/20	NA	8 of 14
158085	11/13	NA	11/20	NA	7 of 14
158086	11/13	NA	11/20	NA	7 of 14
158087	11/13	NA	11/20	NA	7 of 14
158088	11/13	NA	11/20	NA	7 of 14
158089	11/13	NA	11/20	NA	7 of 14
158090	11/13	NA	11/21	NA	8 of 14
158091	11/13	NA	11/21	NA	8 of 14
158092	11/13	NA	11/21	NA	8 of 14
158093	11/12	NA	11/21	NA	9 of 14

All these samples were analyzed within the SW-846 recommended holding time.

Method Blanks:

Methylene Chloride and Toluene were detected in the method blank. Since the amount of Methylene Chloride and Toluene detected in these samples was near the same level as that of the method blank the presence of these analytes is most likely due to contamination (see the Case Narrative) and not native to any of the samples.

Surrogates:

Surrogate recoveries for these samples, the matrix spikes, and the associated method blanks are reasonable, acceptable and within QC limits.

Matrix spikes (MS/MSD):

Matrix spike recoveries and precision data are acceptable and within QC limits.

Sample Data:

This data is acceptable for use. Note that data qualifiers may modify the usefulness of the individual values. Some of the original data qualifiers have been modified. Acetone and Toluene were detected in all these samples and the associated method blank. In all cases I have changed the "B" qualifier to a "UJ" because the presence of the "B" qualified analytes is probably due to contamination and not native to the sample.

12 December 1991

REC'D
13-Dec-91
fm



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CASE NARRATIVE

dm

Stuart Magoon
Washington State Dept. of Ecology
P.O. Box 307
Manchester, WA 98353

RE: Project 'Lakewood Plaza Cleaners' - ARI Job #09449

Dear Stuart,

Please find enclosed the reports for the above referenced samples received 11/15/91 for volatile analysis only. These samples were received in good condition with no discrepancies in paperwork.

Following directions of the RCLS, a matrix spike and matrix spike duplicate were analyzed on sample **468087**.

Samples were analyzed on Finn 2 which met all requirements for tuning and calibration under EPA CLP protocol following the 6/91 SOW. Acetone was found at levels above the PQL, which were mistakenly attributed to remodeling at our facility. After these samples were completed and past holding times, it was determined the contamination was in the internal standard mix. No reanalyses were performed. All affected values have been flagged with a "B" indicating laboratory contamination.

Copies of this report and all associated paperwork will be kept on file at ARI should you have need of them.

If you have questions, please feel free to call me at any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Dunnahoo

Susan D. Rosa Dunnahoo
Project Manager

Enclosures

cc: File 09449



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WATER VOLATILE SURROGATE RECOVERY

ARI Job No: 9449

Client: WDOE
Project: Lakewood Plaza
Cleaners

S1 (TOL)=Toluene-d8
S2 (BFB=Bromofluorobenzene
S3 (DCE)=1,2-Dichloroethane-d4

QC LIMITS
(88-110)
(86-115)
(76-114)

Asterisked values outside QC Limits



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WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

ARI Job No: 9449

Client: WDOE

Sample No: #468087

Project: Lakewood Plaza
Cleaners

COMPOUND	SPIKE ADDED ($\mu\text{g}/\text{L}$)	SAMPLE CONC ($\mu\text{g}/\text{L}$)	MS CONC ($\mu\text{g}/\text{L}$)	MS % REC	QC LIMITS REC
1,1-Dichloroethene	50.0	0.0	54.2	108	61-145
Trichloroethene	50.0	0.0	49.7	99.4	71-120
Benzene	50.0	0.0	52.2	104	76-127
Toluene	50.0	1.36	49.3	96.0	76-125
Chlorobenzene	50.0	0.0	50.0	99.9	75-130

COMPOUND	SPIKE ADDED ($\mu\text{g}/\text{L}$)	MSD CONC ($\mu\text{g}/\text{L}$)	MSD % REC	% RPD	Q C LIMITS	
					RPD	REC
1,1-Dichloroethene	50.0	50.2	100	7.8	14	61-145
Trichloroethene	50.0	47.7	95.4	4.1	14	71-120
Benzene	50.0	51.1	102	2.1	11	76-127
Toluene	50.0	48.8	94.9	1.1	13	76-125
Chlorobenzene	50.0	48.8	97.6	2.4	13	75-130

RPD: 0 out of 5 outside limits

Spike Recovery: 0 out of 10 outside limits

Asterisked values outside QC Limits

Comments:



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VOLATILE METHOD BLANK SUMMARY

ARI Job No: 9449
Lab Sample ID: F31120MBA
Date Analyzed: 11/20/91
Matrix: Waters
Instrument ID: FINN III

Client: WDOE
Project: Lakewood Plaza
Cleaners

Time Analyzed: 16:45
Level: Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS,MSD:

Comments:



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VOLATILE METHOD BLANK SUMMARY

ARI Job No: 9449
Lab Sample ID: F31122MB
Date Analyzed: 11/22/91
Matrix: Waters
Instrument ID: FINN III

Client: WDOE
Project: Lakewood Plaza
Cleaners

Time Analyzed: 11:30
Level: Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS,MSD:

Comments:



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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449A
Matrix: Waters

Sample: #468080

(11/15/91)

Analytical
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Data Release Authorized: Ken K. Eber
Report prepared 11/27/91 - MAC:K kas

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
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Instrument: FINN III
Date Analyzed: 11/20/91

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	12 uJ 10-B
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 uJ 1.5-B
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromoform	97.5%
d4-1,2-Dichloroethane	95.0%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468080

Lab ID: 9449A

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza

Cleaners

VTSR: 11/15/91

Data Release Authorized: Barry N. Dohm

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	No UNKNOWN pk's >10% IS peak height	VOA	-	-
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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29				
30				



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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449B
Matrix: Waters

Data Release Authorized: John T. Schaefer
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/20/91

Sample: #468081

(encls - 19)

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	10.4 U 9.8 B fm
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	0.5 M
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2.4 U 1.4 B fm
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	102%
Bromofluorobenzene	97.7%
d4-1,2-Dichloroethane	95.1%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468081

Lab ID: 9449B

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: Brian H. Eber

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1 -	No UNKNOWN pks >10% IS peak height	VOA	-	-
2				
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ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449C
Matrix: Waters

Data Release Authorized: *Bruce N. Gaffey*
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/20/91

Sample: #468082

11/20/91

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

Analytical
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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	15 µS <i>14.8</i>
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 µS <i>1.4 B</i>
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	100%
Bromofluorobenzene	97.7%
d4-1,2-Dichloroethane	93.7%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468082

Lab ID: 9449C

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: Jim H. Baker

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	No UNKNOWN pk's >10% IS peak height	VOA	-
2				
3				
4				
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ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449D
Matrix: Waters

Sample: #468083

Analytical
Chemists &
Consultants

Data Release Authorized: John H. Schreier
Report prepared 11/27/91 - MAC:K kas

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Instrument: FINN III
Date Analyzed: 11/20/91

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	10 uJ 9.8 B
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 uJ 1.4 B
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	103%
Bromofluorobenzene	96.2%
d4-1,2-Dichloroethane	96.0%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468083

Lab ID: 9449D

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: Tom C. Baker

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	VOA	-	-
2				
3				
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**ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449E
Matrix: Waters

Data Release Authorized: Frank J. Kasten
Report prepared 11/27/91 - MAC:K kas

Sample: #468084

(11/15/91 - 20A)

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

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333 Ninth Ave. North
Seattle, WA 98109-518
(206) 621-6490
(206) 621-7523 (FAX)

Instrument: FINN III
Date Analyzed: 11/20/91

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	15 uT 12-B
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	0.4 M
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 uS 1.3-B
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	102%
Bromofluorobenzene	95.9%
d4-1,2-Dichloroethane	96.0%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468084

Lab ID: 9449E

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: Brian D. Eber

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	No UNKNOWN pks > 10% IS peak height	VOA	-
2				
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449F
Matrix: Waters

Data Release Authorized: John T. Gle
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/20/91

Sample: #468085

(600-2)

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

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Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	10 uJ 8.5-B
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	2.2 J
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	0.9 M
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 uJ 1.3-B
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	96.8%
d4-1,2-Dichloroethane	93.8%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468085

Lab ID: 9449F

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: Brian N. Johnson

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1 -	No UNKNOWN pk's >10% IS peak height	VOA	-	-
2				
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**ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449G
Matrix: Waters

Data Release Authorized: John V. Tefen
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/20/91

Sample: #468086

(m/e = 52)

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	11 UJ 10.5
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	0.6 J
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	0.6 M
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 UJ 1.48
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	96.5%
d4-1,2-Dichloroethane	93.1%



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333 Ninth Ave. North
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(206) 621-7523 (FAX)

ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468086

QC Report No: 9449-WDOE

Lab ID: 9449G

Project No: Lakewood Plaza

Matrix: Water

Cleaners

VTSR: 11/15/91

Data Release Authorized: John W. Giffen

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	No UNKNOWN pks >10% IS peak height	VOA	-
2				
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**ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449H
Matrix: Waters

Data Release Authorized: John H. Kras
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/20/91

Sample: #468087

11/20/91

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	10 uJ 8.95
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 J
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	2.2 J
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 uJ 14.8
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	97.0%
d4-1,2-Dichloroethane	93.4%



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(206) 621-6490
(206) 621-7523 (FAX)

ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468087

Lab ID: 9449H

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza

Cleaners

VTSR: 11/15/91

Data Release Authorized: Brian A. Schaefer

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1 -	No UNKNOWN pks >10% IS peak height	VOA	-	-
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ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 94491

Matrix: Waters

Data Release Authorized: Jim Peter
Report prepared 11/27/91 - MAC:K kas

Sample: #468088

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Analytical
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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Instrument: FINN III
Date Analyzed: 11/20/91

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone <i>1z us</i>	<i>11.8</i>
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	0.6 J
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	0.6 J
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	2.7 J
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene <i>3 us</i>	<i>2.0 B</i>
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	102%
Bromofluorobenzene	98.3%
d4-1,2-Dichloroethane	90.9%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468088

Lab ID: 94491

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza

Cleaners

VTSR: 11/15/91

Data Release Authorized: Brian N. Johnson

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	No UNKNOWN pks >10% IS peak height	VOA	-
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**ANALYTICAL
RESOURCES
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449J
Matrix: Waters

Data Release Authorized: Janet Lefever
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/20/91

Sample: #468089
(in mls - 11.8 ml)
QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

Analytical
Chemists &
Consultants

333 Ninth Ave North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	13 uJ -12.8
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	0.8 J
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	0.4 J
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	3.2 J
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	24 J -1.78
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	99.9%
Bromofluorobenzene	97.8%
d4-1,2-Dichloroethane	109%



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333 Ninth Ave. North
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468089

Lab ID: 9449J

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: Eric R. Rehm

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1 -	No UNKNOWN pk's >10% IS peak height	VOA	-	-
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ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449K
Matrix: Waters

Data Release Authorized: Barry L. Gier
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/21/91

Sample: #468090

11/15/91 - 200

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

Analytical
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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	11 UJ
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	6.7
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	2.6 J
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	120
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 UJ
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	103%
Bromofluorobenzene	98.7%
d4-1,2-Dichloroethane	93.2%



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333 Ninth Ave. North
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(206) 621-6490
(206) 621-7523 (FAX)

ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468090

Lab ID: 9449K

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: Brian K. Weber

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	No UNKNOWN pks >10% IS peak height	VOA	-	-
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**ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449L
Matrix: Waters

Data Release Authorized: John N. Lofgren
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/21/91

Sample: #468091

(methyl) - 3,3-dichloro-1-butene

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

Analytical
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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	12 uS 118
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	0.6 M
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 uS 1.3 B
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	96.9%
d4-1,2-Dichloroethane	102%



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333 Ninth Ave. North
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468091

QC Report No: 9449-WDOE

Lab ID: 9449L

Project No: Lakewood Plaza

Matrix: Water

Cleaners

VTSR: 11/15/91

Data Release Authorized: Tom H. Lehrer

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	No UNKNOWN pks >10% IS peak height	VOA	-
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**ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449M

Matrix: Waters

Data Release Authorized: Sam T. John
Report prepared 11/27/91 - MAC:K kas

Sample: #468092

(Toluene)

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Analytical
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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Instrument: FINN III
Date Analyzed: 11/21/91

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	5.4 J
67-64-1	Acetone	13 uJ 12-B
75-15-0	Carbon Disulfide	0.9 J
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	0.4 J

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2 uJ 1.6 B
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	94.4%
d4-1,2-Dichloroethane	88.5%



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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468092

Lab ID: 9449M

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Data Release Authorized: John H. Reber

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	No UNKNOWN pk's >10% IS peak height	VOA	-
2				
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ANALYTICAL
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449N

Matrix: Waters

Data Release Authorized: Frank L. Eber
Report prepared 11/27/91 - MAC:K kas

Sample: #468093

REPORT

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

Analytical
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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Instrument: FINN III
Date Analyzed: 11/21/91

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	12.45
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	2.45
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	99.9%
Bromofluorobenzene	95.8%
d4-1,2-Dichloroethane	94.0%



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Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: #468093

Lab ID: 9449N

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza

Cleaners

VTSR: 11/15/91

Data Release Authorized: John N. Schaefer

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	No UNKNOWN pk's >10% IS peak height	VOA	-
2				
3				
4				
5				
6				
7				
8				
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 1120MB
Matrix: Waters

Data Release Authorized: *[Signature]*
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/20/91

Sample: Method Blank

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: NA

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Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	9.2
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.2 J
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	102%
Bromofluorobenzene	101%
d4-1,2-Dichloroethane	98.9%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No:

Method Blank

QC Report No: 9449-WDOE

Lab ID: 1120MB

Project No: Lakewood Plaza

Matrix: Water

Cleaners

VTSR: NA

Data Release Authorized: Paul R. Glau

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	No UNKNOWN pk's >10% IS peak height	VOA	-
2				
3				
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 1122MB
Matrix: Waters

Sample: Method Blank

Data Release Authorized: Ann V. Weber
Report prepared 11/27/91 - MAC:K kas

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: NA

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Instrument: FINN III
Date Analyzed: 11/22/91

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	1.0 U
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	1.0 U
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	1.0 U
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	1.0 U
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.0 U
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	1.0 U
108-90-7	Chlorobenzene	1.0 U
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	104%
d4-1,2-Dichloroethane	99.5%



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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No:

Method Blank

Lab ID: 1122MB

Matrix: Water

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: NA

Data Release Authorized: Ben R. Zelcer

CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration ($\mu\text{g/L}$)
1	-	No UNKNOWN pk's >10% IS peak height	VOA	-
2				
3				
4				
5				
6				
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ORGANICS ANALYSIS DATA SHEET

Volatiles by Method 624/8240

Lab ID: 9449Hms
Matrix: Waters

Data Release Authorized: John T. Peter
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/22/91

Sample: #468087

Matrix Spike

QC Report No: 9449-WDOE
Project No: Lakewood Plaza
Cleaners
VTSR: 11/15/91

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333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	-
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	0.9 J
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	-
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	-
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	2.0 J
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	-
108-90-7	Chlorobenzene	-
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	99.7%
Bromofluorobenzene	105%
d4-1,2-Dichloroethane	102%



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Volatiles by Method 624/8240

Lab ID: 9449Hmsd

Matrix: Waters

Data Release Authorized: John P. Schaefer
Report prepared 11/27/91 - MAC:K kas

Instrument: FINN III
Date Analyzed: 11/22/91

Sample: #468087
Matrix Spike Dup.

QC Report No: 9449-WDOE

Project No: Lakewood Plaza
Cleaners

VTSR: 11/15/91

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Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Amount Purged: 5 mls
Conc/Dil: 1 to 1

CAS Number		µg/L
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	1.0 U
67-64-1	Acetone	5.0 U
75-15-0	Carbon Disulfide	1.0 U
75-35-4	1,1-Dichloroethene	-
75-34-3	1,1-Dichloroethane	1.0 U
156-60-5	Trans-1,2-Dichloroethene	1.0 U
156-59-2	Cis-1,2-Dichloroethene	0.9 J
67-66-3	Chloroform	1.0 U
107-06-2	1,2-Dichloroethane	1.0 U
78-93-3	2-Butanone	5.0 U
71-55-6	1,1,1-Trichloroethane	1.0 U
56-23-5	Carbon Tetrachloride	1.0 U
75-27-4	Bromodichloromethane	1.0 U
75-69-4	Trichlorofluoromethane	1.0 U

CAS Number		µg/L
78-87-5	1,2-Dichloropropane	1.0 U
10061-02-6	Trans-1,3-Dichloropropene	1.0 U
79-01-6	Trichloroethene	-
124-48-1	Dibromochloromethane	1.0 U
79-00-5	1,1,2-Trichloroethane	1.0 U
71-43-2	Benzene	-
10061-01-5	cis-1,3-Dichloropropene	1.0 U
75-25-2	Bromoform	1.0 U
108-10-1	4-Methyl-2-Pentanone	5.0 U
591-78-6	2-Hexanone	5.0 U
127-18-4	Tetrachloroethene	1.9 J
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U
108-88-3	Toluene	-
108-90-7	Chlorobenzene	-
100-41-4	Ethylbenzene	1.0 U
100-42-5	Styrene	1.0 U
1330-20-7	Total Xylenes	2.0 U
	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U

Surrogate Recoveries

d8-Toluene	101%
Bromofluorobenzene	105%
d4-1,2-Dichloroethane	101%

APPENDIX B

Historical TCE and PERC Data

Table B-1
TCE Concentrations Measured in Monitoring Wells
Ponders Corner, Washington

Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85	4/25/85	5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85 ^a	11/5/85 Through 11/7/85 ^a	8/25/86 Through 8/28/87	12/16/86 Through 12/17/86	3/17/87 Through 3/20/87	7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/4/88 Through 11/28/88	5/22/89 Through 5/25/89	4/23/90 Through 4/24/90
11A	ND	ND	NM	ND	ND	D	ND	ND	NM	NM		NM	NM	NM	NM	NM	NM
11B	NM	NM	NM	NM	NM	ND	NM	NM	NM	NM		NM	NM	NM	NM	NM	NM
12	ND	ND	ND	ND	ND	ND	ND	1 ^d	ND	ND	ND	ND	ND	ND	ND	NM	NM
13A	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
13B	NM	NM	NM	NM	NM	D	ND	1 ^d	1 ^d	2	ND	D	J	ND	NM	NM	NM
14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
15A	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
15B	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
16A	6.3	3.9	NM	3.4	2.0	D/D ^b	2 ^d	1 ^d	1 ^d	ND	ND	ND	NM	D	NM	ND	1
16B	NM	ND	NM	ND	ND	NM	NM	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
17A	ND	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
17B	NM	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
18	ND	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
19A	ND	ND	NM	ND	ND	ND	ND	ND	NM	ND	ND	ND	J	ND	ND	ND	ND
19B	NM	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
19C										NM	J	ND	NM	NM			
20A	NM	ND	NM	NM	ND	D	ND	ND	ND	NM	ND	NM	D	NM	ND	ND	ND
20B	NM	103	32	12	ND	D ^c	29	100	NM	NM	ND	NM	NM	NM	NM	29	24/23
21	1.5	ND	NM	ND	ND	D	6	1 ^d	1 ^d	1 ^d	NM	ND	NM	D	NM	ND	0.2J
22	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
24A	ND	ND	NM	ND	ND	1.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
24B	NM	ND	NM	ND	ND	D	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
25	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
26	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
27	ND	NM	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
28A	ND	ND	NM	ND	ND	NM	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
29	ND	ND	NM	ND	ND	ND	ND	ND	1 ^d	ND	NM	ND	NM	D	ND	ND	ND
30	1.6	ND	NM	ND	D	NM	ND	1 ^d	ND	ND	NM	ND	NM	D	ND	NM	
31	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
32	ND	ND	ND	ND	ND	D	ND	1 ^d	ND	ND	NM	ND	NM	ND	ND	ND	ND

Table B-1
TCE Concentrations Measured in Monitoring Wells
Ponders Corner, Washington

Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85		5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85 ^a	11/5/85 Through 11/7/85 ^b	8/25/86 Through 8/28/87	12/16/86 Through 12/17/86	3/17/87 Through 3/20/87		7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/4/88 Through 11/28/88	S/22/89 Through S/25/89	4/23/90 Through 4/24/90
33	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
34	ND	NM	NM	NM	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
35	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
36	42	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
37 ^c												ND	ND	ND	J	ND	ND	ND
38 ^c												15	ND	NM	NM	NM	NM	NM
39A ^c												1	ND	ND	ND	ND	ND	ND
39B ^c												ND	ND	NM	ND	ND	ND	NM
39C													NM	NM	ND	NM	NM	
40 ^c												ND	ND	ND	ND	ND	ND	
41 ^c												ND	ND	NM	NM	NM	ND	ND

^aExceeded acceptable holding time.

^bDuplicate analysis.

^cDetection limit = 100 µg/l.

dEstimated value. Compound present but at less than the specified detection limit.

eWells constructed 2/87 through 3/87.

Notes: Units in parts per billion.

NM = Not measured.

ND = Not detected.

D = Detected, not quantified.

J = Estimated value. Value not accurate.

Table B-2 PERC Concentrations Measured in Monitoring Wells Ponders Corner, Washington																	
Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85	4/25/85	5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85 ^a	11/5/85 Through 11/7/85 ^a	8/25/86 Through 8/28/86	12/16/86 Through 12/17/87	3/17/87 Through 3/20/87	7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/7/88 Through 11/28/88	5/22/89 Through 5/25/89	4/23/90 Through 4/24/90
11A	6.2	5.6	NM	6.1	2.7	4.3	2	1.4	NM	NM	NM	NM	NM	NM	NM	NM	NM
11B	NM	NM	NM	NM	NM	2.4	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NM	NM
13A	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
13B	NM	NM	NM	NM	NM	ND	ND	ND	ND	ND	ND	ND	J	ND	NM	NM	NM
14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
15A	NM	0.5	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
15B	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
16A	110	70	NM	46	33	12/11 ^b	19	16	17	49	NM	8	NM	7.3-8.0	NM	5(16)	74
16B	NM	15	NM	13	5	NM	4 ^c	4.5	NM	NM	NM	NM	NM	NM	NM	NM	NM
17A	ND	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
17B	NM	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
18	ND	ND	NM	ND	ND	D	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
19A	ND	ND	NM	ND	ND	ND	ND	ND	NM	ND	ND	J	ND	ND	ND	ND	ND
19B	NM	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	ND
19C										NM	J	ND	NM	NM	NM	NM	NM
20A	NM	5.1	NM	NM	2.8	4.0	ND	2.1	1.5	ND	NM	ND	NM	1.2	NM	ND	0.6J
20B	NM	4,856	2,200	570	1,220	1,060	350	745	NM	NM	ND	NM	NM	NM	NM	1,100 (880)	550 (1,300)
21	27	2.2	NM	13	11	10	ND	ND	4.6	4	NM	6	NM	4.0	NM	2J	3
22	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
24A	8.5	1.5	NM	7.2	4.4	16	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
24B	NM	9.5	NM	0.9	4.0	4.9	ND	2.9	NM	NM	NM	NM	NM	NM	NM	NM	NM
25	ND	ND	NM	ND	ND	ND	13	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
26	ND	ND	NM	NM	ND	ND	9	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
27	ND	NM	NM	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
28A	ND	0.7	NM	ND	ND	NM	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
29	5.8	0.9	NM	5.4	1.1	3.4	ND	12	2.8	ND	NM	ND	NM	1.8	ND	1J	0.8J
30	38	24.1	NM	17.2	13	NM	10	5.3	2.2	ND	NM	5	NM	3.8-4.7	3J	NM	
31	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM
32	ND	4.3	5	6.9	3.3	3.7	ND	2	1.5	2	NM	ND	NM	D	ND	1J	1

Table B-2
PERC Concentrations Measured in Monitoring Wells
Ponders Corner, Washington

Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85	4/25/85	5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85 ^a	11/5/85 Through 11/7/85 ^a	8/25/86 Through 8/28/86	12/16/86 Through 12/17/87	3/17/87 Through 3/20/87	7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/7/88 Through 11/28/88	5/22/89 Through 5/25/89	4/23/90 Through 4/24/90
33	ND	ND	NM	ND	ND	ND	ND	ND	ND	NM	NM	ND	ND	ND	ND	ND	
34	83	NM	NM	NM	NM	1.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
35	ND	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
36	139	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
37 ^d										ND	ND	ND	J	ND	ND	ND	
38 ^d										ND	ND	NM	NM	NM	NM	NM	
39A ^d										ND	ND	ND	J	D	ND	ND	
39B ^d										ND	ND	NM	NM	J	ND	ND	
39C												NM	NM	ND	NM	NM	
40 ^d										ND	ND	ND	J	ND	ND	ND	
41 ^d										ND	ND	NM	NM	NM	ND	ND	

^aExceeded acceptable holding time.

^bDuplicate analysis.

^cEstimated value. Compound present but at less than the specified detection limit.

^dWells constructed 2/87 through 3/87.

Notes: Units in $\mu\text{g/l}$.

NM = Not measured.

ND = Not detected.

D = Detected, not quantified.

J = Estimated value. Value not accurate.