



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

7171 Cleanwater Lane, Building 8, LH-14 • Olympia, Washington 98504

April 27, 1990

TO: Mike Gallagher
FROM: Laura Chern
SUBJECT: Toftdahl Drum Site Monitoring Round One

SUMMARY

The Toxics Investigations/Ground Water Monitoring Section collected ground water samples on October 17, 1989, as part of routine monitoring at the Toftdahl Drum site. Sample analyses showed low concentrations of copper and zinc in domestic wells. Metals concentrations did not exceed draft EPA drinking water standards.

INTRODUCTION

Objectives

The Toxics Investigations/Ground Water Monitoring Section was requested by the Hazardous Waste Investigations and Cleanup Program (HWICP) to monitor ground water at the Toftdahl Drum Site on a bi-annual basis. Monitoring objectives are as follows:

1. Provide routine ground water monitoring data as required by the federally mandated Record of Decision (ROD);
2. Provide HWICP with data to possibly explain past sporadic detection of poly-aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and semi-volatile organic compounds (BNAs);
3. Characterize ground water quality; and
4. Determine future sampling needs.

In addition, the Ginter well (Figure 1) was sampled for priority pollutant metals to determine if lead weights, inadvertently dropped down the well during a previous Ecology investigation, are affecting ground water quality.

SITE BACKGROUND

In the early 1970s, drums containing unknown quantities and types of waste were cleaned for resale on the Toftdahl property. The drums allegedly contained industrial wastes from a plywood manufacturing facility. It is

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estimated that between 100 and 200 drums were cleaned onsite. Approximately 50 drums contained residual wastes and could not be sold. These drums were buried on site (see Figure 1). In 1985, the buried drums and wastes were removed. A Remedial Investigation conducted after drum removal concluded that no evidence of significant soil or ground water contamination existed. Low concentrations of PAHs, PCBs, VOCs and BNAs were detected sporadically in nearby domestic water supply wells. The Record of Decision (ROD) prepared for the Toftdahl site requires ground water monitoring on a semi-annual basis for five years, and annually for ten years. In 1989, the site was delisted from the National Priorities List.

METHODS

Ground Water Sampling

Figure 1 shows locations of domestic wells sampled and the direction of ground water flow. Prior to sample collection, domestic water systems were purged by allowing taps to run until stable pH, specific conductivity, and temperature values were obtained. Samples were collected from the tap closest to the well head. Wells were sampled from upgradient to downgradient. All wells were sampled for VOCs, BNAs, PCBs, pesticides, cyanide, and total priority pollutant metals. Metal samples were preserved with 1 mL of concentrated nitric acid to a $\text{pH} \leq 2$.

Quality Assurance Samples

A duplicate sample and transport blank were submitted. Matrix spikes, matrix spike duplicates, and method blanks were analyzed for all parameters.

SAMPLE ANALYTICAL RESULTS

Sample analytical results are presented in Appendix A. Data are stored in the ENVIS database. Table 1 is a summary of contaminants found in sampling round one and a previous round of sampling conducted September 12, 1988, by Ecology. Copper, zinc and mercury were present in down-gradient wells at concentrations well below EPA draft drinking water standards. Mercury was found in the transport blank at higher concentrations than in either sample where it was detected. Matrix spikes, matrix spike duplicates, and method blanks were within contract laboratory program limits. Duplicate samples from the Tom domestic well (labeled East) showed similar analytical results.

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Table 1: Summary of Sampling Results from September 1988 and October 1989.

Location	pH	Temperature (degree C)	10/17/89				9/12/88		
			Specific Conduct.	Copper (mg/L)	Zinc (mg/L)	Mercury (ug/L)	Copper (mg/L)	Zinc (mg/L)	Mercury (ug/L)
Homala	6.72	10.0	89	ND	.02	.16B	NA		NA
Bedoff	6.92	10.9	125	.05	ND	ND	.12	ND	ND
Kyle	6.63	10.3	86	.03	.02	.10B	.04	.05	ND
Boone	6.84	11.8	110	.05	.29	ND	.08	.39	ND
Tom	6.68	12.4	93	.01	.01	ND	.03	.03	.1
East	--	--	--	ND	.02	ND	NA	NA	NA
Ginter	6.83	11.8	112	ND	ND	ND	NA	NA	NA
Transport Detection Limits			.01	.01	.06	.01	.01	.06	
Draft Drinking Water Standards			NA	NA	2	NA	NA	2	

NA: Not applicable.

ND: Not detected at limits shown.

B: Concentration detected less than that detected in the transport blank.

DISCUSSION AND CONCLUSIONS

Volatile and semi-volatile compounds, cyanide, pesticides and polychlorinated biphenyls analyses showed no detectable levels of contaminants in ground water samples (See Appendix A). Priority pollutant metals analyses showed detectable concentrations of copper and zinc. All analyses were well below EPA draft drinking water standards.

RECOMMENDATIONS

1. To determine if sampling should continue on an annual rather than semi-annual basis, an additional round of sampling should be conducted for priority pollutants and priority pollutant metals.
2. Downgradient wells Bedoff, Homala, and Kyle and upgradient well Boone should continue to be sampled for priority pollutants and priority pollutant metals annually. Based on data presented in this report, sampling at the Tom and Ginter wells should be discontinued.

LC:krc

cc: Bill Yake

Appendix A

State of Washington Department of Ecology
Manchester Environmental Laboratory
P.O. Box 307 Manchester, WA. 98353

Data Review

December 4, 1989

Project : Tofdahl

Samples : 428020 428021 428022 428023 428024
428025 428026 428027

Laboratory: Laucks Testing Laboratories 10122

By: Stuart Magoon *SM*

VOA Fraction (water)

Holding Times:

Sample	Date Collect	Date Man Rec'd	Date Lab Rec'd	Date Extd	Date Anlz	#Days From Collect
428020	10/16	10/17	10/18	NA	10/19	3 of 14
428021	10/16	10/17	10/18	NA	10/19	3 of 14
428022	10/16	10/17	10/18	NA	10/19	3 of 14
428023	10/16	10/17	10/18	NA	10/19	3 of 14
428024	10/16	10/17	10/18	NA	10/19	3 of 14
428025	10/16	10/17	10/18	NA	10/19	3 of 14
428026	10/16	10/17	10/18	NA	10/19	3 of 14
428027	10/16	10/17	10/18	NA	10/19	3 of 14

These samples have met all the CLP holding time requirements.

Surrogates: Surrogate recoveries for this sample, matrix spikes, and the method blanks are within the CLP recovery limits.

Matrix Spike & Matrix Spike Duplicate (MS/MSD): Matrix spike/spike duplicate recoveries and precision data are acceptable and within CLP limits.

Sample Data This data is acceptable for use. Note that data which is flagged with data qualifiers will modify the usefulness of the individual values.

TO: Washington Department of Ecology
 Project Name: Toftdahl
 Laboratory No.: 8910122
 Date of this report: November 28, 1989

The following samples were analyzed under the above laboratory number:

<u>Client I.D.</u>	<u>Lab I.D.</u>	<u>Analysis Requested</u>
428020	8910122-1	VOA
428021	8910122-2	VOA
428022	8910122-3	VOA
428023	8910122-4	VOA
428024	8910122-5	VOA
428026	8910122-6	VOA
428027	8910122-7	VOA

GENERAL REMARKS ON ORGANIC ANALYSES:

GC/MS Fractions:

Compounds may be called out as hits on the computerized printout. However, if they are not reported on the OADS (sample results) form, the mass spectral data have been manually searched and the compounds have been eliminated as hits based on this search.

Volatile Fraction:

All volatile analyses were performed using a DB-624 megabore capillary. The elution order and retention times differ from those stated for packed column analysis in the U.S.E.P.A.'s Statement of Work for organic CLP analyses. Listed below are the correct elution order and the internal standard with which each compound is associated.

<u>Bromochloromethane(IS)</u>	<u>1,4-Difluorobenzene(IS)</u>	<u>d5-Chlorobenzene(IS)</u>
Chloromethane	Benzene	4-Methyl-2-Pentanone
Vinyl Chloride	Trichloroethylene	Toluene
Bromomethane	1,2-Dichloropropane	d8-Toluene(SURR)
Chloroethane	Bromodichloromethane	Trans-1,3-Dichloropropene
1,1-Dichloroethylene	Cis-1,3-Dichloropropene	1,1,2-Trichloroethane
Acetone		Tetrachloroethylene
Carbon Disulfide		2-Hexanone
Methylene Chloride		Dibromochloromethane
Trans-1,2-Dichloroethylene		Chlorobenzene
1,1-Dichloroethane		Ethylbenzene

Vinyl Acetate
Cis-1,2-Dichloroethylene
2-Butanone
Chloroform
1,1,1-Trichloroethane
Carbon Tetrachloride
1,2-Dichloroethane
d4-1,2-Dichloroethane(SURR)

Styrene
M,P-Xylene
O-xylene
Bromoform
1,1,2,2-Tetrachloroethane
Bromofluorobenzene(SURR)

The analytes listed above were assigned to their respective internal standards on the basis of relative retention time (RRT). For all compounds except cis-1,3-dichloropropene, the RRTs fall between 0.8 and 1.2. Cis-1,2-dichloropropene was the only compound to fall outside of this range, and was assigned to the internal standard closest to its retention time.

Separation of cis- and trans- dichloroethylene isomers is achievable on a DB-624 megabore capillary column. These compounds have been found to coelute on the packed column specified in the U.S.E.P.A.'s Statement of Work. When these isomers are found in a sample, they will be reported as total-1,2-dichloroethylene.

A holding blank was analyzed in the same QC period with the samples from this set. The raw data were not submitted with the case. It will be held on file at Laucks should future review be necessary.

SPECIFIC REMARKS ON ORGANIC ANALYSES:

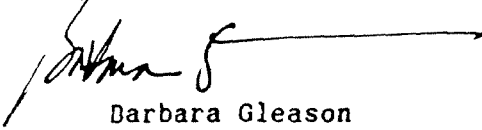
VOA Fraction:

No comment.

RELEASE OF DATA

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette (if requested) has been authorized by the Laboratory Manager or his designee, as verified by the following signatures.

Respectfully submitted,



Barbara Gleason
Operations Manager

11-28-89
(date)



Mike Nelson
Chief Chemist

11/28/89
(date)

QA
WATER VOLATILE SURROGATE RECOVERY

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

	SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	VBLKJ1	102	101	95		0
02	428020	104	102	97		0
03	428021	103	103	98		0
04	428022	102	100	95		0
05	428023	99	98	95		0
06	428024	100	97	93		0
07	428025	104	101	93		0
08	428027	103	102	95		0
09	428023MS	107	105	97		0
10	428023MSD	104	100	95		0
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QC LIMITS

S1 (TOL) = Toluene-d8 (88-110)
 S2 (BFB) = Bromofluorobenzene (86-115)
 S3 (DCE) = 1,2-Dichloroethane-d4 (75-114)

- # Column to be used to flag recovery values
- * Values outside of contract required QC limits
- 0 Surrogates diluted out

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix Spike ----- Sample No.: 428023

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.000	0.000	47.600	95	61-145
Trichloroethene	50.000	0.000	46.500	93	71-120
Benzene	50.000	0.000	45.400	91	76-127
Toluene	50.000	0.000	47.800	96	76-125
Chlorobenzene	50.000	0.000	45.900	92	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD REC.
1,1-Dichloroethene	50.000	46.800	94	2	14 61-145
Trichloroethene	50.000	43.700	87	6	14 71-120
Benzene	50.000	45.400	91	0	11 76-127
Toluene	50.000	47.000	94	2	13 76-125
Chlorobenzene	50.000	45.000	90	2	13 75-130

= Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
 Spike Recovery: 0 out of 10 outside limits

Comments: _____

3A
VOLATILE METHOD BLANK SUMMARY

Lab Name: Laucks Testing Labs Contract: _____
 Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SOG No.: 42802
 Lab File ID: B1019MVOWJ1 Lab Sample ID: B1019MVOWJ1
 Date Analyzed: 10/19/89 Time Analyzed: 13.32
 Matrix: (soil/water) WATER Level:(low/med) LOW
 Instrument ID: 1020J

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

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	428020	10122-01A	10122V01	14.10
02	428021	10122-02A	10122V02	14.48
03	428022	10122-03A	10122V03	15.26
04	428023	10122-04A	10122V04	16.03
05	428024	10122-05A	10122V05	16.42
06	428025	10122-06A	10122V06	17.20
07	428027	10122-07A	10122V07	17.59
08	428023MS	10122-04AMS	10122V04MS	18.39
09	428023MSD	10122-04AMSD	10122V04MSD	19.18
10	-----	-----	-----	-----
11	-----	-----	-----	-----
12	-----	-----	-----	-----
13	-----	-----	-----	-----
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COMMENTS: _____

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

428020

Boone

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS Case No.: _____

SAS No. _____

DOB No. 42802

Matrix: (soil/water) WATER

Lab Sample ID. 10122-01A

Sample wt/vol. 5.0 (g/ml) ML

Lab File ID: 10122V01

Level: (low/med) LOW

Date Received. 10/18/89

Moisture. not dec. __

Date Analyzed: 10/19/89

Column. (pack/cap) CAP

Dilution Factor. 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-07-3	Chloromethane	10 U	
74-83-9	Bromomethane	10 U	
75-01-4	Vinyl Chloride	10 U	
75-00-3	Chloroethane	10 U	
75-09-2	Methylene Chloride	5 U	
67-64-1	Acetone	10 U	
75-15-0	Carbon Disulfide	5 U	
75-35-4	1,1-Dichloroethene	5 U	
75-34-3	1,1-Dichloroethane	5 U	
540-59-0	1,2-Dichloroethene (total)	5 U	
67-56-3	Chloroform	5 U	
107-06-2	1,2-Dichloroethane	5 U	
70-93-3	2-Butanone	10 U	
71-55-6	1,1,1-Trichloroethane	5 U	
56-20-5	Carbon Tetrachloride	5 U	
108-05-4	Vinyl Acetate	10 U	
75-27-4	Bromodichloromethane	5 U	
78-37-5	1,2-Dichloropropane	5 U	
10061-01-5	cis-1,3-Dichloropropene	5 U	
79-01-6	Trichloroethene	5 U	
124-48-1	Dibromochloromethane	5 U	
79-00-5	1,1,2-Trichloroethane	5 U	
71-43-2	Benzene	5 U	
10061-02-6	Trans-1,3-Dichloropropene	5 U	
75-25-2	Bromoform	5 U	
108-10-1	4-Methyl-2-Pentanone	10 U	
591-78-6	2-Hexanone	10 U	
127-18-4	Tetrachloroethene	5 U	
79-34-5	1,1,2,2-Tetrachloroethane	5 U	
108-88-3	Toluene	5 U	
108-90-7	Chlorobenzene	5 U	
100-41-4	Ethylbenzene	5 U	
100-42-5	Styrene	5 U	
1330-20-7	Xylene (total)	5 U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

428020
Boone

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-01A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V01

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. __ Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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14
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name. Laucks Testing Labs

Contract: _____

428021

Tom

Lab Code. LAUCKS

Case No. _____

SAS No. _____

SDG No. 42802

Matrix. (soil/water)WATER

Lab Sample ID: 10122-02A

Sample wt/vol. 5.0 (g/ml)ML

Lab File ID. 10122V02

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture. not dec. __

Date Analyzed: 10/19/89

Column. (pack/cap) CAP

Dilution Factor: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NO.	COMPOUND	Q
74-87-3	Chloromethane	10 U
74-83-9	Bromomethane	10 U
75-01-4	Vinyl Chloride	10 U
75-00-3	Chloroethane	10 U
75-09-2	Methylene Chloride	5 U
57-64-1	Acetone	10 U
75-15-0	Carbon Disulfide	5 U
75-35-4	1,1-Dichloroethene	5 U
75-34-3	1,1-Dichloroethane	5 U
540-59-0	1,2-Dichloroethene (total)	5 U
67-66-3	Chloroform	5 U
107-06-2	1,2-Dichloroethane	5 U
78-60-3	2-Butanone	10 U
71-55-6	1,1,1-Trichloroethane	5 U
56-23-5	Carbon Tetrachloride	5 U
108-05-4	Vinyl Acetate	10 U
75-27-4	Bromodichloromethane	5 U
78-37-5	1,2-Dichloropropane	5 U
10061-01-5	cis-1,3-Dichloropropene	5 U
79-01-6	Trichloroethene	5 U
124-48-1	Dibromochloromethane	5 U
79-00-5	1,1,2-Trichloroethane	5 U
71-43-2	Benzene	5 U
10061-02-6	Trans-1,3-Dichloropropene	5 U
75-25-2	Bromoform	5 U
108-10-1	4-Methyl-2-Pentanone	10 U
591-78-6	2-Hexanone	10 U
127-18-4	Tetrachloroethene	5 U
79-34-5	1,1,2,2-Tetrachloroethane	5 U
108-88-3	Toluene	5 U
108-90-7	Chlorobenzene	5 U
100-41-4	Ethylbenzene	5 U
100-42-5	Styrene	5 U
1330-20-7	Xylene (total)	5 U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

428021
Tom

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-02A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V02

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs

Contract: _____

428022

Bedoff

Lab Code: LAUCKS

Case No.: _____

SAS No. _____

SDG No. 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-03A

Sample wt/vol. 5.0 (g/ml)ML

Lab File ID: 10122V03

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. ___

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CONCENTRATION UNITS.
(ug/L or ug/Kg)UG/L

CAS NO.

COMPOUND

Q

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
73-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
103-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

428022

Bedoff

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-03A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V03

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. __ Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

429023

Kyle

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS

Case No.: _____

SAS No.: _____

SDG No.: 42902

Matrix: (soil/water)WATER

Lab Sample ID: 10122-04A

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V04

Level: (low/med) LOW

Date Received: 10/13/89

Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
---------	----------	---	---

74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-2	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
55-20-5	Carbon Tetrachloride	5	U
103-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-04-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1C
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

428023
Kyle

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS

Case No.: _____

SAS No.: _____

SDS No.: 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-04A

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V04

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. ___

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs

Contract: _____

428024

Homala

Lab Code: LAUCKS

Case No.: _____

SAS No. _____

SDG No.: 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-05A

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V05

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
74-87-3	Chloromethane	10 U	
74-83-9	Bromomethane	10 U	
75-01-4	Vinyl Chloride	10 U	
75-00-3	Chloroethane	10 U	
75-09-2	Methylene Chloride	5 U	
67-64-1	Acetone	10 U	
75-15-0	Carbon Disulfide	5 U	
75-35-4	1,1-Dichloroethene	5 U	
75-34-3	1,1-Dichloroethane	5 U	
540-59-0	1,2-Dichloroethene (total)	5 U	
67-66-3	Chloroform	5 U	
107-06-2	1,2-Dichloroethane	5 U	
78-93-3	2-Butanone	10 U	
71-55-8	1,1,1-Trichloroethane	5 U	
56-23-3	Carbon Tetrachloride	5 U	
108-05-4	Vinyl Acetate	10 U	
75-27-4	Bromodichloromethane	5 U	
78-87-5	1,2-Dichloropropane	5 U	
10061-01-5	cis-1,3-Dichloropropene	5 U	
79-01-6	Trichloroethene	5 U	
124-48-1	Dibromochloromethane	5 U	
79-00-5	1,1,2-Trichloroethane	5 U	
71-43-2	Benzene	5 U	
10061-02-6	Trans-1,3-Dichloropropene	5 U	
75-25-2	Bromoform	5 U	
108-10-1	4-Methyl-2-Pentanone	10 U	
591-78-6	2-Hexanone	10 U	
127-18-4	Tetrachloroethene	5 U	
79-34-5	1,1,2,2-Tetrachloroethane	5 U	
108-88-3	Toluene	5 U	
108-90-7	Chlorobenzene	5 U	
100-41-4	Ethylbenzene	5 U	
100-42-5	Styrene	5 U	
1330-20-7	Xylene (total)	5 U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

428024
Homala

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS

Case No.: _____

SAC No.: _____

SDG No.: 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-05A

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V05

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

428025
Dup. (Imm)

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ GAS No. _____ SOG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-06A

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: 10122V06

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. __ Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-56-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-90-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-20-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
103-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
 VOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

428026

Dup. (Tom)

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS

Case No.: _____

SAS No.: _____

SDG No. 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-06A

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V06

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. ___

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
 (ug/L or ug/Kg)UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Lab Name: Laucks Testing Labs

Contract: _____

428027

Transport

Lab Code: LAUCKS Case No.: _____

SAS No. _____

SDG No. 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-07A

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V07

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
74-87-0	Chloromethane	10	U
74-93-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-0	Chloroethane	10	U
75-09-2	Methylene Chloride	1	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
103-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-10-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

428027
Transport

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No. _____ SAS No. _____ SDG No. 42802

Matrix: (soil/water)WATER Lab Sample ID: 10122-07A

Sample wt/vol. 5.0 (g/ml)ML Lab File ID: 10122V07

Level: (low/med) LOW Date Received: 10/19/89

% Moisture: not dec. __ Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

VOLKJ1

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS

Case No.: _____

SAS No. _____

SDG No.: 42802

Matrix: (soil/water)WATER

Lab Sample ID: B1019MVOWJ1

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: B1019MVOWJ1

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CONCENTRATION UNITS:

(ug/L or ug/Kg)UG/L Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-2	Vinyl Chloride	10	U
75-00-0	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
57-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
109-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-07-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
78-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
78-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
78-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

VBLKJ1

Lab Name: Laucks Testing Labs Contract: _____

Lab Code: LAUCKS Case No.: _____ SAS No.: _____ SDG No.: 42802

Matrix: (soil/water)WATER Lab Sample ID: B1019MVOWJ1

Sample wt/vol: 5.0 (g/ml)ML Lab File ID: B1019MVOWJ1

Level: (low/med) LOW Date Received: 10/18/89

% Moisture: not dec. __ Date Analyzed: 10/19/89

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
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4				
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

428023MS

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS

Case No.: _____

SAS No. _____

SOG No.: 42802

Matrix: (soil/water)WATER

Lab Sample ID: 10122-04AMS

Sample wt/vol: 5.0 (g/ml)ML

Lab File ID: 10122V04MS

Level: (low/med) LOW

Date Received: 10/18/89

Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/L

CAS NO.

COMPOUND

Q

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg)UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-0	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-0	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
58-29-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-97-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-9	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-70-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1000-20-7	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

429023MSD

Lab Name: Laucks Testing Labs

Contract: _____

Lab Code: LAUCKS

Case No.: _____

GAS No. _____

SOG No.: 42902

Matrix: (soil/water) WATER

Lab Sample ID: 10122-04AMSD

Sample wt/vol: 5.0 (g/ml) ML

Lab File ID: 10122V04MSD

Level: (low/med) LOW

Date Received: 10/18/89

% Moisture: not dec. __

Date Analyzed: 10/19/89

Column: (pack/cap) CAP

Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-37-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-90-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-20-5	Carbon Tetrachloride	5	U
103-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-37-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1030-20-7	Xylene (total)	5	U

Officer: LZC

Account: D3P01

Actual

Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428020

Description: BOONE

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16

Gen Inorg/Phys-Speci		Water-Total Result Units		B/N/Acid Scan *** Continued ***		Water-Total Result Units		B/N/Acid Scan *** Continued ***		Water-Total Result Units	
Cyanide	Total	0.002U	mg/l								
Metals - PP		Water-Total Result Units		N-Nitrosodiphenylamine		REQ		Chrysene		REQ	
Arsenic	As-Total	REQ	ug/l	Fluorene		REQ		4,6-Dinitro-2-methylph+		REQ	
Lead	Pb-Total	REQ	ug/l	Hexachlorobutadiene		REQ		1,3-Dichlorobenzene		REQ	
Thallium	Tl-Total	REQ	ug/l	Pentachlorophenol		REQ		2,6-Dinitrotoluene		REQ	
Nickel	Ni-Total	REQ	ug/l	2,4,6-Trichlorophenol		REQ		N-Nitroso-di-n-Propyla+		REQ	
Silver	Ag-Total	REQ	ug/l	2-Nitroaniline		REQ		4-Chlorophenyl-phenyle+		REQ	
Antimony	Sb-Total	REQ	ug/l	2-Nitrophenol		REQ		bis(2-Chloroisopropyl)+		REQ	
Selenium	Se-Total	REQ	ug/l	Naphthalene		REQ					
Mercury	Hg-Total	REQ	ug/l	2-Methylnaphthalene		REQ					
Metals - ICP Scan		Water-Total Result Units		2-Chloronaphthalene		REQ		Pest/PCB - PP Scan		Water-Total Result Units	
Beryllium	Be-Total	REQ	ug/l	3,3'-Dichlorobenzidine		REQ		4,4'-DDT		0.003U ug/l	
Cadmium	Cd-Total	REQ	ug/l	2-Methylphenol		REQ		Chlordane		0.003U ug/l	
Chromium	Cr-Total	REQ	ug/l	1,2-Dichlorobenzene		REQ		gamma-BHC (Lindane)		0.003U ug/l	
Copper	Cu-Total	REQ	ug/l	o-Chlorophenol		REQ		Dieldrin		0.003U ug/l	
Lead	Pb-Total	REQ	ug/l	2,4,5-Trichlorophenol		REQ		Endrin		0.003U ug/l	
Nickel	Ni-Total	REQ	ug/l	Nitrobenzene		REQ		Methoxychlor		0.006U ug/l	
Zinc	Zn-Total	REQ	ug/l	3-Nitroaniline		REQ		4,4'-DDD		0.003U ug/l	
B/N/Acid Scan		Water-Total Result Units		4-Nitroaniline		REQ		4,4'-DDE		0.003U ug/l	
Benzo(a)pyrene		REQ		4-Nitrophenol		REQ		Heptachlor		0.003U ug/l	
2,4-Dinitrophenol		REQ		Benzyl Alcohol		REQ		Aldrin		0.003U ug/l	
Dibenzo(a,h)anthracene		REQ		4-Bromophenyl-phenylet+		REQ		alpha-BHC		0.003U ug/l	
Benzo(a)anthracene		REQ		2,4-Dimethylphenol		REQ		beta-BHC		0.003U ug/l	
4-Chloro-3-Methylphenol		REQ		4-Methylphenol		REQ		delta-BHC		0.003U ug/l	
Benzoic acid		REQ		1,4-Dichlorobenzene		REQ		alpha-Endosulfan		0.003U ug/l	
Hexachloroethane		REQ		4-Chloroaniline		REQ		Heptachlor epoxide		0.003U ug/l	
Hexachlorocyclopentadi+		REQ		Phenol		REQ		Endosulfan sulfate		0.003U ug/l	
Isophorone		REQ		bis(2-Chloroethyl)Ether		REQ		Endrin aldehyde		0.003U ug/l	
Acenaphthene		REQ		bis(2-Chloroethoxy)Met+		REQ		Toxaphene		0.09U ug/l	
Diethylphthalate		REQ		BIS(2-ETHYLHEXYL) PHTH+		REQ		PCB - 1260		0.03U ug/l	
Di-n-Butylphthalate		REQ		Di-n-Octyl Phthalate		REQ		PCB - 1254		0.03U ug/l	
Phenanthrene		REQ		Hexachlorobenzene		REQ		PCB - 1221		0.03U ug/l	
Butylbenzylphthalate		REQ		Anthracene		REQ		PCB - 1232		0.03U ug/l	
				1,2,4-Trichlorobenzene		REQ		PCB - 1248		0.03U ug/l	
				2,4-Dichlorophenol		REQ		PCB - 1016		0.03U ug/l	
				2,4-Dinitrotoluene		REQ		beta-Endosulfan		0.003U ug/l	
				Pyrene		REQ		PCB - 1242		0.03U ug/l	
				Dimethylphthalate		REQ		IntStd: Hexabromobenze+		89 % Recov	
				Dibenzofuran		REQ		IntStd: 4,4-Dibromoact+		55 % Recov	
				Benzo(ghi)perylene		REQ					
				Indeno(1,2,3-cd)pyrene		REQ					
				Benzo(b)fluoranthene		REQ					
				Fluoranthene		REQ					
				Benzo(k)fluoranthene		REQ					
				Acenaphthylene		REQ					

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Washington State Department of Ecology
Sample/Project Analysis Results

Officer: LZC

Account: D3P01

Project: DOE-008I TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428020

Description: BOONE

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Contract Lab Program		Water-Total	
		Result	Units
VOA	GC/MS	REQ	CLP

(Sample Complete)

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Washington State Department of Ecology
Sample/Project Analysis Results

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428021

Description: TOM

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Gen Inorg/Phys-Speci		Water-Total Result Units		B/N/Acid Scan *** Continued ***		Water-Total Result Units		B/N/Acid Scan *** Continued ***		Water-Total Result Units	
Cyanide	Total	0.002U	mg/l								
Metals - PP		Water-Total Result Units		B/N/Acid Scan *** Continued ***		Water-Total Result Units		B/N/Acid Scan *** Continued ***		Water-Total Result Units	
Arsenic	As-Total	REQ	ug/l	N-Nitrosodiphenylamine		REQ		Chrysene		REQ	
Lead	Pb-Total	REQ	ug/l	Fluorene		REQ		4,6-Dinitro-2-methylph+		REQ	
Thallium	Tl-Total	REQ	ug/l	Hexachlorobutadiene		REQ		1,3-Dichlorobenzene		REQ	
Nickel	Ni-Total	REQ	ug/l	Pentachlorophenol		REQ		2,6-Dinitrotoluene		REQ	
Silver	Ag-Total	REQ	ug/l	2,4,6-Trichlorophenol		REQ		N-Nitroso-di-n-Propyla+		REQ	
Antimony	Sb-Total	REQ	ug/l	2-Nitroaniline		REQ		4-Chlorophenyl-phenyle+		REQ	
Selenium	Se-Total	REQ	ug/l	2-Nitrophenol		REQ		bis(2-Chloroisopropyl)+		REQ	
Mercury	Hg-Total	REQ	ug/l	Naphthalene		REQ					
Metals - ICP Scan		Water-Total Result Units		2-Methylnaphthalene		REQ		Pest/PCB - PP Scan		Water-Total Result Units	
Beryllium	Be-Total	REQ	ug/l	2-Chloronaphthalene		REQ		4,4'-DDT	0.003U	ug/l	
Cadmium	Cd-Total	REQ	ug/l	3,3'-Dichlorobenzidine		REQ		Chlordane	0.003U	ug/l	
Chromium	Cr-Total	REQ	ug/l	2-Methylphenol		REQ		gamma-BHC (Lindane)	0.003U	ug/l	
Copper	Cu-Total	REQ	ug/l	1,2-Dichlorobenzene		REQ		Diieldrin	0.003U	ug/l	
Lead	Pb-Total	REQ	ug/l	o-Chlorophenol		REQ		Endrin	0.003U	ug/l	
Nickel	Ni-Total	REQ	ug/l	2,4,5-Trichlorophenol		REQ		Methoxychlor	0.006U	ug/l	
Zinc	Zn-Total	REQ	ug/l	Nitrobenzene		REQ		4,4'-DDD	0.003U	ug/l	
				3-Nitroaniline		REQ		4,4'-DDE	0.003U	ug/l	
				4-Nitroaniline		REQ		Heptachlor	0.003U	ug/l	
				4-Nitrophenol		REQ		Aldrin	0.003U	ug/l	
				Benzyl Alcohol		REQ		alpha-BHC	0.003U	ug/l	
				4-Bromophenyl-phenylet+		REQ		beta-BHC	0.003U	ug/l	
				2,4-Dimethylphenol		REQ		delta-BHC	0.003U	ug/l	
				4-Methylphenol		REQ		alpha-Endosulfan	0.003U	ug/l	
				1,4-Dichlorobenzene		REQ		Heptachlor epoxide	0.003U	ug/l	
				4-Chloroaniline		REQ		Endosulfan sulfate	0.003U	ug/l	
				Phenol		REQ		Endrin aldehyde	0.003U	ug/l	
				bis(2-Chloroethyl)Ether		REQ		Toxaphene	0.09U	ug/l	
				bis(2-Chloroethoxy)Met+		REQ		PCB - 1260	0.03U	ug/l	
				BIS(2-ETHYLHEXYL) PHTH+		REQ		PCB - 1254	0.03U	ug/l	
				Di-n-Octyl Phthalate		REQ		PCB - 1221	0.03U	ug/l	
				Hexachlorobenzene		REQ		PCB - 1232	0.03U	ug/l	
				Anthracene		REQ		PCB - 1248	0.03U	ug/l	
				1,2,4-Trichlorobenzene		REQ		PCB - 1016	0.03U	ug/l	
				2,4-Dichlorophenol		REQ		beta-Endosulfan	0.003U	ug/l	
				2,4-Dinitrotoluene		REQ		PCB - 1242	0.03U	ug/l	
				Pyrene		REQ		IntStd: Hexabromobenze+	85	% Recov	
				Dimethylphthalate		REQ		IntStd: 4,4-Dibromooct+	56	% Recov	
				Dibenzofuran		REQ					
				Benzo(ghi)perylene		REQ					
				Indeno(1,2,3-cd)pyrene		REQ					
				Benzo(b)fluoranthene		REQ					
				Fluoranthene		REQ					
				Benzo(k)fluoranthene		REQ					
				Acenaphthylene		REQ					

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Washington State Department of Ecology
Sample/Project Analysis Results

Officer: LZC

Account: D3P01

Project: DOE-008I TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428021

Description: TOM

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Contract Lab Program		Water-Total	
		Result	Units
VOA	GC/MS	REQ	CLP

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428022

Description: BEDOFF

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Gen Inorg/Phys-Speci		Water-Total		B/N/Acid Scan		Water-Total		B/N/Acid Scan		Water-Total	
		Result	Units	*** Continued ***		Result	Units	*** Continued ***		Result	Units
Cyanide	Total	0.002U	mg/l								
Metals - PP		Water-Total		N-Nitrosodiphenylamine		REQ		Chrysene		REQ	
		Result	Units	Fluorene		REQ		4,6-Dinitro-2-methylph+		REQ	
Arsenic	As-Total	REQ	ug/l	Hexachlorobutadiene		REQ		1,3-Dichlorobenzene		REQ	
Lead	Pb-Total	REQ	ug/l	Pentachlorophenol		REQ		2,6-Dinitrotoluene		REQ	
Thallium	Tl-Total	REQ	ug/l	2,4,6-Trichlorophenol		REQ		N-Nitroso-di-n-Propyla+		REQ	
Nickel	Ni-Total	REQ	ug/l	2-Nitroaniline		REQ		4-Chlorophenyl-phenyle+		REQ	
Silver	Ag-Total	REQ	ug/l	2-Nitrophenol		REQ		bis(2-Chloroisopropyl)+		REQ	
Antimony	Sb-Total	REQ	ug/l	Naphthalene		REQ					
Selenium	Se-Total	REQ	ug/l	2-Methylnaphthalene		REQ		Pest/PCB - PP Scan		Water-Total	
Mercury	Hg-Total	REQ	ug/l	2-Chloronaphthalene		REQ		Result		Units	
				3,3'-Dichlorobenzidine		REQ					
				2-Methylphenol		REQ					
				1,2-Dichlorobenzene		REQ		4,4'-DDT		0.004U ug/l	
				o-Chlorophenol		REQ		Chlordane		0.004U ug/l	
				2,4,5-Trichlorophenol		REQ		gamma-BHC (Lindane)		0.004U ug/l	
				Nitrobenzene		REQ		Dieldrin		0.004U ug/l	
				3-Nitroaniline		REQ		Endrin		0.004U ug/l	
				4-Nitroaniline		REQ		Methoxychlor		0.008U ug/l	
				4-Nitrophenol		REQ		4,4'-DDD		0.004U ug/l	
				Benzyl Alcohol		REQ		4,4'-DDE		0.004U ug/l	
				4-Bromophenyl-phenylet+		REQ		Heptachlor		0.004U ug/l	
				2,4-Dimethylphenol		REQ		Aldrin		0.004U ug/l	
				4-Methylphenol		REQ		alpha-BHC		0.004U ug/l	
				1,4-Dichlorobenzene		REQ		beta-BHC		0.004U ug/l	
				4-Chloroaniline		REQ		delta-BHC		0.004U ug/l	
				Phenol		REQ		alpha-Endosulfan		0.004U ug/l	
				bis(2-Chloroethyl)Ether		REQ		Heptachlor epoxide		0.004U ug/l	
				bis(2-Chloroethoxy)Met+		REQ		Endosulfan sulfate		0.004U ug/l	
				BIS(2-ETHYLHEXYL) PHTH+		REQ		Endrin aldehyde		0.004U ug/l	
				Di-n-Octyl Phthalate		REQ		Toxaphene		0.12U ug/l	
				Hexachlorobenzene		REQ		PCB - 1260		0.04U ug/l	
				Anthracene		REQ		PCB - 1254		0.04U ug/l	
				1,2,4-Trichlorobenzene		REQ		PCB - 1221		0.04U ug/l	
				2,4-Dichlorophenol		REQ		PCB - 1232		0.04U ug/l	
				2,4-Dinitrotoluene		REQ		PCB - 1248		0.04U ug/l	
				Pyrene		REQ		PCB - 1016		0.04U ug/l	
				Dimethylphthalate		REQ		beta-Endosulfan		0.004U ug/l	
				Dibenzofuran		REQ		PCB - 1242		0.04U ug/l	
				Benzo(ghi)perylene		REQ		IntStd: Hexabromobenze+		94 % Recov	
				Indeno(1,2,3-cd)pyrene		REQ		IntStd: 4,4-Dibromooc+		52 % Recov	
				Benzo(b)fluoranthene		REQ					
				Fluoranthene		REQ					
				Benzo(k)fluoranthene		REQ					
				Acenaphthylene		REQ					

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Washington State Department of Ecology
Sample/Project Analysis Results

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428022

Description: BEDOFF

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Pest/PCB - PP Scan Matrix Spike #1	Water-Total Result	Units	Contract Lab Program	Water-Total Result	Units
4,4'-DDT	51	% Recov	VOA		CLP
Chlordane	NOT SPIKD	% Recov			
gamma-BHC (Lindane)	86	% Recov			
Dieldrin	52	% Recov			
Endrin	48	% Recov			
Methoxychlor	51	% Recov			
4,4'-DDD	52	% Recov			
4,4'-DDE	51	% Recov			
Heptachlor	67	% Recov			
Aldrin	60	% Recov			
alpha-BHC	54	% Recov			
beta-BHC	95	% Recov			
delta-BHC	74	% Recov			
alpha-Endosulfan	56	% Recov			
Heptachlor epoxide	62	% Recov			
Endosulfan sulfate	51	% Recov			
Endrin aldehyde	47	% Recov			
beta-Endosulfan	54	% Recov			
IntStd: Hexabromobenze+	87	% Recov			
IntStd: 4,4-Dibromooct+	75	% Recov			

Pest/PCB - PP Scan Matrix Spike #2	Water-Total Result	Units
4,4'-DDT	57	% Recov
Chlordane	NOT SPIKD	% Recov
gamma-BHC (Lindane)	96	% Recov
Dieldrin	96	% Recov
Endrin	52	% Recov
Methoxychlor	61	% Recov
4,4'-DDD	63	% Recov
4,4'-DDE	62	% Recov
Heptachlor	81	% Recov
Aldrin	67	% Recov
alpha-BHC	66	% Recov
beta-BHC	103	% Recov
delta-BHC	80	% Recov
alpha-Endosulfan	61	% Recov
Heptachlor epoxide	66	% Recov
Endosulfan sulfate	56	% Recov
Endrin aldehyde	44	% Recov
beta-Endosulfan	77	% Recov
IntStd: Hexabromobenze+	102	% Recov
IntStd: 4,4-Dibromooct+	101	% Recov

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428023

Description: KYLE

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Gen Inorg/Phys-Speci		Water-Total		B/N/Acid Scan		Water-Total		B/N/Acid Scan		Water-Total	
		Result	Units	*** Continued ***		Result	Units	*** Continued ***		Result	Units
Cyanide	Total	0.002U	mg/l	N-Nitrosodiphenylamine	REQ			Chrysene		REQ	
Metals - PP				Hexachlorobutadiene		REQ		4,6-Dinitro-2-methylph+		REQ	
Arsenic	As-Total	REQ	ug/l	Pentachlorophenol	REQ		1,3-Dichlorobenzene		REQ		
Lead	Pb-Total	REQ	ug/l	2,4,6-Trichlorophenol	REQ		2,6-Dinitrotoluene		REQ		
Thallium	Tl-Total	REQ	ug/l	2-Nitroaniline	REQ		N-Nitroso-di-n-Propyla+		REQ		
Nickel	Ni-Total	REQ	ug/l	2-Nitrophenol	REQ		4-Chlorophenyl-phenyle+		REQ		
Silver	Ag-Total	REQ	ug/l	Naphthalene	REQ		bis(2-Chloroisopropyl)+		REQ		
Antimony	Sb-Total	REQ	ug/l	2-Methylphenol	REQ		Pest/PCB - PP Scan				
Selenium	Se-Total	REQ	ug/l	2-Chloronaphthalene	REQ		4,4'-DDT	0.003U	ug/l		
Mercury	Hg-Total	REQ	ug/l	3,3'-Dichlorobenzidine	REQ		Chlordane	0.003U	ug/l		
Metals - ICP Scan				Nitrobenzene		REQ		gamma-BHC (Lindane)	0.003U	ug/l	
Beryllium	Be-Total	REQ	ug/l	3-Nitroaniline	REQ		Dieldrin	0.003U	ug/l		
Cadmium	Cd-Total	REQ	ug/l	4-Nitroaniline	REQ		Endrin	0.003U	ug/l		
Chromium	Cr-Total	REQ	ug/l	4-Nitrophenol	REQ		Methoxychlor	0.006U	ug/l		
Copper	Cu-Total	REQ	ug/l	Benzyl Alcohol	REQ		4,4'-DDD	0.003U	ug/l		
Lead	Pb-Total	REQ	ug/l	4-Bromophenyl-phenylet+	REQ		4,4'-DDE	0.003U	ug/l		
Nickel	Ni-Total	REQ	ug/l	2,4-Dimethylphenol	REQ		Heptachlor	0.003U	ug/l		
Zinc	Zn-Total	REQ	ug/l	4-Methylphenol	REQ		Aldrin	0.003U	ug/l		
B/N/Acid Scan				Phenol		REQ		alpha-BHC	0.003U	ug/l	
Benzo(a)pyrene		REQ		bis(2-Chloroethyl)Ether	REQ		beta-BHC	0.003U	ug/l		
2,4-Dinitrophenol		REQ		bis(2-Chloroethoxy)Met+	REQ		delta-BHC	0.003U	ug/l		
Dibenzo(a,h)anthracene		REQ		BIS(2-ETHYLHEXYL) PHTH+	REQ		alpha-Endosulfan	0.003U	ug/l		
Benzo(a)anthracene		REQ		Di-n-Octyl Phthalate	REQ		Heptachlor epoxide	0.003U	ug/l		
4-Chloro-3-Methylphenol		REQ		Hexachlorobenzene	REQ		Endosulfan sulfate	0.003U	ug/l		
Benzoic acid		REQ		Anthracene	REQ		Endrin aldehyde	0.003U	ug/l		
Hexachloroethane		REQ		1,2,4-Trichlorobenzene	REQ		Toxaphene	0.09U	ug/l		
Hexachlorocyclopentadi+		REQ		2,4-Dichlorophenol	REQ		PCB - 1260	0.03U	ug/l		
Isophorone		REQ		2,4-Dinitrotoluene	REQ		PCB - 1254	0.03U	ug/l		
Acenaphthene		REQ		Pyrene	REQ		PCB - 1221	0.03U	ug/l		
Diethylphthalate		REQ		Dimethylphthalate	REQ		PCB - 1232	0.03U	ug/l		
Di-n-Butylphthalate		REQ		Dibenzofuran	REQ		PCB - 1248	0.03U	ug/l		
Phenanthrene		REQ		Benzo(ghi)perylene	REQ		PCB - 1016	0.03U	ug/l		
Butylbenzylphthalate		REQ		Indeno(1,2,3-cd)pyrene	REQ		beta-Endosulfan	0.003U	ug/l		
				Benzo(b)fluoranthene	REQ		PCB - 1242	0.03U	ug/l		
				Fluoranthene	REQ		IntStd: Hexabromobenze+	97	% Recov		
				Benzo(k)fluoranthene	REQ		IntStd: 4,4-Dibromoocct+	65	% Recov		
				Acenaphthylene	REQ						

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Washington State Department of Ecology
Sample/Project Analysis Results

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428023

Description: KYLE

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Contract Lab Program		Water-Total	
		Result	Units
VOA	GC/MS	REQ	CLP

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428024

Description: HOMALA

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Gen Inorg/Phys-Speci	Water-Total Result Units	B/N/Acid Scan *** Continued ***	Water-Total Result Units	B/N/Acid Scan *** Continued ***	Water-Total Result Units
Cyanide Total	0.002U mg/l				
Metals - PP	Water-Total Result Units				
Arsenic As-Total	REQ ug/l	N-Nitrosodiphenylamine	REQ	Chrysene	REQ
Lead Pb-Total	REQ ug/l	Fluorene	REQ	4,6-Dinitro-2-methylph+	REQ
Thallium Tl-Total	REQ ug/l	Hexachlorobutadiene	REQ	1,3-Dichlorobenzene	REQ
Nickel Ni-Total	REQ ug/l	Pentachlorophenol	REQ	2,6-Dinitrotoluene	REQ
Silver Ag-Total	REQ ug/l	2,4,6-Trichlorophenol	REQ	N-Nitroso-di-n-Propyla+	REQ
Antimony Sb-Total	REQ ug/l	2-Nitroaniline	REQ	4-Chlorophenyl-phenyle+	REQ
Selenium Se-Total	REQ ug/l	2-Nitrophenol	REQ	bis(2-Chloroisopropyl)+	REQ
Mercury Hg-Total	REQ ug/l	Naphthalene	REQ		
Metals - ICP Scan	Water-Total Result Units	2-Methylnaphthalene	REQ	Pest/PCB - PP Scan	Water-Total Result Units
Beryllium Be-Total	REQ ug/l	2-Chloronaphthalene	REQ	4,4'-DDT	0.003U ug/l
Cadmium Cd-Total	REQ ug/l	3,3'-Dichlorobenzidine	REQ	Chlordane	0.003U ug/l
Chromium Cr-Total	REQ ug/l	2-Methylphenol	REQ	gamma-BHC (Lindane)	0.003U ug/l
Copper Cu-Total	REQ ug/l	1,2-Dichlorobenzene	REQ	Dieldrin	0.003U ug/l
Lead Pb-Total	REQ ug/l	o-Chlorophenol	REQ	Endrin	0.003U ug/l
Nickel Ni-Total	REQ ug/l	2,4,5-Trichlorophenol	REQ	Methoxychlor	0.006U ug/l
Zinc Zn-Total	REQ ug/l	Nitrobenzene	REQ	4,4'-DDD	0.003U ug/l
B/N/Acid Scan	Water-Total Result Units	3-Nitroaniline	REQ	4,4'-DDE	0.003U ug/l
Benzo(a)pyrene	REQ	4-Nitroaniline	REQ	Heptachlor	0.003U ug/l
2,4-Dinitrophenol	REQ	4-Nitrophenol	REQ	Aldrin	0.003U ug/l
Dibenzo(a,h)anthracene	REQ	Benzyl Alcohol	REQ	alpha-BHC	0.003U ug/l
Benzo(a)anthracene	REQ	4-Bromophenyl-phenylet+	REQ	beta-BHC	0.003U ug/l
4-Chloro-3-Methylphenol	REQ	2,4-Dimethylphenol	REQ	delta-BHC	0.003U ug/l
Benzoic acid	REQ	4-Methylphenol	REQ	alpha-Endosulfan	0.003U ug/l
Hexachloroethane	REQ	1,4-Dichlorobenzene	REQ	Heptachlor epoxide	0.003U ug/l
Hexachlorocyclopentadi+	REQ	4-Chloroaniline	REQ	Endosulfan sulfate	0.003U ug/l
Isophorone	REQ	Phenol	REQ	Endrin aldehyde	0.003U ug/l
Acenaphthene	REQ	bis(2-Chloroethyl)Ether	REQ	Toxaphene	0.09U ug/l
Diethylphthalate	REQ	bis(2-Chloroethoxy)Met+	REQ	PCB - 1260	0.03U ug/l
Di-n-Butylphthalate	REQ	BIS(2-ETHYLHEXYL) PHTH+	REQ	PCB - 1254	0.03U ug/l
Phenanthrene	REQ	Di-n-Octyl Phthalate	REQ	PCB - 1221	0.03U ug/l
Butylbenzylphthalate	REQ	Hexachlorobenzene	REQ	PCB - 1232	0.03U ug/l
		Anthracene	REQ	PCB - 1248	0.03U ug/l
		1,2,4-Trichlorobenzene	REQ	PCB - 1016	0.03U ug/l
		2,4-Dichlorophenol	REQ	beta-Endosulfan	0.003U ug/l
		2,4-Dinitrotoluene	REQ	PCB - 1242	0.03U ug/l
		Pyrene	REQ	IntStd: Hexabromobenze+	90 % Recov
		Dimethylphthalate	REQ	IntStd: 4,4-Dibromooc+	54 % Recov
		Dibenzofuran	REQ		
		Benzo(ghi)perylene	REQ		
		Indeno(1,2,3-cd)pyrene	REQ		
		Benzo(b)fluoranthene	REQ		
		Fluoranthene	REQ		
		Benzo(k)fluoranthene	REQ		
		Acenaphthylene	REQ		

(Continued on next page)

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Washington State Department of Ecology
Sample/Project Analysis Results

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Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428024

Description: HOMALA

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Contract Lab Program		Water-Total	
		Result	Units
VOA	GC/MS	REQ	CLP

(Sample Complete)

5-DEC-89
09:23:42

Washington State Department of Ecology
Sample/Project Analysis Results

Officer: LZC

Account: D3P01

Project: DOE-0081 TOFTDAHL DRUM SITE

Laboratory: Ecology, Manchester

Sample No: 89 428025

Description: GINTER

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Metals - PP		Water-Total	
		Result	Units
Arsenic	As-Total	REQ	ug/l
Lead	Pb-Total	REQ	ug/l
Thallium	Tl-Total	REQ	ug/l
Nickel	Ni-Total	REQ	ug/l
Silver	Ag-Total	REQ	ug/l
Antimony	Sb-Total	REQ	ug/l
Selenium	Se-Total	REQ	ug/l
Mercury	Hg-Total	REQ	ug/l

Metals - ICP Scan		Water-Total	
		Result	Units
Beryllium	Be-Total	REQ	ug/l
Cadmium	Cd-Total	REQ	ug/l
Chromium	Cr-Total	REQ	ug/l
Copper	Cu-Total	REQ	ug/l
Lead	Pb-Total	REQ	ug/l
Nickel	Ni-Total	REQ	ug/l
Zinc	Zn-Total	REQ	ug/l

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428026

Description: EAST

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Gen Inorg/Phys-Speci		Water-Total		B/N/Acid Scan		Water-Total		B/N/Acid Scan		Water-Total	
		Result	Units	*** Continued ***		Result	Units	*** Continued ***		Result	Units
Cyanide	Total	0.002U	mg/l	N-Nitrosodiphenylamine	REQ			Chrysene	REQ		
				Fluorene	REQ			4,6-Dinitro-2-methylph+	REQ		
				Hexachlorobutadiene	REQ			1,3-Dichlorobenzene	REQ		
				Pentachlorophenol	REQ			2,6-Dinitrotoluene	REQ		
				2,4,6-Trichlorophenol	REQ			N-Nitroso-di-n-Propyla+	REQ		
				2-Nitroaniline	REQ			4-Chlorophenyl-phenyle+	REQ		
				2-Nitrophenol	REQ			bis(2-Chloroisopropyl)+	REQ		
				Naphthalene	REQ						
				2-Methylnaphthalene	REQ			Pest/PCB - PP Scan		Water-Total	
				2-Chloronaphthalene	REQ			Result	Units		
				3,3'-Dichlorobenzidine	REQ			4,4'-DDT	0.003U	ug/l	
				2-Methylphenol	REQ			Chlordane	0.003U	ug/l	
				1,2-Dichlorobenzene	REQ			gamma-BHC (Lindane)	0.003U	ug/l	
				o-Chlorophenol	REQ			Dieldrin	0.003U	ug/l	
				2,4,5-Trichlorophenol	REQ			Endrin	0.003U	ug/l	
				Nitrobenzene	REQ			Methoxychlor	0.006U	ug/l	
				3-Nitroaniline	REQ			4,4'-DDD	0.003U	ug/l	
				4-Nitroaniline	REQ			4,4'-DDE	0.003U	ug/l	
				4-Nitrophenol	REQ			Heptachlor	0.003U	ug/l	
				Benzyl Alcohol	REQ			Aldrin	0.003U	ug/l	
				4-Bromophenyl-phenylet+	REQ			alpha-BHC	0.003U	ug/l	
				2,4-Dimethylphenol	REQ			beta-BHC	0.003U	ug/l	
				4-Methylphenol	REQ			delta-BHC	0.003U	ug/l	
				1,4-Dichlorobenzene	REQ			alpha-Endosulfan	0.003U	ug/l	
				4-Chloroaniline	REQ			Heptachlor epoxide	0.003U	ug/l	
				Phenol	REQ			Endosulfan sulfate	0.003U	ug/l	
				bis(2-Chloroethyl)Ether	REQ			Endrin aldehyde	0.003U	ug/l	
				bis(2-Chloroethoxy)Met+	REQ			Toxaphene	0.09U	ug/l	
				BIS(2-ETHYLHEXYL) PHTH+	REQ			PCB - 1260	0.03U	ug/l	
				Di-n-Octyl Phthalate	REQ			PCB - 1254	0.03U	ug/l	
				Hexachlorobenzene	REQ			PCB - 1221	0.03U	ug/l	
				Anthracene	REQ			PCB - 1232	0.03U	ug/l	
				1,2,4-Trichlorobenzene	REQ			PCB - 1248	0.03U	ug/l	
				2,4-Dichlorophenol	REQ			PCB - 1016	0.03U	ug/l	
				2,4-Dinitrotoluene	REQ			beta-Endosulfan	0.003U	ug/l	
				Pyrene	REQ			PCB - 1242	0.03U	ug/l	
				Dimethylphthalate	REQ			IntStd: Hexabromobenze+	84	% Recov	
				Dibenzofuran	REQ			IntStd: 4,4-Dibromoocct+	53	% Recov	
				Benzo(ghi)perylene	REQ						
				Indeno(1,2,3-cd)pyrene	REQ						
				Benzo(b)fluoranthene	REQ						
				Fluoranthene	REQ						
				Benzo(k)fluoranthene	REQ						
				Acenaphthylene	REQ						

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Washington State Department of Ecology
Sample/Project Analysis Results

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428026

Description: EAST

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Contract Lab Program		Water-Total	
		Result	Units
VOA	GC/MS	REQ	CLP

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Laboratory: Ecology, Manchester

Sample No: 89 428027

Description: TRANSPOR

Source: Well (Drinking Water Supply)

Begin Date: 89/10/16 :

Metals - PP				Water-Total		B/N/Acid Scan				Water-Total		B/N/Acid Scan				Water-Total					
				Result	Units	*** Continued ***				Result	Units					Result	Units				
Arsenic	As-Total			REQ	ug/l	2-Nitrophenol				REQ		bis(2-Chloroisopropyl)+				REQ					
Lead	Pb-Total			REQ	ug/l	Naphthalene				REQ		Pest/PCB - PP Scan									
Thallium	Tl-Total			REQ	ug/l	2-Methylnaphthalene				REQ		4,4'-DDT				0.003U	ug/l				
Nickel	Ni-Total			REQ	ug/l	2-Chloronaphthalene				REQ		Chlordane				0.003U	ug/l				
Silver	Ag-Total			REQ	ug/l	3,3'-Dichlorobenzidine				REQ		gamma-BHC (Lindane)				0.003U	ug/l				
Antimony	Sb-Total			REQ	ug/l	2-Methylphenol				REQ		Dieldrin				0.003U	ug/l				
Selenium	Se-Total			REQ	ug/l	1,2-Dichlorobenzene				REQ		Endrin				0.003U	ug/l				
Mercury	Hg-Total			REQ	ug/l	o-Chlorophenol				REQ		Methoxychlor				0.006U	ug/l				
						2,4,5-Trichlorophenol						REQ		4,4'-DDD						0.003U	ug/l
						Nitrobenzene						REQ		4,4'-DDE						0.003U	ug/l
						3-Nitroaniline						REQ		Heptachlor						0.003U	ug/l
						4-Nitroaniline						REQ		Aldrin						0.003U	ug/l
						4-Nitrophenol						REQ		alpha-BHC						0.003U	ug/l
						Benzyl Alcohol						REQ		beta-BHC						0.003U	ug/l
						4-Bromophenyl-phenylet+						REQ		delta-BHC						0.003U	ug/l
						2,4-Dimethylphenol						REQ		alpha-Endosulfan						0.003U	ug/l
						4-Methylphenol						REQ		Heptachlor epoxide						0.003U	ug/l
						1,4-Dichlorobenzene						REQ		Endosulfan sulfate						0.003U	ug/l
						4-Chloroaniline						REQ		Endrin aldehyde						0.003U	ug/l
						Phenol						REQ		Toxaphene						0.09U	ug/l
						bis(2-Chloroethyl)Ether						REQ		PCB - 1260						0.03U	ug/l
						bis(2-Chloroethoxy)Met+						REQ		PCB - 1254						0.03U	ug/l
						BIS(2-ETHYLHEXYL) PHTH+						REQ		PCB - 1221						0.03U	ug/l
						Di-n-Octyl Phthalate						REQ		PCB - 1232						0.03U	ug/l
						Hexachlorobenzene						REQ		PCB - 1248						0.03U	ug/l
						Anthracene						REQ		PCB - 1016						0.03U	ug/l
						1,2,4-Trichlorobenzene						REQ		beta-Endosulfan						0.003U	ug/l
						2,4-Dichlorophenol						REQ		PCB - 1242						0.03U	ug/l
						2,4-Dinitrotoluene						REQ		IntStd: Hexabromobenze+						90	% Recov
						Pyrene						REQ		IntStd: 4,4-Dibromoocst+						56	% Recov
						Dimethylphthalate						REQ									
						Dibenzofuran						REQ		Contract Lab Program							
						Benzo(ghi)perylene						REQ		Water-Total							
						Indeno(1,2,3-cd)pyrene						REQ		Result Units							
						Benzo(b)fluoranthene						REQ									
						Fluoranthene						REQ		VOA							
						Benzo(k)fluoranthene						REQ		GC/MS							
						Acenaphthylene						REQ		REQ							
						Chrysene						REQ		CLP							
						4,6-Dinitro-2-methylph+						REQ									
						1,3-Dichlorobenzene						REQ									
						2,6-Dinitrotoluene						REQ									
						N-Nitroso-di-n-Propyla+						REQ									
						4-Chlorophenyl-phenyle+						REQ									

(Sample Complete)

Project: DOE-008I TOFTDAHL DRUM SITE

Officer: LZC

Account: D3P01

Blank ID: BW9292

Pest/PCB - PP Scan Blank #1	Water-Total Result	Units
4,4'-DDT	0.010U	ug/l
Chlordane	0.010U	ug/l
gamma-BHC (Lindane)	0.010U	ug/l
Dieldrin	0.010U	ug/l
Endrin	0.010U	ug/l
Methoxychlor	0.020U	ug/l
4,4'-DDD	0.010U	ug/l
4,4'-DDE	0.010U	ug/l
Heptachlor	0.010U	ug/l
Aldrin	0.010U	ug/l
alpha-BHC	0.010U	ug/l
beta-BHC	0.010U	ug/l
delta-BHC	0.010U	ug/l
alpha-Endosulfan	0.010U	ug/l
Heptachlor epoxide	0.010U	ug/l
Endosulfan sulfate	0.010U	ug/l
Endrin aldehyde	0.010U	ug/l
Toxaphene	0.90U	ug/l
PCB - 1260	0.10U	ug/l
PCB - 1254	0.10U	ug/l
PCB - 1221	0.10U	ug/l
PCB - 1232	0.10U	ug/l
PCB - 1248	0.10U	ug/l
PCB - 1016	0.10U	ug/l
beta-Endosulfan	0.010U	ug/l
PCB - 1242	0.10U	ug/l
IntStd: Hexabromobenze+	80	% Recov
IntStd: 4,4-Dibromooct+	38	% Recov

(Sample Complete)

WASHINGTON STATE DEPARTMENT OF ECOLOGY
MANCHESTER ENVIRONMENTAL LABORATORY
P.O. Box 307, Manchester, WA 98353

DATA REVIEW

February 13, 1990

PROJECT: Toftdahl
SAMPLE NO: 428020 - 428027 PP Metals
LABORATORY: Columbia Analytical
1317 S. 13th Avenue
Kelso, WA 98626
By: *Craig Smith* Smith, Chemist

Metals

Holding time: Analyses for all parameters were performed within the holding time limits.

Reagent Blank: The reagent blank for water showed no detectable analytes for the desired metals.

Matrix Spike: The targeted accuracy of matrix spikes is +/- 25% of the true value.
All values were within the specified limits.

Laboratory Control Sample: The target is a +/- 20% recovery control limit.

Sample Duplicate: The target limits are +/- 20%, or +/- 1 detection limit. Duplicate results were within the target control limits.

Sample Data: The data is acceptable for use without further qualification.

Mercury Results

	Sample Number	Result (ug/L)
<i>Boone</i>	428020	0.060 U
<i>Jam</i>	428021	0.060 U
<i>Bedoff</i>	428022	0.060 U
<i>Kyle</i>	428023	0.10
<i>Honala</i>	428024	0.16
<i>Ginter</i>	428025	0.060 U
<i>East</i>	428026	0.060 U
<i>Transport</i>	428027	0.22
	428021 spike (1.0ppb)	100% recovery
	428021 dup spike	106% recovery

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

Total Priority Pollutant Metals
 mg/L

Sample Name:			<i>Down</i>	<i>Tom</i>	<i>Bed's ff</i>
Lab Code:			428020	428021	428022
			<u>225-1</u>	<u>225-2</u>	<u>225-3</u>
	<u>Method</u>	<u>MRL</u>			
Antimony	200.7	0.05	ND	ND	ND
Arsenic	206.2	0.005	ND	ND	ND
Beryllium	200.7	0.005	ND	ND	ND
Cadmium	200.7	0.002	ND	ND	ND
Chromium	200.7	0.005	ND	ND	ND
Copper	200.7	0.01	0.05	0.01	0.05
Lead	239.2	0.002	ND	ND	ND
Nickel	200.7	0.02	ND	ND	ND
Selenium	270.2	0.005	ND	ND	ND
Silver	200.7	0.01	ND	ND	ND
Thallium	279.1	0.005	ND	ND	ND
Zinc	200.7	0.01	0.29	0.01	ND

ND means None Detected at or above MRL
 MRL means Method Reporting Limit

Approved by Mike Shelton Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

Total Priority Pollutant Metals
 mg/L

Sample Name:			<i>Kyle</i>	<i>bonala</i>	<i>Ginter</i>
Lab Code:			428023	428024	428025
			<u>225-4</u>	<u>225-5</u>	<u>225-6</u>
	<u>Method</u>	<u>MRL</u>			
Antimony	200.7	0.05	ND	ND	ND
Arsenic	206.2	0.005	ND	ND	ND
Beryllium	200.7	0.005	ND	ND	ND
Cadmium	200.7	0.002	ND	ND	ND
Chromium	200.7	0.005	ND	ND	ND
Copper	200.7	0.01	0.03	ND	ND
Lead	239.2	0.002	ND	ND	ND
Nickel	200.7	0.02	ND	ND	ND
Selenium	270.2	0.005	ND	ND	ND
Silver	200.7	0.01	ND	ND	ND
Thallium	279.1	0.005	ND	ND	ND
Zinc	200.7	0.01	0.02	0.02	ND

ND means None Detected at or above MRL
 MRL means Method Reporting Limit

Approved by

Mike Shelton

Date

2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

Total Priority Pollutant Metals
 mg/L

Sample Name:			<i>East</i>	<i>Transport</i>
Lab Code:			428026	428027
	<u>Method</u>	<u>MRL</u>	<u>225-7</u>	<u>225-8</u>
Antimony	200.7	0.05	ND	ND
Arsenic	206.2	0.005	ND	ND
Beryllium	200.7	0.005	ND	ND
Cadmium	200.7	0.002	ND	ND
Chromium	200.7	0.005	ND	ND
Copper	200.7	0.01	ND	ND
Lead	239.2	0.002	ND	ND
Nickel	200.7	0.02	ND	ND
Selenium	270.2	0.005	ND	ND
Silver	200.7	0.01	ND	ND
Thallium	279.1	0.005	ND	ND
Zinc	200.7	0.01	0.02	ND

ND means None Detected at or above MRL
 MRL means Method Reporting Limit

Approved by 177 Mike Shelton Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

QA/QC Report
 Matrix Spike Results
 Total Priority Pollutants Metals
 mg/L

Sample Name: 428020
 Lab Code: 225-1MS

<u>Element</u>	<u>Spike Level</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Spike Result</u>	<u>% Recovery</u>
Antimony	0.5	0.05	ND	0.52	104
Arsenic	0.04	0.005	ND	0.041	103
Beryllium	0.05	0.005	ND	0.053	106
Cadmium	0.05	0.002	ND	0.059	118
Chromium	0.2	0.005	ND	0.216	108
Copper	0.25	0.01	0.05	0.29	96
Lead	0.02	0.002	ND	0.017	85
Nickel	0.5	0.02	ND	0.53	106
Selenium	0.01	0.005	ND	0.009	90
Silver	0.05	0.01	ND	0.044	88
Thallium	0.05	0.005	ND	0.048	96
Zinc	0.5	0.01	0.29	0.81	104

ND means None Detected at or above MRL
 MRL means Method Reporting Limit

Approved by Mike Shelton Date 2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

QA/QC Report
 Duplicate Matrix Spike Results
 Total Priority Pollutants Metals
 mg/L

Sample Name: 428020
 Lab Code: 225-1DMS

<u>Element</u>	<u>Spike Level</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Spike Result</u>	<u>% Recovery</u>
Antimony	0.5	0.05	ND	0.51	102
Arsenic	0.04	0.005	ND	0.041	103
Beryllium	0.05	0.005	ND	0.053	106
Cadmium	0.05	0.002	ND	0.059	118
Chromium	0.2	0.005	ND	0.213	106
Copper	0.25	0.01	0.05	0.29	96
Lead	0.02	0.002	ND	0.017	85
Nickel	0.5	0.02	ND	0.53	106
Selenium	0.01	0.005	ND	0.009	90
Silver	0.05	0.01	ND	0.045	95
Thallium	0.05	0.005	ND	0.049	98
Zinc	0.5	0.01	0.29	0.81	104

ND means None Detected at or above MRL
 MRL means Method Reporting Limit

Approved by

Mike Shelton

Date

2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

CLIENT: Washington State/Dept. of Ecology
 SUBMITTED BY: Craig Smith
 PROJECT: Toftdahl
 SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
 WORK ORDER #: K90225

LCSW Metals
 mg/L

Sample Name:
 Lab Code:

	<u>Method</u>	<u>MRL</u>	<u>True</u>	<u>Found</u>	<u>% Recovery</u>
Antimony	200.7	0.05	0.98	1.06	108
Arsenic	206.2	0.005	0.094	0.099	105
Beryllium	200.7	0.005	0.483	0.472	98
Cadmium	200.7	0.002	0.502	0.501	100
Chromium	200.7	0.005	0.510	0.503	99
Copper	200.7	0.01	0.52	0.49	94
Lead	239.2	0.002	0.098	0.086	88
Nickel	200.7	0.02	0.48	0.48	100
Selenium	270.2	0.005	0.208	0.196	94
Silver	200.7	0.01	0.50	0.49	98
Thallium	279.1	0.005	0.097	0.095	98
Zinc	200.7	0.01	3.10	2.94	95

MRL means Method Reporting Limit

Approved by

Mike Shelton

Date

2/8/90

COLUMBIA ANALYTICAL SERVICES, INC.

CLIENT: Washington State/Dept. of Ecology
SUBMITTED BY: Craig Smith
PROJECT: Toftdahl
SAMPLE DESCRIPTION: Water

DATE RECEIVED: 01/23/90
WORK ORDER #: K90225

QA/QC Report
Method Blank Summary
Total Priority Pollutant Metals
mg/L

Sample Name:

	<u>Method</u>	<u>MRL</u>	<u>Method Blank</u>
Antimony	200.7	0.05	ND
Arsenic	206.2	0.005	ND
Beryllium	200.7	0.005	ND
Cadmium	200.7	0.002	ND
Chromium	200.7	0.005	ND
Copper	200.7	0.01	ND
Lead	239.2	0.002	ND
Nickel	200.7	0.02	ND
Selenium	270.2	0.005	ND
Silver	200.7	0.01	ND
Thallium	279.1	0.005	ND
Zinc	200.7	0.01	ND

ND means None Detected at or above MRL
MRL means Method Reporting Limit

Approved by Mike Shelton Date 2/8/90

Transaction #: 10230940 Seq #: 01 (10) Gen Inorg/Phys-Specified
(WE) Ecology, Manchester Lab
Project: (DOE-008I) TOFTDAHL DRUM SITE 27A42 LZC
Parameter: (720 S) Cyanide Total mg/l

Partial

QA Code: () Normal Data
Instrument: (TECH-2) Technicon (AAII) General
Method: (EP1-335.3) Cyanide, (Total), Colorimetric, Automated
Chemist: (CGT) Tupas, Cyma DOE Hours Worked:
Lab Prep: () Unspecified
Matrix: (10) Water-Total Date Preprd:
Units: (10) mg/l Date Analyzd: 891017

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	89 428020	0.002U	BOONE	891016 (1)
2	89 428021	0.002U	TOM	891016 (1)
3	89 428022	0.002U	BEDOFF	891016 (1)
4	89 428023	0.002U	KYLE	891016 (1)
5	89 428024	0.002U	HOMALA	891016 (1)
6	89 428026	0.002U	EAST	891016 (1)

Record Type: TRNIN2 Date Verified: 10/23/89 By: [Signature]
Transaction Status: New Transaction...First Printing...Unverified.
Processed: 23-OCT-89 09:43:19 Status: N Batch: (In CUR DB)