



July 28, 2004

U. S. Army Engineer District, Nashville  
ATTN: CELRN-EP-R-M (Linda Ingram)  
110 Ninth Avenue South  
U.S. Court House Annex  
Nashville, TN 37203

**Submittal of Chemical Quality Assurance Report for the Groundwater Investigation,  
Plum Brook Ordnance Works, Sandusky, Ohio,  
Contract Number DACA62-00-D-0002**

Dear Mrs. Ingram:

As required by the Scope of Work (SOW) for contract number DACA62-00-D-0002, enclosed is the Chemical Quality Assurance Report (CQAR) for the Plum Brook Ordnance Works (PBOW). DataChek prepared the CQAR. DataChek followed the requirements outlined in the USACE document EM-200-1-6 *Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects*. The report is based on an evaluation of the groundwater data collected in September 2003.

If you have any questions or require additional information regarding this submittal, please call me at (865) 560-5271.

Sincerely,

A handwritten signature in cursive script that reads "Maureen F. McMyler".

Maureen F. McMyler  
Project Chemist

Enclosure

cc: Project file

**Chemical Quality Assurance Report**  
**Quarterly Groundwater Monitoring**  
**Plum Brook Ordnance Works**  
**Sandusky, Ohio**

**Prepared for the Shaw Group**

**By**

**DataChek**



**November 23, 2003**

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**Chemical Quality Assurance Report  
Quarterly Groundwater Monitoring – September 2003  
Plum Brook Ordnance Works, Sandusky, Ohio**

**1.0 Executive Summary**

The purpose of the Chemical Quality Assurance Report (CQAR) is to provide a comprehensive review of the quality of the chemical data associated with the groundwater monitoring program for the Plum Brook Ordnance Works. The former PBOW site is currently owned by NASA and is operated as the Plum Brook Station (PBS) of the NASA John Glenn Research Center, which is located at Lewis Field based in Cleveland, Ohio. It is located approximately 4 miles south of Sandusky, Ohio, and 59 miles west of Cleveland. The areas surrounding PBOW are mostly agricultural and residential. Public access is restricted at PBOW except during the annual deer hunting season.

The PBOW site was built in early 1941 as a manufacturing plant for 2,4,6-TNT, dinitrotoluene (DNT), and pentolite. Production of explosives began on December 16, 1941 and continued until 1945. It is estimated that more than one billion pounds of explosives were manufactured during the 4-year operating period. Decontamination of TNT, acid, pentolite, and DNT processing lines was completed in late 1945.

Based on review of historical use of the site and findings of previous investigations, potential contaminants in the groundwater at PBOW may include nitroaromatic compounds, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), and metals. The analytical objective of the groundwater investigation is to produce data of known quality that can be used for several purposes. The data will be used to determine if hazardous substances are present at the site at concentrations that may constitute unacceptable risk to human health or the environment, determine the nature and extent of source areas, and determine whether contaminant distribution is consistent with DOD activities.

The CQAR for the Plum Brook Ordnance Works (PBOW) quarterly groundwater monitoring has been prepared using a single set of a project sample, field quality assurance (QA) sample (field duplicate) and quality control (QC) sample (field split).

Samples used in the preparation of the QCAR are listed in Table 1. The analyte groups and analytical methods are provided below:

Parameter (Method)
Volatile Organics by GC/MS SW846 8260B
Explosives by SW846, 8330
Semivolatile Organics by SW846 8270C
Metals by SW846 6010B, 7470A

**Table 1: Samples Used in Preparation of the CQAR**

LOCATION	SAMPLE NO	SAMPLE DATE	PURPOSE	SDG	ANALYTICAL LAB
PBOW	DC3003	18-Sep-03	REG	PB044	STL
	DC3006		FD	PB044	STL
	DC3007		FS	F19588	Accutest

Two laboratories provided the analysis of the project samples and the associated laboratory QA/QC used in arriving at the results. Severn Trent Services (STL), Knoxville, TN analyzed both the project sample and the field QA sample (field duplicate), and Accutest Laboratories, Orlando, Florida analyzed the field QC sample (field split).

*Sensitivity:* All samples were analyzed within the designated holding times and preservatives were added to the samples.

*Precision:* The variability between the project sample, field QA and field QC are summarized in Tables 2-5. The criteria for comparing the project samples and the QA/QC samples conforms to the levels defined in Table 6. A total of 63 comparisons for 21 different compounds or elements were made and five (7.9%) of the sample pairs were designated as disagreement and four (6.3%) as major disagreement. Two of the four sample results with major disagreement resulted from comparing samples with detects to samples with no detects.

*Accuracy:* The analyte groups may contain false positives or be biased high because of method and/or trip blank contamination. In the metals, thallium was present in the method blank and in the project and field QA samples and was qualified as “B”.

*Completeness:* No data were rejected

*Comparability:* All of the analytical laboratories used the same method to analyze the samples. As a result all sample data can accurately be compared and analyzed.

## **2.0 Review of Project Samples, Field QA Samples, & Field QC Samples**

The sample data were evaluated following the logic identified in *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (February 1994) and *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (October 1999). Blank evaluation followed *USEPA Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses* (April 1993) and *Region III Modifications to National Functional Guidelines for Organic Data Review, Multi-Media, Multi-Concentration* (September 1994). Overall, the quality of the data was determined to be acceptable. Acceptable results were qualified as appropriate.

Several sample results for the organic compounds were assigned “J” qualifiers by the laboratory, which is standard practice for these methods, because they were quantitated between the method detection limit (MDL) and the reporting limit (RL). Due to the uncertainty associated with this region of quantitation, the validation reviewer retained the “J” qualifiers assigned by the laboratory to indicate an estimated quantity.

Data validation summaries (Attachment 1), which function as worksheets for the validation task, are included for each parameter in each data package. The following section highlights the key findings of the data validation for each analysis.

### **2.1 Analysis-Specific Data Validation Summaries**

#### **2.1.1 Volatile Organics by SW846 8260B**

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

**Holding Times/Sample Condition.** All samples were preserved correctly and analyzed within the QC holding time limit.

**Initial Calibration (ICAL) and Continuing Calibration (CCAL).** All initial and continuing calibrations associated with the project sample met QC criteria.

**Blanks.** No contaminants were found in the associated method blanks (MB) and trip blanks (TB).

**Surrogate Recoveries.** All surrogate recoveries were within the laboratory QC limits. No qualifiers were required.

**Matrix Spike/Matrix Spike Duplicate (MS/MSD).** The MS/MSD analyses were performed and all results were acceptable.

**Laboratory Control Sample (LCS).** LCS analyses were performed and QC criteria were met.

**Internal Standards (IS).** All internal standards area count recovery and retention times were met.

**Field Duplicates (FD).** All compounds in the project sample were nondetects. All field duplicate analyses were within QC limits.

**Quantitation.** All results were reported as reported.

### **2.1.2 Explosives by SW846-8330**

Overall, the data are of good quality. Data were reviewed for the following:

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. Samples were acceptable as received.

**Initial and Continuing Calibration.** All initial and continuing calibration relative response factors (RRFs) associated with the project sample met QC criteria. No qualifiers were required.

**Blanks.** No contaminants were found in the associated method blanks.

**Surrogate Recoveries.** All surrogate recoveries were within laboratory QC limits.

**Matrix Spike/Matrix Spike Duplicates (MS/MSD).** The MS/MSD analyses results were within limits for DC3003 and DC3006 and no qualifiers were required. The MS/MSD associated with DC3007 had high recoveries for RDX but all sample results were nondetect and no qualifiers were required.

**Laboratory Control Sample (LCS).** The explosives recoveries in the LCS analyses were within the QC limits and no qualifiers were required.

**Quantitation.** The sample results were acceptable as reported.

### **2.1.3 Semivolatile Organics by SW846 8270C**

Overall, the data are of good quality with the exceptions noted below. Data were reviewed for the following:

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples.

**Initial and Continuing Calibration.** All initial and continuing calibration RRFs associated with the project sample met QC criteria. No compound results were rejected.

**Blanks.** No compounds were detected in the method blanks. No qualifiers were required.

**Surrogate Recoveries.** All surrogate recoveries are within the laboratory QC limits.

**Matrix Spike/Matrix Spike Duplicate (MS/MSD).** The MS/MSD analyses were acceptable within QC limits.

**Laboratory Control Sample (LCS).** LCS analyses were performed and all results were acceptable.

**Internal Standards (IS).** Internal standards analyses were within the +100, -50% laboratory criteria.

**Quantitation.** All results were nondetects.

**2.1.4 Metals (Total and Dissolved) by SW846 6010B; Hg by Cold Vapor 7470A**

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples.

**Initial and Continuing Calibrations.** All initial and continuing calibrations associated with the project sample met QC criteria.

**Blanks.** The 5X rule for contaminants found in the associated calibration, prep, and method blanks (MB) was applied to all sample results. All were acceptable except the following:

Sample Type	Samples Affected	Analyte/Analytes	Blank	Validation Qualifier
Project Sample	DC3003T	thallium	MB	B
Field QA	DC3006T, DC3006D	thallium	MB	B

**Matrix Spike/Matrix Spike Duplicate(MS/MSD).** The MS/MSD recoveries were within the QC limits.

**ICP Check Samples.** The recoveries for the check samples were within the QC limits. No qualifiers were required.

**Laboratory Control Sample (LCS).** All the LCS had recoveries that met the QC limits. No qualifiers were required.

**ICP Serial Dilutions.** The serial dilution results were within the QC limits except for the following:

Sample Type	Samples Affected	Analyte / Analytes	Validation Qualifier
Field QC	DC3007T, DC3007D	barium, calcium, manganese	J

**Quantitation.** Results quantified between the minimum detection limit (MDL) and the reporting limit (RL), which the lab qualified as “B”, were qualified as estimated “J” unless blank contamination was present.

### **3.0 Review of Sample Handling**

All aspects of sample handling were reviewed as part of the sample data evaluation and recorded in each analysis-specific data validation summary. All chain of custody (COC) forms are available in Attachment 2. No major deficiencies were noted in the handling of the samples. All cooler temperatures were plainly identified as within the QC limit.

### **4.0 Data Comparison Tables**

Attachment 3 contains the complete project data set used to create the Comparison Tables. The data set lists all the appropriate samples, concentration units, detection limits, quantitation limits, and in the case of the metals, whether or not the sample was filtered. The detected compounds or elements were used to compare the project sample with the field QA and field QC samples.

All the detected analyte results are shown in Tables 2 through 5. In order to compare the project sample with both the field QA and field QC, compounds or elements detected in the project sample were listed for the corresponding samples as well, whether or not detected. Comparisons of results were categorized by agreement, disagreement or major disagreement as defined in Table 6. In the case of thallium the comparison between the PS/FD was labeled as a disagreement when the detect had been qualified as “B” (present in the method or trip blank). Since these compounds or elements may be biased high or a false positive, the comparison result could be overstated.

Data comparisons were appropriate in 63 cases for 21 different compounds or elements where at least one of the compounds or elements was present in one of the three samples. Application of the comparison criteria resulted in four major disagreements (MD) and five disagreements (D). Half of the major disagreements involved a situation where the compound was detected in one sample at levels below the reporting limit (qualified as “J”) and in one of the corresponding samples at below the detection level (qualified as “U”). The volatiles had two cases where the disagreement criteria was applied. Both of those involved compounds where one value was a nondetect. The carbon disulfide results were in disagreement between the PS and FD and a major disagreement between the FD and FS.

The semivolatiles and explosives had no comparisons. All compounds were nondetect in all three samples for both analytical groups.

Of the 20 instances where the comparison criteria was applied to the metals results, six involved comparisons where one value was a nondetect, and 14 where all values were detects. Three cases were categorized as major disagreements and four as disagreements. Two disagreements were between the PS/FD, one between the PS/FS and one between the FD/FS. Likewise, the major disagreements were one each between the PS/FD, PS/FS and FD/FS.

**Table 2: Data Comparison: Volatiles**

Location Code	Detected Analyte <sup>1</sup>	Project Sample Sample No/ Date Result/Qual/Code <sup>2</sup>	Field Duplicate Sample No./Date Result/Qual/Code <sup>2</sup>	Field Split Sample No./Date Result/Qual/Code <sup>2</sup>	PS/FD <sup>3</sup>	PS/FS <sup>3</sup>	FD/FS <sup>3</sup>
PBOW		DC3003 18-Sept-03	DC3006 18-Sept-03	DC3007 18-Sept-03			
	Carbon disulfide	1.0 U	0.11 J	12.0 U	D	A	MD

**Table 3: Data Comparison: Explosives**

Location Code	Detected Analyte <sup>1</sup>	Project Sample Sample No/ Date Result/Qual/Code <sup>2</sup>	Field Duplicate Sample No./Date Result/Qual/Code <sup>2</sup>	Field Split Sample No./Date Result/Qual/Code <sup>2</sup>	PS/FD <sup>3</sup>	PS/FS <sup>3</sup>	FD/FS <sup>3</sup>
PBOW		DC3003 18-Sept-03	DC3006 18-Sept-03	DC3007 18-Sept-03			
	No detected compounds						

**Table 4: Data Comparison: Semivolatiles**

Location Code	Detected Analyte <sup>1</sup>	Project Sample Sample No/ Date Result/Qual/Code <sup>2</sup>	Field Duplicate Sample No./Date Result/Qual/Code <sup>2</sup>	Field Split Sample No./Date Result/Qual/Code <sup>2</sup>	PS/FD <sup>3</sup>	PS/FS <sup>3</sup>	FD/FS <sup>3</sup>
PBOW		DC3003 18-Sept-03	DC3006 18-Sept-03	DC3007 18-Sept-03			
	No detected compounds						

**Table 5: Data Comparison: Metals**

Location Code	Detected Analyte <sup>1</sup>	Project Sample Sample No./Date Result/Qual/Code <sup>2</sup>	Field Duplicate Sample No./ Date Result/Qual/Code <sup>2</sup>	Field Split Sample No./Date Result/Qual/Code <sup>2</sup>	PS/FD <sup>3</sup>	PS/FS <sup>3</sup>	FD/FS <sup>3</sup>
PBOW		<b>DC3003</b> 18-Sept-03	<b>DC3006</b> 18-Sept-03	<b>DC3007</b> 18-Sept-03			
	Aluminum T	86.5 J	88.6 J	69 U	A	A	A
	Aluminum D	618 J	72.8 J	69 U	A	A	A
	Barium T	117 J	172 J	162 J, 13	A	A	A
	Barium D	177 J	174 J	167 J, 13	A	A	A
	Calcium T	159000	156000	151000 J, !3	A	A	A
	Calcium D	158000	157000	152000 J, 13	A	A	A
	Iron T	156	142	367	A	D	D
	Iron D	92.7 J	99.1 J	320	A	MD	MD
	Magnesium T	62000	60600	57500	A	A	A
	Magnesium D	61400	60500	57800	A	A	A
	Manganese T	72.9	70.9	65.1	A	A	A
	Manganese D	71.5	71.2	64.7	A	A	A
	Potassium T	12100	11800	12800 J, 13	A	A	A
	Potassium D	11900	11500	12800 J, 13	A	A	A
	Sodium T	120000	116000	115000	A	A	A
	Sodium D	118000	115000	115000	A	A	A
	Thallium T	3.1 B, 6a	8.3 B, 6a	3.3 U	D	A	A
	Thallium D	10 U	6.9 B, 6a	3.3 U	A	A	A
	Zinc T	4.8 J	20 U	8.0 U	D	A	A
	Zinc D	2.6 J	20 U	8.0 U	MD	A	A

**Footnotes in Tables 2, 3, 4, and 5**

- 1) Nondetected analyte results are provided in the Table for the purpose of establishing the basis for reporting the level of disagreement between the project and QA/QC samples. All results are reported in ug/l.
- 2) Result/Qual/Code: The Qual notation refers to the evaluator’s qualifier added to the analytical value resulting from a review of the lab QA/QC data. See **Table 7** for qualifier definitions. See **Table 8** for a listing of data validation codes.
- 3) Agreement (A)/Disagreement (D)/major disagreement (MD)-- the level of disagreement is based on comparison criteria from **Table 6**: PS=project sample; FD=field duplicate; FS=field split.

**Table 6: Criteria for Comparing Field QC and QA Sample Data**

Matrix	Parameter	Disagreement	Major Disagreement
All	All	>5x difference when one result is < DL	>10x difference when one result is < DL
All	All	>3x difference when one result is < RL	>5x difference when one result is < RL
Water	All except TPH	>2x difference	>3x difference

Reference: CRREL Special Report No. 96-9, “Comparison Criteria for Environmental Chemical Analyses of Split Samples Sent to Different Laboratories – Corps of Engineers Archived Data”, Grant, C.G., Jenkins, T.F., and Mudambi, A.R., USACE Cold Regions and Environmental Research Laboratory, Hanover NH, May 1996

**Table 7 : Validation Qualifiers**

- U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.
- J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
- B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).
- R The reported sample results are rejected due to the following:
  1. Severe deficiencies in the supporting quality control data.
  2. Anomalies noted in the sampling and/or analysis process that could affect the validity of the reported data.
  3. The presence or absence of the constituent cannot be verified based on the data provided.
  4. To indicate not to use a particular result in the event of a reanalysis.
- UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the “nondetect” may be inaccurate or imprecise. The nondetect result should be estimated.

**Table 8: Data Validation Reason Codes**

<b>Reason Code</b>	<b>Definition</b>
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

## **Attachment 1**

### **Data Validation Summaries**

SDG: PE044 / F19588 / 843656 Project: Quarter GW Mon. - CQAR  
Plumbrook

Method: Volatiles - 8260B Matrix/No. of Samples: Water-3

Validation Samples: DC 3003 - STL  
DC 3006 - STL  
DC 3007 - Accutest

### Data Validation Report Summary

	Status Code	Comments
1. Sample Preservation, Handling, and Transport	<u>A</u>	<u></u>
2. Chain of Custody	<u>A</u>	<u></u>
3. Holding Times	<u>A</u>	<u></u>
4. GC/MS Tune/Inst Perf	<u>A</u>	<u></u>
5. Calibrations	<u>A</u>	<u></u>
6. Blanks	<u>A</u>	<u></u>
7. Blank Spike/LCS	<u>A</u>	<u></u>
8. Matrix Spike	<u>A</u>	<u></u>
9. Surrogates	<u>A</u>	<u></u>
10. Internal Standards	<u>A</u>	<u></u>
11. Compound Identification	<u>A</u>	<u></u>
12. System Performance	<u>A</u>	<u></u>
13. Field QC Samples	<u>A</u>	<u></u>
14. Overall Assessment	<u>A</u>	<u></u>

Status Codes:

A = Acceptable

X = Data acceptable but qualified due to problems

R = Data Rejected



## SHAW E &amp; I INC

Client Sample ID: DC3003

## GC/MS Volatiles

Lot-Sample #...: H3I190201-002    Work Order #...: F0PVK1AN    Matrix.....: WATER  
 Date Sampled...: 09/18/03    Date Received...: 09/19/03  
 Prep Date.....: 09/22/03    Analysis Date...: 09/22/03  
 Prep Batch #...: 3265328  
 Dilution Factor: 1    Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING			MDL	Rev Qual
		LIMIT	UNITS			
Chloromethane	ND	2.0	ug/L	0.12	u	
Bromomethane	ND	2.0	ug/L	0.38		
Vinyl chloride	ND	1.0	ug/L	0.24		
Chloroethane	ND	2.0	ug/L	0.24		
Methylene chloride	ND	2.0	ug/L	0.23		
Acetone	ND	10	ug/L	1.4		
Carbon disulfide	ND	1.0	ug/L	0.10		
1,1-Dichloroethene	ND	1.0	ug/L	0.10		
1,1-Dichloroethane	ND	1.0	ug/L	0.10		
1,2-Dichloroethene	ND	1.0	ug/L	0.20		
(total)						
Chloroform	ND	1.0	ug/L	0.10		
1,2-Dichloroethane	ND	1.0	ug/L	0.10		
2-Butanone	ND	5.0	ug/L	0.75		
1,1,1-Trichloroethane	ND	1.0	ug/L	0.10		
Carbon tetrachloride	ND	1.0	ug/L	0.12		
Bromodichloromethane	ND	1.0	ug/L	0.10		
1,2-Dichloropropane	ND	1.0	ug/L	0.10		
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.10		
Trichloroethene	ND	1.0	ug/L	0.10		
Dibromochloromethane	ND	1.0	ug/L	0.20		
1,1,2-Trichloroethane	ND	1.0	ug/L	0.25		
Benzene	ND	1.0	ug/L	0.10		
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.11		
Bromoform	ND	1.0	ug/L	0.14		
4-Methyl-2-pentanone	ND	5.0	ug/L	0.40		
2-Hexanone	ND	5.0	ug/L	0.76		
Tetrachloroethene	ND	1.0	ug/L	0.10		
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.15		
Toluene	ND	1.0	ug/L	0.10		
Chlorobenzene	ND	1.0	ug/L	0.10		
Ethylbenzene	ND	1.0	ug/L	0.10		
Styrene	ND	1.0	ug/L	0.10		
Xylenes (total)	ND	1.0	ug/L	0.30		

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Dibromofluoromethane	96	(79 - 120)
1,2-Dichloroethane-d4	100	(71 - 127)
Toluene-d8	98	(80 - 120)
Bromofluorobenzene	95	(69 - 126)

SHAW E & I INC

Client Sample ID: DC3006

GC/MS Volatiles

Lot-Sample #...: H3I190201-004    Work Order #...: F0PV71AN    Matrix.....: WATER  
 Date Sampled...: 09/18/03    Date Received...: 09/19/03  
 Prep Date.....: 09/22/03    Analysis Date...: 09/22/03  
 Prep Batch #...: 3265328  
 Dilution Factor: 1    Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL	Rev Qual
Chloromethane	ND	2.0	ug/L	0.12	u
Bromomethane	ND	2.0	ug/L	0.38	
Vinyl chloride	ND	1.0	ug/L	0.24	
Chloroethane	ND	2.0	ug/L	0.24	
Methylene chloride	ND	2.0	ug/L	0.23	
Acetone	ND	10	ug/L	1.4	
<b>Carbon disulfide</b>	<b>0.11 J</b>	<b>1.0</b>	<b>ug/L</b>	<b>0.10</b>	J
1,1-Dichloroethene	ND	1.0	ug/L	0.10	u
1,1-Dichloroethane	ND	1.0	ug/L	0.10	
1,2-Dichloroethene (total)	ND	1.0	ug/L	0.20	
Chloroform	ND	1.0	ug/L	0.10	
1,2-Dichloroethane	ND	1.0	ug/L	0.10	
2-Butanone	ND	5.0	ug/L	0.75	
1,1,1-Trichloroethane	ND	1.0	ug/L	0.10	
Carbon tetrachloride	ND	1.0	ug/L	0.12	
Bromodichloromethane	ND	1.0	ug/L	0.10	
1,2-Dichloropropane	ND	1.0	ug/L	0.10	
cis-1,3-Dichloropropene	ND	1.0	ug/L	0.10	
Trichloroethene	ND	1.0	ug/L	0.10	
Dibromochloromethane	ND	1.0	ug/L	0.20	
1,1,2-Trichloroethane	ND	1.0	ug/L	0.25	
Benzene	ND	1.0	ug/L	0.10	
trans-1,3-Dichloropropene	ND	1.0	ug/L	0.11	
Bromoform	ND	1.0	ug/L	0.14	
4-Methyl-2-pentanone	ND	5.0	ug/L	0.40	
2-Hexanone	ND	5.0	ug/L	0.76	
Tetrachloroethene	ND	1.0	ug/L	0.10	
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	0.15	
Toluene	ND	1.0	ug/L	0.10	
Chlorobenzene	ND	1.0	ug/L	0.10	
Ethylbenzene	ND	1.0	ug/L	0.10	
Styrene	ND	1.0	ug/L	0.10	
Xylenes (total)	ND	1.0	ug/L	0.30	

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	95	(79 - 120)
1,2-Dichloroethane-d4	98	(71 - 127)
Toluene-d8	95	(80 - 120)
Bromofluorobenzene	95	(69 - 126)

(Continued on next page)

Report of Analysis

Client Sample ID: DC3007	Date Sampled: 09/18/03
Lab Sample ID: F19588-1	Date Received: 09/19/03
Matrix: AQ - Water	Percent Solids: n/a
Method: SW846 8260B	
Project: PBOW	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B017657.D	1	09/23/03	KW	n/a	n/a	VB777
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	Rev Qual
67-64-1	Acetone	ND	50	5.0	ug/l		u
71-43-2	Benzene	ND	1.0	0.50	ug/l		
75-27-4	Bromodichloromethane	ND	2.0	0.50	ug/l		
75-25-2	Bromoform	ND	2.0	0.50	ug/l		
108-90-7	Chlorobenzene	ND	2.0	0.50	ug/l		
75-00-3	Chloroethane	ND	2.0	1.0	ug/l		
67-66-3	Chloroform	ND	2.0	0.50	ug/l		
75-15-0	Carbon disulfide	ND	2.0	1.0	ug/l		
56-23-5	Carbon tetrachloride	ND	2.0	0.50	ug/l		
75-34-3	1,1-Dichloroethane	ND	2.0	0.50	ug/l		
75-35-4	1,1-Dichloroethylene	ND	2.0	0.50	ug/l		
107-06-2	1,2-Dichloroethane	ND	2.0	0.50	ug/l		
78-87-5	1,2-Dichloropropane	ND	2.0	0.50	ug/l		
124-48-1	Dibromochloromethane	ND	2.0	0.40	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	2.0	0.50	ug/l		
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.30	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	2.0	0.50	ug/l		
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.30	ug/l		
100-41-4	Ethylbenzene	ND	2.0	0.50	ug/l		
591-78-6	2-Hexanone	ND	10	2.5	ug/l		
108-10-1	4-Methyl-2-pentanone	ND	10	2.5	ug/l		
74-83-9	Methyl bromide	ND	2.0	1.0	ug/l		
74-87-3	Methyl chloride	ND	2.0	1.0	ug/l		
75-09-2	Methylene chloride	ND	5.0	1.0	ug/l		
78-93-3	Methyl ethyl ketone	ND	10	2.5	ug/l		
100-42-5	Styrene	ND	2.0	0.50	ug/l		
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.50	ug/l		
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.30	ug/l		
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.50	ug/l		
127-18-4	Tetrachloroethylene	ND	2.0	0.50	ug/l		
108-88-3	Toluene	ND	2.0	0.50	ug/l		
79-01-6	Trichloroethylene	ND	2.0	0.50	ug/l		

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DC3007	Date Sampled:	09/18/03
Lab Sample ID:	F19588-1	Date Received:	09/19/03
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	PBOW		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	Rw Qnd
75-01-4	Vinyl chloride	ND	1.0	0.50	ug/l		4
1330-20-7	Xylene (total)	ND	6.0	1.0	ug/l		4

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		86-115%
17060-07-0	1,2-Dichloroethane-D4	87%		78-125%
2037-26-5	Toluene-D8	97%		87-113%
460-00-4	4-Bromofluorobenzene	100%		84-117%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound



**DATA VALIDATION WORKSHEETS  
VOLATILE ORGANICS**

Reviewer: Kitchings Date 11/22  
 Project: Plumbrook SDG: 843656 / F19588  
-P3084 Matrix/No. Samples: W-3

<b>III. Initial Calibration</b>			
1. Were correct concentrations of standards used for initial calibration? Were samples analyzed within 12 hours of associated instrument performance check?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Were initial calibration RRFs for all volatile target compounds and system monitoring compounds $\geq 0.05$ ? Do recalculations for RRFs agree with reported values?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
3. Were %RSDs $\leq 30\%$ for all volatile target compounds? Do recalculations for RSDs agree with reported values?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
4. Were any qualifications required based on this information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> 9/16 @ 14:20 all w/i limits			

<b>IV. Continuing Calibration</b>			
1. Were continuing calibration samples run at the required frequency, and compared to the correct initial calibration?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Did calculations from raw data agree with laboratory reported values for RRF and %D?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
3. Were continuing calibration RRFs for volatile organic compounds and system monitoring compounds (surrogates) $\geq 0.05$ ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
4. Were %D between initial calibration RRF and the continuing calibration RRFs within $\pm 25\%$ ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
5. Were any qualifications required based on this information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> 9/22 @ 10:26 RRFs ✓ %D's ✓			

**DATA VALIDATION WORKSHEETS  
VOLATILE ORGANICS**

Reviewer: Kitchings Date 11/22

Project: Plumbrook SDG: 843656 / PB044 Matrix/No. Samples: W-3  
F19588

<b>V. Blanks</b>											
1. Were any target or non-target compounds reported in laboratory prep or calibration blanks?	Yes	<input checked="" type="radio"/> No	N/A								
2. Were method blank analyses performed at required frequency, and for each GC/MS system used to analyze samples for each type of analysis (i.e., matrix)?	<input checked="" type="radio"/> Yes	No	N/A								
3. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A								
<b>Comments/Qualifications:</b> <p align="center">9/22 MB - all U's.</p>											
<b>VI. System Monitoring Compounds (Surrogate Spikes)</b>											
1. Were laboratory surrogate recoveries calculated and reported correctly?	<input checked="" type="radio"/> Yes	No	N/A								
2. Were surrogate recoveries within acceptable limits?	<input checked="" type="radio"/> Yes	No	N/A								
3. Were any qualifications required based on surrogate spike QC information?	Yes	<input checked="" type="radio"/> No	N/A								
<b>Comments/Qualifications:</b> <p align="center">87-101 70's.</p>											
<b>VII. Matrix Spikes/Matrix Spike Duplicates</b>											
1. Were MS/MSD samples analyzed at required frequency for each sample matrix?	<input checked="" type="radio"/> Yes	No	N/A								
2. Were MS/MSD results for recovery and RPD within advisory limits?	<input checked="" type="radio"/> Yes	No	N/A								
3. Were Samples used for MS/MSD field blanks?	Yes	<input checked="" type="radio"/> No	N/A								
4. Were laboratory reported results correctly calculated from raw data?	Yes	No	<input checked="" type="radio"/> N/A								
5. Were any qualifications required, based on results of MS/MSD samples in conjunction with other QC information?	Yes	<input checked="" type="radio"/> No	N/A								
<b>Comments/Qualifications:</b> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">3003</td> <td style="width: 50%;">3007</td> </tr> <tr> <td>MS 83-93 2R</td> <td>79-117</td> </tr> <tr> <td>MSD 84-80 2R</td> <td>82-136</td> </tr> <tr> <td>RPD 0.9-6.7</td> <td>0-10</td> </tr> </table>				3003	3007	MS 83-93 2R	79-117	MSD 84-80 2R	82-136	RPD 0.9-6.7	0-10
3003	3007										
MS 83-93 2R	79-117										
MSD 84-80 2R	82-136										
RPD 0.9-6.7	0-10										

**DATA VALIDATION WORKSHEETS  
VOLATILE ORGANICS**

Reviewer: Kitchings Date 11/22

Project: Plumbrook SDG: F19588 / PB044  
843656 Matrix/No. Samples: w-3

VIII. Laboratory Control Sample (LCS)			
1. Were LCS samples run at correct frequency for each matrix samples?	<input checked="" type="radio"/> Yes	No	N/A
2. Were LCS calculations performed correctly, and did laboratory reported values match raw data? Were recoveries within laboratory QC limits?	<input checked="" type="radio"/> Yes	No	N/A
4. Were any qualifications required based on LCS data in conjunction with other QC information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> 9/22 LCS 81AC 86-88 2 9/19 LCS 81AC/AD 9 <sub>6</sub> RP 86-89 91-94 RPD - 3.7 - 7.2 9/22 - 86-120 9 <sub>6</sub> RP's - 82-137			
IX. Internal Standards			
1. Were standard area counts within a factor of two (-50% to +100%) from associated calibration standard?	<input checked="" type="radio"/> Yes	No	N/A
2. Were retention times of internal standard within + or - 30 seconds of retention time of associated calibration check?	<input checked="" type="radio"/> Yes	No	N/A
3. Were any qualifications required based on internal standard results?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> all IS's w/in limits			
X. Target Compound Identification			
1. Are relative retention times (RRTs) within + or - 0.06 RRT units of standard RRT?	Yes	No	<input checked="" type="radio"/> N/A
2. Do sample compound spectra meet specified criteria in relation to laboratory standard spectra?	Yes	No	N/A
3. Were all compounds accounted for on chromatogram?	Yes	No	N/A
<b>Comments/Qualifications:</b> No raw data			

**DATA VALIDATION WORKSHEETS  
VOLATILE ORGANICS**

Reviewer: Kitchings Date 11/22  
 Project: Plumbrook SDG: B43656 / P844 Matrix/No. Samples: W-3  
E19588

<b>XI. Compound Quantitation and Reported Contract Required Quantitation Limits (CRQLs)</b>			
1. Were sample results correctly calculated and reported by laboratory?	Yes	No	N/A
2. Were correct internal standard quantitation ion and RRF used to quantify all compounds for all samples?	Yes	No	N/A
3. Were CRQLs adjusted to reflect sample dilutions and dry weight factors not accounted for by the method?	Yes	No	N/A
4. Were any laboratory QA/QC sample results calculated from peaks derived using manual integration?	Yes	No	N/A
5. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b> <p align="center">No raw data - level III</p>			
<b>XII. Field QC</b>			
1. Were any Field Duplicates associated with this SDG?	Yes	No	N/A
a. If Yes, were RPDs acceptable (50% for water samples, 100% for soil samples)?	Yes	No	N/A
2. Were any field blanks or equipment rinsates associated with this SDG?	Yes	No	N/A
a. If yes, were any compounds reported in samples >IDL?	Yes	No	N/A
b. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b> <p>TB5001          @chlorom @ 0.24          TOL @ 0.17          smps @ u's</p> <p align="center">DR14      FD.          u      carb disulf      0.11</p>			
<b>XIII. Overall Assessment of Data</b>			
1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	No	N/A
<b>Comments/Qualifications:</b>			

Quantum GW Mon. - QAR

SDG: PB044 / F19588 Project: Plumbrook

Method: Semivolatiles - 8270 C Matrix/No. of Samples: Water-3

Validation Samples: DC3003 - STL  
DC3006 - STL  
DC3007 - Accutest

Data Validation Report Summary

	Status Code	Comments
1. Sample Preservation, Handling, and Transport	<u>A</u>	<u></u>
2. Chain of Custody	<u>A</u>	<u></u>
3. Holding Times	<u>A</u>	<u></u>
4. GC/MS Tune/Inst Perf	<u>A</u>	<u></u>
5. Calibrations	<u>A</u>	<u></u>
6. Blanks	<u>A</u>	<u></u>
7. Blank Spike/LCS	<u>A</u>	<u></u>
8. Matrix Spike	<u>A</u>	<u></u>
9. Surrogates	<u>A</u>	<u></u>
10. Internal Standards	<u>A</u>	<u></u>
11. Compound Identification	<u>A</u>	<u></u>
12. System Performance	<u>A</u>	<u></u>
13. Field QC Samples	<u>A</u>	<u></u>
14. Overall Assessment	<u>A</u>	<u></u>

Status Codes:

A = Acceptable

X = Data acceptable but qualified due to problems

R = Data Rejected



## SHAW E &amp; I INC

Client Sample ID: DC3003

## GC/MS Semivolatiles

Lot-Sample #....: H3I190201-002    Work Order #....: F0PVK1AP    Matrix.....: WATER  
 Date Sampled....: 09/18/03    Date Received...: 09/19/03  
 Prep Date.....: 09/22/03    Analysis Date...: 09/28/03  
 Prep Batch #....: 3265167  
 Dilution Factor: 1    Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL	Revised
Phenol	ND	10	ug/L	1.8	u
bis(2-Chloroethyl)- ether	ND	10	ug/L	1.6	
2-Chlorophenol	ND	10	ug/L	1.2	
1,3-Dichlorobenzene	ND	10	ug/L	1.6	
1,4-Dichlorobenzene	ND	10	ug/L	1.4	
1,2-Dichlorobenzene	ND	10	ug/L	1.7	
2-Methylphenol	ND	10	ug/L	2.0	
2,2'-oxybis(1-Chloro- propane)	ND	10	ug/L	1.4	
4-Methylphenol	ND	10	ug/L	3.6	
N-Nitrosodi-n-propyl- amine	ND	10	ug/L	2.1	
Hexachloroethane	ND	10	ug/L	1.9	
Nitrobenzene	ND	10	ug/L	1.8	
Isophorone	ND	10	ug/L	1.6	
2-Nitrophenol	ND	10	ug/L	2.4	
2,4-Dimethylphenol	ND	10	ug/L	3.7	
bis(2-Chloroethoxy) methane	ND	10	ug/L	1.5	
2,4-Dichlorophenol	ND	10	ug/L	2.0	
1,2,4-Trichloro- benzene	ND	10	ug/L	1.5	
Naphthalene	ND	10	ug/L	1.7	
4-Chloroaniline	ND	10	ug/L	1.8	
Hexachlorobutadiene	ND	10	ug/L	1.4	
4-Chloro-3-methylphenol	ND	10	ug/L	2.2	
2-Methylnaphthalene	ND	10	ug/L	1.6	
Hexachlorocyclopenta- diene	ND	50	ug/L	7.9	
2,4,6-Trichloro- phenol	ND	10	ug/L	2.0	
2,4,5-Trichloro- phenol	ND	10	ug/L	1.6	
2-Chloronaphthalene	ND	10	ug/L	1.6	
2-Nitroaniline	ND	50	ug/L	1.4	
Dimethyl phthalate	ND	10	ug/L	1.1	
Acenaphthylene	ND	10	ug/L	1.7	
2,6-Dinitrotoluene	ND	10	ug/L	1.7	

(Continued on next page)

SHAW E & I INC

Client Sample ID: DC3003

GC/MS Semivolatiles

Lot-Sample #....: H3I190201-002 Work Order #....: F0PVK1AP Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL	Req'd
3-Nitroaniline	ND	50	ug/L	1.3	u
Acenaphthene	ND	10	ug/L	1.5	
2,4-Dinitrophenol	ND	50	ug/L	15	
4-Nitrophenol	ND	50	ug/L	15	
Dibenzofuran	ND	10	ug/L	1.6	
2,4-Dinitrotoluene	ND	10	ug/L	1.6	
Diethyl phthalate	ND	10	ug/L	1.3	
4-Chlorophenyl phenyl ether	ND	10	ug/L	1.6	
Fluorene	ND	10	ug/L	1.3	
4-Nitroaniline	ND	50	ug/L	1.3	
4,6-Dinitro-2-methylphenol	ND	50	ug/L	11	
N-Nitrosodiphenylamine	ND	10	ug/L	1.6	
4-Bromophenyl phenyl ether	ND	10	ug/L	1.4	
Hexachlorobenzene	ND	10	ug/L	0.90	
Pentachlorophenol	ND	50	ug/L	8.6	
Phenanthrene	ND	10	ug/L	0.84	
Anthracene	ND	10	ug/L	0.83	
Carbazole	ND	10	ug/L	1.2	
Di-n-butyl phthalate	ND	10	ug/L	1.4	
Fluoranthene	ND	10	ug/L	1.3	
Pyrene	ND	10	ug/L	0.96	
Butyl benzyl phthalate	ND	10	ug/L	1.3	
3,3'-Dichlorobenzidine	ND	50	ug/L	1.2	
Benzo(a)anthracene	ND	10	ug/L	1.2	
Chrysene	ND	10	ug/L	0.98	
bis(2-Ethylhexyl) phthalate	ND	10	ug/L	2.2	
Di-n-octyl phthalate	ND	10	ug/L	2.4	
Benzo(b)fluoranthene	ND	10	ug/L	2.1	
Benzo(k)fluoranthene	ND	10	ug/L	1.7	
Benzo(a)pyrene	ND	10	ug/L	1.6	
Indeno(1,2,3-cd)pyrene	ND	10	ug/L	2.1	
Dibenz(a,h)anthracene	ND	10	ug/L	2.5	
Benzo(ghi)perylene	ND	10	ug/L	2.1	

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	71	(29 - 110)
Phenol-d5	75	(41 - 115)
Nitrobenzene-d5	83	(46 - 117)
2-Fluorobiphenyl	81	(44 - 116)
2,4,6-Tribromophenol	94	(31 - 138)
Terphenyl-d14	75	(36 - 134)

## SHAW E &amp; I INC

Client Sample ID: DC3006

## GC/MS Semivolatiles

Lot-Sample #....: H3I190201-004    Work Order #....: F0PV71AP    Matrix.....: WATER  
 Date Sampled....: 09/18/03    Date Received...: 09/19/03  
 Prep Date.....: 09/22/03    Analysis Date...: 09/28/03  
 Prep Batch #....: 3265167  
 Dilution Factor: 1    Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL	Rev Qual
Phenol	ND	10	ug/L	1.8	4
bis(2-Chloroethyl)- ether	ND	10	ug/L	1.6	4
2-Chlorophenol	ND	10	ug/L	1.2	
1,3-Dichlorobenzene	ND	10	ug/L	1.6	
1,4-Dichlorobenzene	ND	10	ug/L	1.4	
1,2-Dichlorobenzene	ND	10	ug/L	1.7	
2-Methylphenol	ND	10	ug/L	2.0	
2,2'-oxybis(1-Chloro- propane)	ND	10	ug/L	1.4	
4-Methylphenol	ND	10	ug/L	3.6	
N-Nitrosodi-n-propyl- amine	ND	10	ug/L	2.1	
Hexachloroethane	ND	10	ug/L	1.9	
Nitrobenzene	ND	10	ug/L	1.8	
Isophorone	ND	10	ug/L	1.6	
2-Nitrophenol	ND	10	ug/L	2.4	
2,4-Dimethylphenol	ND	10	ug/L	3.7	
bis(2-Chloroethoxy) methane	ND	10	ug/L	1.5	
2,4-Dichlorophenol	ND	10	ug/L	2.0	
1,2,4-Trichloro- benzene	ND	10	ug/L	1.5	
Naphthalene	ND	10	ug/L	1.7	
4-Chloroaniline	ND	10	ug/L	1.8	
Hexachlorobutadiene	ND	10	ug/L	1.4	
4-Chloro-3-methylphenol	ND	10	ug/L	2.2	
2-Methylnaphthalene	ND	10	ug/L	1.6	
Hexachlorocyclopenta- diene	ND	50	ug/L	7.9	
2,4,6-Trichloro- phenol	ND	10	ug/L	2.0	
2,4,5-Trichloro- phenol	ND	10	ug/L	1.6	
2-Chloronaphthalene	ND	10	ug/L	1.6	
2-Nitroaniline	ND	50	ug/L	1.4	
Dimethyl phthalate	ND	10	ug/L	1.1	
Acenaphthylene	ND	10	ug/L	1.7	
2,6-Dinitrotoluene	ND	10	ug/L	1.7	

(Continued on next page)

## SHAW E &amp; I INC

Client Sample ID: DC3006

## GC/MS Semivolatiles

Lot-Sample #....: H3I190201-004 Work Order #....: F0PV71AP Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL	Revised
3-Nitroaniline	ND	50	ug/L	1.3	u
Acenaphthene	ND	10	ug/L	1.5	
2,4-Dinitrophenol	ND	50	ug/L	15	
4-Nitrophenol	ND	50	ug/L	15	
Dibenzofuran	ND	10	ug/L	1.6	
2,4-Dinitrotoluene	ND	10	ug/L	1.6	
Diethyl phthalate	ND	10	ug/L	1.3	
4-Chlorophenyl phenyl ether	ND	10	ug/L	1.6	
Fluorene	ND	10	ug/L	1.3	
4-Nitroaniline	ND	50	ug/L	1.3	
4,6-Dinitro- 2-methylphenol	ND	50	ug/L	11	
N-Nitrosodiphenylamine	ND	10	ug/L	1.6	
4-Bromophenyl phenyl ether	ND	10	ug/L	1.4	
Hexachlorobenzene	ND	10	ug/L	0.90	
Pentachlorophenol	ND	50	ug/L	8.6	
Phenanthrene	ND	10	ug/L	0.84	
Anthracene	ND	10	ug/L	0.83	
Carbazole	ND	10	ug/L	1.2	
Di-n-butyl phthalate	ND	10	ug/L	1.4	
Fluoranthene	ND	10	ug/L	1.3	
Pyrene	ND	10	ug/L	0.96	
Butyl benzyl phthalate	ND	10	ug/L	1.3	
3,3'-Dichlorobenzidine	ND	50	ug/L	1.2	
Benzo(a)anthracene	ND	10	ug/L	1.2	
Chrysene	ND	10	ug/L	0.98	
bis(2-Ethylhexyl) phthalate	ND	10	ug/L	2.2	
Di-n-octyl phthalate	ND	10	ug/L	2.4	
Benzo(b)fluoranthene	ND	10	ug/L	2.1	
Benzo(k)fluoranthene	ND	10	ug/L	1.7	
Benzo(a)pyrene	ND	10	ug/L	1.6	
Indeno(1,2,3-cd)pyrene	ND	10	ug/L	2.1	
Dibenz(a,h)anthracene	ND	10	ug/L	2.5	
Benzo(ghi)perylene	ND	10	ug/L	2.1	

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Fluorophenol	63	(29 - 110)
Phenol-d5	68	(41 - 115)
Nitrobenzene-d5	79	(46 - 117)
2-Fluorobiphenyl	75	(44 - 116)
2,4,6-Tribromophenol	94	(31 - 138)
Terphenyl-d14	79	(36 - 134)

## Report of Analysis

Client Sample ID: DC3007	Date Sampled: 09/18/03
Lab Sample ID: F19588-1	Date Received: 09/19/03
Matrix: AQ - Water	Percent Solids: n/a
Method: SW846 8270C SW846 3510C	
Project: PBOW	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L019060.D	1	09/26/03	ME	09/23/03	OP8592	SL1025
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	Res Qual
65-85-0	Benzoic Acid	ND	24	15	ug/l		u
95-57-8	2-Chlorophenol	ND	4.9	1.9	ug/l		
59-50-7	4-Chloro-3-methyl phenol	ND	4.9	1.9	ug/l		
120-83-2	2,4-Dichlorophenol	ND	4.9	1.9	ug/l		
105-67-9	2,4-Dimethylphenol	ND	4.9	1.9	ug/l		
51-28-5	2,4-Dinitrophenol	ND	24	9.7	ug/l		
534-52-1	4,6-Dinitro-o-cresol	ND	9.7	7.3	ug/l		
95-48-7	2-Methylphenol	ND	4.9	1.9	ug/l		
	3&4-Methylphenol	ND	4.9	1.9	ug/l		
88-75-5	2-Nitrophenol	ND	4.9	1.9	ug/l		
100-02-7	4-Nitrophenol	ND	24	9.7	ug/l		
87-86-5	Pentachlorophenol	ND	24	9.7	ug/l		
108-95-2	Phenol	ND	4.9	1.9	ug/l		
95-95-4	2,4,5-Trichlorophenol	ND	4.9	2.4	ug/l		
88-06-2	2,4,6-Trichlorophenol	ND	4.9	1.9	ug/l		
83-32-9	Acenaphthene	ND	4.9	0.97	ug/l		
208-96-8	Acenaphthylene	ND	4.9	0.97	ug/l		
120-12-7	Anthracene	ND	4.9	0.97	ug/l		
56-55-3	Benzo(a)anthracene	ND	4.9	0.97	ug/l		
50-32-8	Benzo(a)pyrene	ND	4.9	0.97	ug/l		
205-99-2	Benzo(b)fluoranthene	ND	4.9	0.97	ug/l		
191-24-2	Benzo(g,h,i)perylene	ND	4.9	1.9	ug/l		
207-08-9	Benzo(k)fluoranthene	ND	4.9	0.97	ug/l		
101-55-3	4-Bromophenyl phenyl ether	ND	4.9	0.97	ug/l		
85-68-7	Butyl benzyl phthalate	ND	4.9	1.9	ug/l		
100-51-6	Benzyl Alcohol	ND	4.9	0.97	ug/l		
91-58-7	2-Chloronaphthalene	ND	4.9	0.97	ug/l		
106-47-8	4-Chloroaniline	ND	4.9	1.9	ug/l		
86-74-8	Carbazole	ND	4.9	0.97	ug/l		
218-01-9	Chrysene	ND	4.9	0.97	ug/l		
111-91-1	bis(2-Chloroethoxy)methane	ND	4.9	0.97	ug/l		
111-44-4	bis(2-Chloroethyl)ether	ND	4.9	1.9	ug/l		

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DC3007	Date Sampled:	09/18/03
Lab Sample ID:	F19588-1	Date Received:	09/19/03
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8270C SW846 3510C		
Project:	PBOW		

ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	Rev Qual
108-60-1	bis(2-Chloroisopropyl)ether	ND	4.9	0.97	ug/l		u
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.9	0.97	ug/l		
95-50-1	1,2-Dichlorobenzene	ND	4.9	0.97	ug/l		
541-73-1	1,3-Dichlorobenzene	ND	4.9	0.97	ug/l		
106-46-7	1,4-Dichlorobenzene	ND	4.9	0.97	ug/l		
121-14-2	2,4-Dinitrotoluene	ND	4.9	1.9	ug/l		
606-20-2	2,6-Dinitrotoluene	ND	4.9	1.9	ug/l		
91-94-1	3,3'-Dichlorobenzidine	ND	9.7	4.9	ug/l		
53-70-3	Dibenzo(a,h)anthracene	ND	4.9	1.9	ug/l		
132-64-9	Dibenzofuran	ND	4.9	0.97	ug/l		
84-74-2	Di-n-butyl phthalate	ND	4.9	1.9	ug/l		
117-84-0	Di-n-octyl phthalate	ND	4.9	2.4	ug/l		
84-66-2	Diethyl phthalate	ND	4.9	1.9	ug/l		
131-11-3	Dimethyl phthalate	ND	4.9	1.9	ug/l		
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.9	2.4	ug/l		
206-44-0	Fluoranthene	ND	4.9	0.97	ug/l		
86-73-7	Fluorene	ND	4.9	0.97	ug/l		
118-74-1	Hexachlorobenzene	ND	4.9	0.97	ug/l		
87-68-3	Hexachlorobutadiene	ND	4.9	1.9	ug/l		
77-47-4	Hexachlorocyclopentadiene	ND	4.9	1.9	ug/l		
67-72-1	Hexachloroethane	ND	4.9	1.9	ug/l		
193-39-5	Indeno(1,2,3-cd)pyrene	ND	4.9	1.9	ug/l		
78-59-1	Isophorone	ND	4.9	0.97	ug/l		
91-57-6	2-Methylnaphthalene	ND	4.9	0.97	ug/l		
88-74-4	2-Nitroaniline	ND	4.9	1.9	ug/l		
99-09-2	3-Nitroaniline	ND	4.9	1.9	ug/l		
100-01-6	4-Nitroaniline	ND	4.9	1.9	ug/l		
91-20-3	Naphthalene	ND	4.9	0.97	ug/l		
98-95-3	Nitrobenzene	ND	4.9	0.97	ug/l		
621-64-7	N-Nitroso-di-n-propylamine	ND	4.9	1.9	ug/l		
86-30-6	N-Nitrosodiphenylamine	ND	4.9	1.9	ug/l		
85-01-8	Phenanthrene	ND	4.9	0.97	ug/l		
129-00-0	Pyrene	ND	4.9	0.97	ug/l		
120-82-1	1,2,4-Trichlorobenzene	ND	4.9	0.97	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44% <sup>a</sup>		19-90%
4165-62-2	Phenol-d5	27% <sup>a</sup>		10-68%
118-79-6	2,4,6-Tribromophenol	84% <sup>a</sup>		36-137%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	DC3007	Date Sampled:	09/18/03
Lab Sample ID:	F19588-1	Date Received:	09/19/03
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8270C SW846 3510C		
Project:	PBOW		

## ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	81% <sup>a</sup>		49-119%
321-60-8	2-Fluorobiphenyl	76% <sup>a</sup>		45-118%
1718-51-0	Terphenyl-d14	82% <sup>a</sup>		46-135%

(a) Surrogate recoveries corrected for double spike.

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**DATA VALIDATION WORKSHEETS  
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date: 11/22

Project: Plum Brook SDG: PB044 / F19588 Matrix/No. Samples: W-3

<b>I. Technical Holding Times</b>			
<b>A. Sample Preservation, Handling and Transport</b>			
1. Have all samples been preserved correctly?	<input checked="" type="radio"/> Yes	No	N/A
2. Have sample temperatures been kept at 4° C (+ or - 2°)?	<input checked="" type="radio"/> Yes	No	N/A
3. Were all samples received in proper condition?	<input checked="" type="radio"/> Yes	No	N/A
4. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
Coolers @ 3.1°, 3.8°C.			
<b>B. Chain of Custody</b>			
1. Were all samples properly recorded on COCs?	<input checked="" type="radio"/> Yes	No	N/A
2. Were correct analyses performed on samples?	<input checked="" type="radio"/> Yes	No	N/A
<b>C. Holding Times</b>			
1. Were samples extracted and analyzed within acceptable holding times?	<input checked="" type="radio"/> Yes	No	N/A
2. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
<b>SAMPLED</b>	<b>PREPPED</b>	<b>ANALYZED</b>	
9/18	9/22	9/28	
	9/23	9/26	
<b>II. GC/MS Instrument Performance Check</b>			
1. Were instrument performance check samples run for each analysis period?	<input checked="" type="radio"/> Yes	No	N/A
2. Were ion abundance criteria met for DTFP analysis?	<input checked="" type="radio"/> Yes	No	N/A
3. Do laboratory forms match raw data?	Yes	No	<input checked="" type="radio"/> N/A
4. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b>			
ICAL CCL 148base criteria met.			

**DATA VALIDATION WORKSHEETS  
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date 11/22  
 Project: Plumbrook SDG: PB044 / F19588 Matrix/No. Samples: W-3

<b>III. Initial Calibration</b>			
1. Were correct concentrations of standards used for initial calibration? Were samples analyzed within 12 hours of associated instrument performance check?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Were initial calibration RRFs for all volatile target compounds and system monitoring compounds $\geq 0.05$ ? Do recalculations for RRFs agree with reported values?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
3. Were %RSDs $\leq 30\%$ for all volatile target compounds? Do recalculations for RSDs agree with reported values?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
4. Were any qualifications required based on this information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> <div style="text-align: center; margin-top: 10px;">           9/25 @ 10:40  </div>			
<b>IV. Continuing Calibration</b>			
1. Were continuing calibration samples run at the required frequency, and compared to the correct initial calibration?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Did calculations from raw data agree with laboratory reported values for RRF and %D?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
3. Were continuing calibration RRFs for volatile organic compounds and system monitoring compounds (surrogates) $\geq 0.05$ ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
4. Were %D between initial calibration RRF and the continuing calibration RRFs within $\pm 25\%$ ?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
5. Were any qualifications required based on this information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> <div style="text-align: center; margin-top: 10px;">           9/26 @ 9:13  </div>			

**DATA VALIDATION WORKSHEETS  
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date 11/22

Subject: Plumbrook SDG: P3044 / F19588 Matrix/No. Samples: W-3

<b>V. Blanks</b>			
1. Were any target or non-target compounds reported in laboratory prep or calibration blanks?	Yes	No	N/A
2. Were method blank analyses performed at required frequency, and for each GC/MS system used to analyze samples for each type of analysis (i.e., matrix)?	Yes	No	N/A
3. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b> 9/28 MB - u's. 9/26 MB - u's.			
<b>VI. System Monitoring Compounds (Surrogate Spikes)</b>			
1. Were laboratory surrogate recoveries calculated and reported correctly?	Yes	No	N/A
2. Were surrogate recoveries within acceptable limits?	Yes	No	N/A
3. Were any qualifications required based on surrogate spike QC information?	Yes	No	N/A
<b>Comments/Qualifications:</b> 3003 71-94 2 R's. 3006 63-94 2 R's. 3007 27-84 2 R's.			
<b>VII. Matrix Spikes/Matrix Spike Duplicates</b>			
1. Were MS/MSD samples analyzed at required frequency for each sample matrix?	Yes	No	N/A
2. Were MS/MSD results for recovery and RPD within advisory limits?	Yes	No	N/A
3. Were Samples used for MS/MSD field blanks?	Yes	No	N/A
4. Were laboratory reported results correctly calculated from raw data?	Yes	No	N/A
5. Were any qualifications required, based on results of MS/MSD samples in conjunction with other QC information?	Yes	No	N/A
<b>Comments/Qualifications:</b> 9/28 MS - 71-107 2 R's      9/26 41-84 MSD - 78-115 2 R's      47-86 RPD    3-9    RPD      0-19			

**DATA VALIDATION WORKSHEETS  
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date: 11/22

Project: Plumbrook SDG: PB044/F19588 Matrix/No. Samples: w-3

<b>VIII. Laboratory Control Sample (LCS)</b>			
1. Were LCS samples run at correct frequency for each matrix samples?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Were LCS calculations performed correctly, and did laboratory reported values match raw data? Were recoveries within laboratory QC limits?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
4. Were any qualifications required based on LCS data in conjunction with other QC information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> 9/28 85-111 2 R's. 9/20 35-44 2 R's			
<b>IX. Internal Standards</b>			
1. Were standard area counts within a factor of two (-50% to +100%) from associated calibration standard?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Were retention times of internal standard within + or - 30 seconds of retention time of associated calibration check?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
3. Were any qualifications required based on internal standard results?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> ↘			
<b>X. Target Compound Identification</b>			
1. Are relative retention times (RRTs) within + or - 0.06 RRT units of standard RRT?	Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
2. Do sample compound spectra meet specified criteria in relation to laboratory standard spectra?	Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
3. Were all compounds accounted for on chromatogram?	Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
<b>Comments/Qualifications:</b> No cpds listed.			

**DATA VALIDATION WORKSHEETS  
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date 11/22  
 Project: Plumbrook SDG: PR044 / F19588 Matrix/No. Samples: W-3

<b>XI. Compound Quantitation and Reported Contract Required Quantitation Limits (CRQLs)</b>			
1. Were sample results correctly calculated and reported by laboratory?	Yes	No	N/A
2. Were correct internal standard quantitation ion and RRF used to quantify all compounds for all samples?	Yes	No	N/A
3. Were CRQLs adjusted to reflect sample dilutions and dry weight factors not accounted for by the method?	Yes	No	N/A
4. Were any laboratory QA/QC sample results calculated from peaks derived using manual integration?	Yes	No	N/A
5. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b> No cpds detected,			
<b>XII. Field QC</b>			
1. Were any Field Duplicates associated with this SDG?	<input checked="" type="radio"/> Yes	No	N/A
a. If Yes, were RPDs acceptable (50% for water samples, 100% for soil samples)?	<input checked="" type="radio"/> Yes	No	N/A
2. Were any field blanks or equipment rinsates associated with this SDG?	Yes	<input checked="" type="radio"/> No	N/A
a. If yes, were any compounds reported in samples >IDL?	Yes	No	N/A
b. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> 3003 3006 L used			
<b>XIII. Overall Assessment of Data</b>			
1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b>			

Quarterly GW Mon - CQAR

SDG: PB044 / F19588 Project: Plumbrook

Method: Explosives - 8330 Matrix/No. of Samples: Water - 3

Validation Samples: DC3003 - STL  
DC3006 - STL  
DC3007 - Accutest

### Data Validation Report Summary

	Status Code	Comments
1. Sample Preservation, Handling, and Transport	<u>A</u>	<u></u>
2. Chain of Custody	<u>A</u>	<u></u>
3. Holding Times	<u>A</u>	<u></u>
4. GC/MS Tune/Inst Perf	<u>N/A</u>	<u></u>
5. Calibrations	<u>A</u>	<u></u>
6. Blanks	<u>A</u>	<u></u>
7. Blank Spike/LCS	<u>A</u>	<u></u>
8. Matrix Spike	<u>A</u>	<u></u>
9. Surrogates	<u>A</u>	<u></u>
10. Internal Standards	<u>N/A</u>	<u></u>
11. Compound Identification	<u>A</u>	<u></u>
12. System Performance	<u>A</u>	<u></u>
13. Field QC Samples	<u>A</u>	<u></u>
14. Overall Assessment	<u>A</u>	<u></u>

Status Codes:

A = Acceptable

R = Data Rejected

X = Data acceptable but qualified due to problems





## SHAW E &amp; I INC

Client Sample ID: DC3006

## HPLC

Lot-Sample #....: H3I190201-004    Work Order #....: F0PV71AM    Matrix.....: WATER  
 Date Sampled....: 09/18/03    Date Received...: 09/19/03  
 Prep Date.....: 09/23/03    Analysis Date...: 09/24/03  
 Prep Batch #....: 3266507  
 Dilution Factor: 1    Method.....: SW846 8330

PARAMETER	RESULT	REPORTING			MDL	Rev <i>Jul</i>
		LIMIT	UNITS			
HMX	ND	0.50	ug/L	0.10	u	
RDX	ND	0.50	ug/L	0.13		
1,3,5-Trinitrobenzene	ND	0.20	ug/L	0.11		
1,3-Dinitrobenzene	ND	0.20	ug/L	0.080		
Tetryl	ND	0.20	ug/L	0.17		
Nitrobenzene	ND	0.20	ug/L	0.070		
2,4,6-Trinitrotoluene	ND	0.20	ug/L	0.080		
4-Amino-2,6-dinitrotoluene	ND	0.20	ug/L	0.11		
2-Amino-4,6-dinitrotoluene	ND	0.20	ug/L	0.090		
2,6-Dinitrotoluene	ND	0.20	ug/L	0.11		
2,4-Dinitrotoluene	ND	0.20	ug/L	0.070		
2-Nitrotoluene	ND	0.20	ug/L	0.14		
4-Nitrotoluene	ND	0.20	ug/L	0.17		
3-Nitrotoluene	ND	0.20	ug/L	0.13		

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
1-Chloro-3-nitrobenzene	93	(52 - 139)

Report of Analysis

Client Sample ID: DC3007	Date Sampled: 09/18/03
Lab Sample ID: F19588-1	Date Received: 09/19/03
Matrix: AQ - Water	Percent Solids: n/a
Method: SW846 8330A SW846 3535A	
Project: PBOW	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GG007490.D	1	10/02/03	SM	09/25/03	OP8624	GGG368
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1000 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q	Rev	Qual
2691-41-0	HMX	ND	0.20	0.075	ug/l			u
121-82-4	RDX	ND	0.20	0.075	ug/l			
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.050	ug/l			
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.050	ug/l			
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.050	ug/l			
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.050	ug/l			
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.050	ug/l			
98-95-3	Nitrobenzene	ND	0.20	0.050	ug/l			
88-72-2	o-Nitrotoluene	ND	0.20	0.050	ug/l			
99-08-1	m-Nitrotoluene	ND	0.20	0.050	ug/l			
99-99-0	p-Nitrotoluene	ND	0.20	0.075	ug/l			
479-45-8	Tetryl	ND	0.20	0.075	ug/l			
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.050	ug/l			
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.050	ug/l			

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	117%		51-137%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**DATA VALIDATION WORKSHEET  
EXPLOSIVES AND DEGRADATION PRODUCTS BY HPLC**

Reviewer: Kitchings

Date: 11/22

Project: Plumbrook

SDG: PR044 / F-19588

Matrix/No. Samples: W-3

<b>I. Technical Holding Times</b>															
<b>A. Sample Preservation, Handling and Transport</b>															
1. Have all samples been preserved correctly?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
2. Have sample temperatures been kept at 4° C (+or- 2° C)	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
3. Were all samples received in proper condition?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
4. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A												
Cooler @ 3.1° , 3.8° C.															
<b>B. Chain of Custody</b>															
1. Were all samples properly recorded on COCs?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
2. Were correct analyses performed on samples?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
<b>C. Holding Times</b>															
1. Were samples extracted and analyzed within acceptable holding times?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
2. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A												
<table style="width:100%; border:none;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:30%; text-align:center;">Sampled</th> <th style="width:30%; text-align:center;">Prepped</th> <th style="width:30%; text-align:center;">Analyzed</th> </tr> </thead> <tbody> <tr> <td>3003 3006</td> <td style="text-align:center;">— 9/18</td> <td style="text-align:center;">9/23</td> <td style="text-align:center;">9/24</td> </tr> <tr> <td>3007</td> <td style="text-align:center;">— 9/18</td> <td style="text-align:center;">9/25</td> <td style="text-align:center;">10/2</td> </tr> </tbody> </table>					Sampled	Prepped	Analyzed	3003 3006	— 9/18	9/23	9/24	3007	— 9/18	9/25	10/2
	Sampled	Prepped	Analyzed												
3003 3006	— 9/18	9/23	9/24												
3007	— 9/18	9/25	10/2												
<b>II. Initial Calibration</b>															
1. Were correct numbers and concentrations of standards used for initial calibration standards to establish calibration curve (i.e., water: 9 standards; soil: 7 standards)?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
2. For sample results calculated using initial calibration, was correct standard used for calculating sample result?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
3. Was calibration range within 25% of method range?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A												
4. Were retention Times ( RTs) within acceptable RT windows?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A												
<b>Comments/Qualifications:</b> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <math>\frac{1}{&lt;82}</math> </div> <div style="text-align: center;"> <math>\frac{2}{&lt;126}</math> </div> </div>															

**DATA VALIDATION WORKSHEET  
EXPLOSIVES AND DEGRADATION PRODUCTS BY HPLC**

Reviewer: Kitchings Date: 11/22

Project: Plumbrook SDG: PB044 / F19588 Matrix/No. Samples: w-3

<b>III. Continuing Calibration</b>			
1. Were continuing calibration samples run at the required frequency, and compared to the correct initial calibration?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
2. Were RTs for all standard compounds in continuing calibration samples within acceptable RT window?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
3. Were continuing calibration recoveries within control limit of 75-125%?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
4. Did laboratory reported calculations and data match raw data?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
5. Were any qualifications required based on this information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> N/A
<b>Comments/Qualifications:</b>  ✓			

<b>IV. Blanks</b>			
1. Does data package include summary of method blank results?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
2. Were any compounds reported in laboratory method blanks?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> N/A
3. Were method blank analyses performed at required frequency?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
4. Were any qualifications required based on this information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> N/A
<b>Comments/Qualifications:</b> 9/24 - u's. 10/2 - u's.			

<b>V. System Monitoring Compounds (Surrogate Spikes)</b>			
1. Were all samples spiked with correct surrogate compounds?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
2. Were laboratory surrogate recoveries calculated and reported correctly on data forms?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
3. Were surrogate recoveries within laboratory established limits?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
4. Were any qualifications required based on surrogate spike QC information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> N/A
<b>Comments/Qualifications:</b>			

**DATA VALIDATION WORKSHEET  
EXPLOSIVES AND DEGRADATION PRODUCTS BY HPLC**

Reviewer: Kitchings Date: 11/22

Project: Plumbrook SDG: PB044 / F19588 Matrix/No. Samples: W-3

VI. Matrix Spikes/ Matrix Spike Duplicates			
1. Were MS/MSD samples analyzed at required frequency for each ample matrix (at least 5%)?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Were MS/MSD results for recovery (+or- 40%) RPD (<30) within laboratory QC limits?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
3. Were Samples used for MS/MSD field blanks?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
4. Were matrix spike recoveries and RPDs calculated and reported correctly?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
5. Were any qualifications required, based on results of MS/MSD samples in conjunction with other QC information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>MS 75-111</p> <p>MSD 71-111</p> <p>RPD 0.11-5.9</p> </div> <div style="width: 45%;"> <p>RDX <math>\dot{\bar{c}}</math> m-nt-high - 81-112</p> <p>RDX high " - bk 81-106</p> <p>RDX high (0-12)</p> </div> <div style="width: 10%; font-size: 2em;">}</div> <div style="width: 35%;"> <p>LCS of no finds.</p> </div> </div>			

VII. Laboratory Control Sample (LCS)			
1. Were LCS samples run?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. If performed, were LCS recoveries within the QC limits?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
3. If performed, were LCS calculations performed correctly, and did laboratory reported values match raw data?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
4. Were any qualifications required based on LCS data in conjunction with other QC information?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>LCS 81-107 90% R.S.</p> </div> <div style="width: 45%;"> <p>m-nitrotoluene - high - sup @ nondetect - no finds</p> </div> </div>			

**DATA VALIDATION WORKSHEET  
EXPLOSIVES AND DEGRADATION PRODUCTS BY HPLC**

Reviewer: Kitchings Date: 11/22

Project: Plumbrook SDG: PB044 / F19588 Matrix/No. Samples: 61-3

VIII. Field QC Samples			
1. Were field blank or equipment rinsate samples associated with this SDG?	Yes	<u>No</u>	N/A
2. Were any compounds present in any associated field blank samples?	Yes	No	N/A
3. Were any field duplicate pairs analyzed in this SDG?	<u>Yes</u>	No	N/A
4. Were RPDs field duplicate pairs within acceptable limits (+ or -20%)	<u>Yes</u>	No	N/A
5. Were any qualifications required based on field QC information?	Yes	<u>No</u>	N/A
<b>Comments/Qualifications:</b> 3003 3006 ↳ u'se			
IX. Compound Identification			
1. Are relative retention times (RRTs) within acceptable RRT windows?	Yes	No	<u>N/A</u>
2. Were identified compounds confirmed on second column?	Yes	No	N/A
3. Were any qualification required based on this information?	Yes	No	<u>N/A</u>
<b>Comments/Qualifications:</b> No cps detected			
X. Overall Assessment of Data			
1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	<u>No</u>	N/A
<b>Comments/Qualifications:</b>			

Quarterly GW Mon - CQAR

SDG: PB044 (E-19588) Project: PLUMBROOK

Method: METALS <sup>6010 B</sup> 7470 A Matrix/No. of Samples: W-3

Validation Samples: DC 3003 - STL  
DC 3006 - STL  
DC 3007 - Accutest

### Data Validation Report Summary

	Status Code	Comments
1. Sample Preservation, Handling, and Transport	<u>A</u>	<u></u>
2. Chain of Custody	<u>A</u>	<u></u>
3. Holding Times	<u>A</u>	<u></u>
4. Calibrations	<u>A</u>	<u></u>
5. Blanks	<u>X</u>	<u></u>
6. ICP/ICS	<u>A</u>	<u></u>
7. Blank Spike/LCS	<u>A</u>	<u></u>
8. Duplicates	<u>A</u>	<u></u>
9. Matrix Spike	<u>A</u>	<u></u>
10. Furnace Atomic Absorption QC	<u>N/A</u>	<u></u>
11. ICP Serial Dilution	<u>X</u>	<u></u>
12. Sample Result Verification	<u>A</u>	<u></u>
13. Field QC Samples	<u>A</u>	<u></u>
14. Overall Assessment	<u>X</u>	<u></u>

Status Codes:

A = Acceptable

R = Data Rejected

X = Data acceptable but qualified due to problems

Qualifications:

- 6a • Thallium was present in the method blanks associated w/ 3003 & 3006 and was qualified as "B" in samples 3003T & 3006T.
- 13 • A high %D in the serial dilution for 3007 T/D resulted in "J" qualifiers for Ba, Ca & Mn in this sample.

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable or qualified

Date: 11/22/2003

Validator's Signature: J. Thomas Kitchin's

Peer Reviewer:

SHAW E & I INC

Client Sample ID: DC3003

TOTAL Metals

Lot-Sample #...: H3I190201-002

Matrix.....: WATER

Date Sampled...: 09/18/03

Date Received...: 09/19/03

PARAMETER	RESULT	REPORTING LIMIT	UNITS <sup>Rev</sup> <sub>Qu</sub>	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 3266166						
Mercury	ND	0.20	ug/L <sup>u</sup>	SW846 7470A	09/23-09/24/03	F0PVK1AG
		Dilution Factor: 1		Analysis Time...: 12:51	MDL.....: 0.030	
Prep Batch #...: 3266181						
Aluminum	86.5 B	200	ug/L <sup>J</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AQ
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 41.3	
Antimony	ND	60.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AR
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AT
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 2.6	
Barium	177 B	200	ug/L <sup>J</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AU
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AV
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AW
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 0.84	
Calcium	159000	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1AX
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 58.2	
Chromium	ND	10.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1A0
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1A1
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 2.0	
Copper	ND	25.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1A2
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 3.0	
Iron	156	100	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1A3
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 45.8	
Lead	ND G	12.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1A4
		Dilution Factor: 1		Analysis Time...: 14:51	MDL.....: 1.6	

(Continued on next page)

SHAW E & I INC

Client Sample ID: DC3003

TOTAL Metals

Lot-Sample #...: H3I190201-002

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS <sup>Rev</sup> <sub>Qud</sub>	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Magnesium	62000	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1A5
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 37.0	
Manganese	72.9	15.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1A6
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 1.6	
Nickel	ND	40.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1A7
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 2.8	
Potassium	12100	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1A8
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 66.8	
Selenium	ND	5.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1A9
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 1.5	
Silver	ND	10.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AA
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 1.9	
Sodium	120000	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1AC
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 464	
Thallium	3.1 B,J	10.0	ug/L <sup>B Ga</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AD
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L <sup>u</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AE
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 3.6	
Zinc	4.8 B	20.0	ug/L <sup>J</sup>	SW846 6010B	09/23-09/29/03	F0PVK1AF
			Dilution Factor: 1	Analysis Time...: 14:51	MDL.....: 2.4	

NOTE (S) :

- B Estimated result. Result is less than RL.
- G Elevated reporting limit. The reporting limit is elevated due to matrix interference.
- J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

SHAW E & I INC

Client Sample ID: DC3003

DISSOLVED Metals

Lot-Sample #...: H3I190201-002

Matrix.....: WATER

Date Sampled...: 09/18/03

Date Received...: 09/19/03

PARAMETER	RESULT	REPORTING LIMIT	UNITS <sup>Revised</sup> <sub>Quel</sub>	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 3266166						
Mercury	ND	0.20	ug/L $\mu$	SW846 7470A	09/23-09/24/03	F0PVK1CK
		Dilution Factor: 1		Analysis Time...: 12:45	MDL.....: 0.030	
Prep Batch #...: 3266175						
Aluminum	61.8 B	200	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1CT
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 41.3	
Antimony	ND	60.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1CU
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1CV
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 2.6	
Barium	177 B	200	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1CW
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1CX
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1C0
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 0.84	
Calcium	158000	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1C1
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 58.2	
Chromium	ND	10.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1C2
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1C3
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 2.0	
Copper	ND	25.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1C4
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 3.0	
Iron	92.7 B	100	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1C5
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 45.8	
Lead	ND G	13.0	ug/L $\mu$	SW846 6010B	09/23-09/29/03	F0PVK1C6
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 1.6	

(Continued on next page)

## SHAW E &amp; I INC

Client Sample ID: DC3003

## DISSOLVED Metals

Lot-Sample #...: H3I190201-002

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Magnesium	61400	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1C7
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 37.0	
Manganese	71.5	15.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1C8
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 1.6	
Nickel	ND	40.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CA
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 2.8	
Potassium	11900	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CC
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 66.8	
Selenium	ND	5.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CD
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 1.5	
Silver	ND	10.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CE
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 1.9	
Sodium	118000	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CF
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 464	
Thallium	ND	10.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CG
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CH
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 3.6	
Zinc	2.6 B	20.0	ug/L	SW846 6010B	09/23-09/29/03	F0PVK1CJ
		Dilution Factor: 1		Analysis Time...: 13:16	MDL.....: 2.4	

**NOTE(S) :**

B Estimated result. Result is less than RL.

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.

SHAW E & I INC

Client Sample ID: DC3006

TOTAL Metals

Lot-Sample #...: H3I190201-004  
Date Sampled...: 09/18/03

Date Received...: 09/19/03

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS <sup>Rev</sup> <sub>Quel</sub>	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 3266166						
Mercury	ND	0.20	ug/L U	SW846 7470A	09/23-09/24/03	F0PV71AG
		Dilution Factor: 1		Analysis Time...: 13:00	MDL.....: 0.030	
Prep Batch #...: 3266181						
Aluminum	88.6 B	200	ug/L J	SW846 6010B	09/23-09/29/03	F0PV71AQ
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 41.3	
Antimony	ND	60.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71AR
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71AT
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 2.6	
Barium	172 B	200	ug/L J	SW846 6010B	09/23-09/29/03	F0PV71AU
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71AV
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71AW
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 0.84	
Calcium	156000	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PV71AX
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 58.2	
Chromium	ND	10.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71AO
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71A1
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 2.0	
Copper	ND	25.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71A2
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 3.0	
Iron	142	100	ug/L	SW846 6010B	09/23-09/29/03	F0PV71A3
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 45.8	
Lead	ND G	13.0	ug/L U	SW846 6010B	09/23-09/29/03	F0PV71A4
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 1.6	

(Continued on next page)

SHAW E & I INC

Client Sample ID: DC3006

TOTAL Metals

Lot-Sample #...: H3I190201-004

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Magnesium	60600	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PV71A5
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 37.0	
Manganese	70.9	15.0	ug/L	SW846 6010B	09/23-09/29/03	F0PV71A6
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 1.6	
Nickel	ND	40.0	ug/L	SW846 6010B	09/23-09/29/03	F0PV71A7
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 2.8	
Potassium	11800	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PV71A8
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 66.8	
Selenium	ND	5.0	ug/L	SW846 6010B	09/23-09/29/03	F0PV71A9
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 1.5	
Silver	ND	10.0	ug/L	SW846 6010B	09/23-09/29/03	F0PV71AA
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 1.9	
Sodium	116000	5000	ug/L	SW846 6010B	09/23-09/29/03	F0PV71AC
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 464	
Thallium	8.3 B,J	10.0	ug/L	SW846 6010B	09/23-09/29/03	F0PV71AD
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L	SW846 6010B	09/23-09/29/03	F0PV71AE
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 3.6	
Zinc	ND	20.0	ug/L	SW846 6010B	09/23-09/29/03	F0PV71AF
		Dilution Factor: 1		Analysis Time...: 15:05	MDL.....: 2.4	

NOTE (S) :

- B Estimated result. Result is less than RL.
- G Elevated reporting limit. The reporting limit is elevated due to matrix interference.
- J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

## SHAW E &amp; I INC

Client Sample ID: DC3006

## DISSOLVED Metals

Lot-Sample #...: H3I190201-004

Matrix.....: WATER

Date Sampled...: 09/18/03

Date Received...: 09/19/03

PARAMETER	RESULT	REPORTING LIMIT	UNITS	RE <sup>d</sup> METH	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 3266166							
Mercury	ND	0.20	ug/L	u	SW846 7470A	09/23-09/24/03	F0PV71CK
		Dilution Factor: 1			Analysis Time...: 12:58	MDL.....: 0.030	
Prep Batch #...: 3266175							
Aluminum	72.8 B	200	ug/L	J	SW846 6010B	09/23-09/29/03	F0PV71CT
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 41.3	
Antimony	ND	60.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71CU
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71CV
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 2.6	
Barium	174 B	200	ug/L	J	SW846 6010B	09/23-09/29/03	F0PV71CW
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71CX
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71C0
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 0.84	
Calcium	157000	5000	ug/L		SW846 6010B	09/23-09/29/03	F0PV71C1
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 58.2	
Chromium	ND	10.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71C2
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71C3
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 2.0	
Copper	ND	25.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71C4
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 3.0	
Iron	99.1 B	100	ug/L	J	SW846 6010B	09/23-09/29/03	F0PV71C5
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 45.8	
Lead	ND G	13.0	ug/L	u	SW846 6010B	09/23-09/29/03	F0PV71C6
		Dilution Factor: 1			Analysis Time...: 13:39	MDL.....: 1.6	

(Continued on next page)

## SHAW E &amp; I INC

Client Sample ID: DC3006

## DISSOLVED Metals

Lot-Sample #...: H3I190201-004

Matrix.....: WATER

PARAMETER	RESULT	REPORTING			METHOD	PREPARATION- WORK	
		LIMIT	UNITS <sup>Rev</sup> <i>Qual</i>			ANALYSIS DATE	ORDER #
Magnesium	60500	5000	ug/L		SW846 6010B	09/23-09/29/03	F0PV71C7
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 37.0	
Manganese	71.2	15.0	ug/L		SW846 6010B	09/23-09/29/03	F0PV71C8
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 1.6	
Nickel	ND	40.0	ug/L <i>u</i>		SW846 6010B	09/23-09/29/03	F0PV71CA
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 2.8	
Potassium	11500	5000	ug/L		SW846 6010B	09/23-09/29/03	F0PV71CC
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 66.8	
Selenium	ND	5.0	ug/L <i>u</i>		SW846 6010B	09/23-09/29/03	F0PV71CD
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 1.5	
Silver	ND	10.0	ug/L <i>u</i>		SW846 6010B	09/23-09/29/03	F0PV71CE
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 1.9	
Sodium	115000	5000	ug/L		SW846 6010B	09/23-09/29/03	F0PV71CF
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 464	
Thallium	6.9 B,J	10.0	ug/L <i>B Ga</i>		SW846 6010B	09/23-09/29/03	F0PV71CG
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L <i>u</i>		SW846 6010B	09/23-09/29/03	F0PV71CH
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 3.6	
Zinc	ND	20.0	ug/L <i>u</i>		SW846 6010B	09/23-09/29/03	F0PV71CJ
			Dilution Factor: 1		Analysis Time...: 13:39	MDL.....: 2.4	

**NOTE(S) :**

B Estimated result. Result is less than RL.

G Elevated reporting limit. The reporting limit is elevated due to matrix interference.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Report of Analysis

Client Sample ID: DC3007	Date Sampled: 09/18/03
Lab Sample ID: F19588-1	Date Received: 09/19/03
Matrix: AQ - Water	Percent Solids: n/a
Project: PBOW	

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method		
Aluminum	69 U	200	69	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Antimony	2.1 U	5.0	2.1	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Arsenic	3.1 U	10	3.1	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Barium	162 B	200	1.8	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Beryllium	0.50 U	5.0	0.50	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Cadmium	0.40 U	5.0	0.40	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Calcium	151000	1000	66	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Chromium	1.7 U	10	1.7	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Cobalt	0.60 U	50	0.60	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Copper	1.0 U	25	1.0	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Iron	367	300	20	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Lead	1.4 U	5.0	1.4	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Magnesium	57500	5000	45	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Manganese	65.1	15	0.40	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Mercury	0.052 U	1.0	0.052	ug/l	1	u	09/22/03	09/24/03	SL	SW846 7470A	SW846 7470A
Nickel	1.1 U	40	1.1	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Potassium	12800	5000	120	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Selenium <sup>a</sup>	15 U	10	15	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Silver	1.8 U	10	1.8	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Sodium	115000	5000	170	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Thallium	3.3 U	10	3.3	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Vanadium	0.90 U	50	0.90	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A
Zinc	8.0 U	20	8.0	ug/l	1	u	09/27/03	09/29/03	DM	SW846 6010B	SW846 3010A

*Rw*  
*Qual*  
DF

(a) Elevated reporting limits due to matrix interference.

RL = Reporting Limit  
MDL = Method Detection Limit

U = Indicates a result < MDL  
B = Indicates a result >= MDL but < RL

Report of Analysis

Client Sample ID:	DC3007	Date Sampled:	09/18/03
Lab Sample ID:	F19588-1A	Date Received:	09/19/03
Matrix:	AQ - Water Filtered	Percent Solids:	n/a
Project:	PBOW		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	69 U	200	69	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Antimony	2.1 U	5.0	2.1	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Arsenic	3.1 U	10	3.1	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Barium	167 B	200	1.8	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Beryllium	0.50 U	5.0	0.50	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Cadmium	0.40 U	5.0	0.40	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Calcium	152000	1000	66	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Chromium	1.7 U	10	1.7	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Cobalt	0.60 U	50	0.60	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Copper	1.0 U	25	1.0	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Iron	320	300	20	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Lead	1.4 U	5.0	1.4	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Magnesium	57800	5000	45	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Manganese	64.7	15	0.40	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Mercury	0.052 U	1.0	0.052	ug/l	1	09/22/03	09/24/03	SL	SW846 7470A
Nickel	1.1 U	40	1.1	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Potassium	12800	5000	120	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Selenium <sup>a</sup>	31 U	10	31	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Silver	1.8 U	10	1.8	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Sodium	115000	5000	170	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Thallium	3.3 U	10	3.3	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Vanadium	0.90 U	50	0.90	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A
Zinc	8.0 U	20	8.0	ug/l	1	09/27/03	09/29/03	DM	SW846 3010A

(a) Elevated reporting limits due to matrix interference.

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 B = Indicates a result > = MDL but < RL

**DATA VALIDATION WORKSHEET  
METALS**

Reviewer: Kitchings Date: 11/22

Project: Plumbrook SDG: PB #4 / F19588 Matrix/No. Samples W-3

<b>I. Sample Management</b>			
<b>A. Sample Preservation, Handling and Transport</b>			
1. Have all samples been preserved with HNO <sub>3</sub> to pH <2?	<input checked="" type="radio"/> Yes	No	N/A
2. Have sample temperatures been kept at 4° C (+ or - 2° C)?	<input checked="" type="radio"/> Yes	No	N/A
3. Were all samples received in proper condition?	<input checked="" type="radio"/> Yes	No	N/A
4. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
Cooler @ <u>3.1, 3.8° C.</u>			
<b>B. Chain of Custody</b>			
1. Were all samples properly recorded on COCs?	<input checked="" type="radio"/> Yes	No	N/A
2. Were correct analyses performed on samples?	<input checked="" type="radio"/> Yes	No	N/A
<b>C. Holding Times</b>			
1. Were samples analyzed within acceptable holding times?	<input checked="" type="radio"/> Yes	No	N/A
2. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
SAMPLED		PREPPED/ANALYZED	
9/18	ICP 9/23	9/29	
	Hg 9/23	9/24	
9/18	ICP 9/27	9/29	
	Hg 9/22	9/24	
<b>II. Calibrations</b>			
1. Were proper number of calibration standards used for each analytical instrument used?	<input checked="" type="radio"/> Yes	No	N/A
2. Is the calibration correlation coefficient >or = 0.995 for each analytical instrument used?	Yes	No	<input checked="" type="radio"/> N/A
3. Are initial and continuing calibration verification %R within 10% (+ or - 1%) acceptance window?	<input checked="" type="radio"/> Yes	No	N/A
4. Are CRDL Standard %R within 10% (+ or - 1%) acceptance window?	Yes	No	<input checked="" type="radio"/> N/A
5. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b>			
ICV'S CCV'S I ✓			

**DATA VALIDATION WORKSHEET  
METALS**

Reviewer: Kitchings

Date: 11/22

Project: Plumbrook

SDG: PB044/F19588

Matrix/No. Samples W-3

<b>III. Blanks</b>			
1. Are any analytes reported in laboratory prep or calibration blanks above the IDL?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Are any analytes reported as negative values in laboratory prep or calibration blanks?	Yes	<input checked="" type="radio"/> No	N/A
3. Were any qualifications required based on this information?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
<b>Comments/Qualifications:</b>  <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>MB T - TL@7.1 D - TR@4.3</p> <p>303T } "B" ← 3006T }</p> </div> <div style="width: 45%;"> <p>All MB ICB CCBs US.</p> </div> </div>			
<b>IV. ICP Interference Check Sample (ICS)</b>			
1. Were ICS samples run at the beginning and end of each sample analysis run?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Are ICS %R within 80-120% acceptable control limits?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
3. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> <p style="text-align: center;">↘ 81.7 - 12.3</p>			
<b>V. Blank Spike/Laboratory Control Sample (LCS)</b>			
1. Are all aqueous LCS %R within 80-120% control limits?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Are all solid LCS %R within control limits established by EPA?	Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
3. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b>  <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Tst Hg<sup>+</sup> - 95 ICP <del>F</del> - 100-109 Diss Hg<sup>+</sup> 95 ICP 101-110 ~</p> </div> <div style="width: 45%;"> <p>LCS Hg 100 ~ ICP 96.0 - 11.9 ~</p> </div> </div>			

**DATA VALIDATION WORKSHEET  
METALS**

Reviewer: Kitchings

Date: 11/22

Project: Plumbrook

SDG: PB044 / F19588

Matrix/No. Samples W-3

<b>VI. Duplicates</b>			
1. Were samples used for duplicate sample analysis identified as field blanks?	Yes	No	N/A
2. For duplicate samples >5x CRDL, were RPDs within control limits of + or - 20% for water, or + or - 35% for soil?	Yes	No	N/A
3. For duplicate samples <5x CRDL, were duplicate samples within control limit of + or - CRDL for water, or + or - 2xCRDL for soil?	Yes	No	N/A
4. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b>			
<b>VII. Matrix Spike</b>			
1. Were samples used for matrix spike sample analysis identified as field blanks?	Yes	No	N/A
2. Were spike recoveries within 75-125% limits (limits do not apply when original sample concentration exceeds spike concentration by a factor of 4)?	Yes	No	N/A
3. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b>			
<p>3003 3006</p> <p>Total Hg 96/101 ICP 84-111/91-114</p> <p>DISS2. Hg 99/94 ICP 102-113/101-117</p> <p>96.7 Hg 100 101-115.1</p>			
<b>VIII. ICP Serial Dilution</b>			
1. Were %Ds for ICP serial dilution samples within 10% for analytes with concentrations greater than 50x IDL?	Yes	No	N/A
2. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b>			
<p>3007</p> <p>SD - high for Bi, Ca, Mn (J)</p>			

**DATA VALIDATION WORKSHEET  
METALS**

Reviewer: Kitchings

Date: 11/22

Project: Plumbrook SDG: PB044 / F19588

Matrix/No. Samples W-3

<b>IX. Sample Result Qualification</b> Not Required For Level III Data Validation			
1. Were sample results reported by laboratory supported by raw data?	Yes	No	N/A
2. Were correct calculations used to determine sample results?	Yes	No	N/A
3. Were any qualifications required based on this information?	Yes	No	N/A
<b>Comments/Qualifications:</b> <p align="center"><i>No raw data</i></p>			
<b>X. Field QC</b>			
1. Were any Field Duplicates associated with this SDG?	<input checked="" type="radio"/> Yes	No	N/A
a. If Yes, were RPDs acceptable (50% for water samples, 100% for soil samples)?	<input checked="" type="radio"/> Yes	No	N/A
2. Were any field blanks or equipment rinsates associated with this SDG?	Yes	<input checked="" type="radio"/> No	N/A
a. If yes, were any analytes reported in samples >IDL?	Yes	No	N/A
b. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b> <p style="margin-left: 40px;">             3003                      3006              8.3      TR              3.1              5.2 / 5.7 } 30% <input checked="" type="radio"/> J              — qual. as "B" due to blank.      } no other qual           </p>			
<b>XI. Overall Assessment of Data</b>			
1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	<input checked="" type="radio"/> No	N/A
<b>Comments/Qualifications:</b>			

**Attachment 2**

**Chain of Custody Forms**



STL Cooler Receipt Form/Narrative North Canton Facility		Lot Number: <u>H37190201</u>
Client: <u>SHOWETI</u> Project: <u>P Bow</u>		Quote#: _____
Cooler Received on: <u>9-19-03</u> Opened on: <u>9-19-03</u>		by: <u>[Signature]</u> (Signature)
Fedx <input checked="" type="checkbox"/> Client Drop Off <input type="checkbox"/> UPS <input type="checkbox"/> Airborne <input type="checkbox"/> Other: _____		
Cooler <input checked="" type="checkbox"/> Safe <input type="checkbox"/> Foam Box <input type="checkbox"/> Client Cooler <input type="checkbox"/> Other: _____		
STL Shipper No#: <u>KNOY</u>		
1. Were custody seals on the outside of the cooler? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Intact? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>
If YES, Quantity <u>2</u> Location <u>over lid</u>		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Were the custody seals signed and dated?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. Shipper's packing slip attached to this form?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
3. Were custody papers included inside the cooler and relinquished?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
4. Did you sign the custody papers in the appropriate place?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
5. Packing material used:		
Peanuts <input type="checkbox"/> Bubble Wrap <input checked="" type="checkbox"/> Vermiculite <input type="checkbox"/> Foam <input type="checkbox"/> None <input type="checkbox"/> Other: _____		
6. Cooler temperature upon receipt <u>3.1</u> °C (see back of form for multiple coolers/temp)		
METHOD: Temp Vial <input type="checkbox"/> Coolant & Sample <input type="checkbox"/> Against Bottles <input type="checkbox"/> IR <input checked="" type="checkbox"/> ICE/H <sub>2</sub> O Slurry <input type="checkbox"/>		
COOLANT: Wet Ice <input checked="" type="checkbox"/> Blue Ice <input type="checkbox"/> Dry Ice <input type="checkbox"/> Water <input type="checkbox"/> None <input type="checkbox"/>		
7. Did all bottles arrive in good condition (Unbroken)?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
8. Did all bottle labels and tags agree with the custody papers?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
9. Were samples at the correct pH? (record on back)		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
10. Were correct bottles used for the tests indicated?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
11. Were air bubbles >6 mm in any VOA vials?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>
12. Was a sufficient amount of sample sent in each bottle?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Contacted PM _____ Date: _____ by: _____ via Voice Mail <input type="checkbox"/> Verbal <input type="checkbox"/> Other <input type="checkbox"/>		
Concerning:		
<input checked="" type="checkbox"/> MACRO <input type="checkbox"/> MACRO		
<b>1. CHAIN OF CUSTODY</b>		
SR1A	The chain of custody and sample bottles did not agree. The following discrepancies occurred	
	_____	
	_____	
	_____	
<b>2. SAMPLE CONDITION</b>		
SR2A	Sample(s) _____ were received or requested after the recommended holding time had expired.	
SR2B	Sample(s) _____ were received with insufficient volume.	
SR2C	Sample(s) _____ were received in a broken container.	
<b>3. SAMPLE PRESERVATION</b>		
SR3A	Sample(s) _____ were further preserved in sample receiving to meet recommended pH level(s). <i>Nitric Acid Lot # 061603-HNO<sub>3</sub>; Sulfuric Acid Lot # 112801-H<sub>2</sub>SO<sub>4</sub>; Sodium Hydroxide Lot # 011102-NaOH; Hydrochloric Acid Lot # 100902-HCl; Sodium Hydroxide and Zinc Acetate Lot # 112801-CH<sub>3</sub>COO<sub>2</sub>ZN/NaOH</i>	
SR3B	Sample(s) _____ were received with bubble > 6 mm in diameter (cc: PM)	
<b>4. Other (see below or back)</b>		

H3I190201

REFERENCE COC NO.: PR09 18 03STL-K  
 PAGE 02 OF 2

ANALYSIS REQUEST AND CHAIN-OF-CUSTODY RECORD



Project Name/No: PR09  
 Sample Team Member: David Kessler  
 Profit Center: Knoxville  
 Project Manager: Steve Downey  
 Project No.: 843656  
 Required Report Date: 21 DAYS

Sample Shipment Date: 9/18/03  
 Laboratory Destination: STL-Knoxville  
 Laboratory Contact: Jamie McKinney  
 Project Contact/Phone: Maureen McMyler/865-690-3211  
 Carrier Waybill No.: 83702140191

Bill To: Accounting  
 Shaw E & I  
 312 Directors Drive  
 Knoxville, TN 37923  
 Report To: Maureen McMyler  
 Shaw E & I  
 312 Directors Drive  
 Knoxville, TN 37923

Sample Number	Sample Type/Description	Date/Time Collected	Container Type	Sample Volume	Pre-servative	Requested Testing Program	Condition on Receipt	Disposal Record
DC3003 MSD	WATER	9/18/03 1220	1 - Amber 1 - HDPE 1 - HDPE 2 - Amber	1 L 250 mL 250 mL 1 L	Cool HNO3 HNO3 Cool	Explosives by 8830 Total TAL Metals by 6010B/7470A Dissolved TAL Metals by 6010B/7470A TCL SVOCs by 8270C		
DC3006	WATER	9/18/03 1220	1 - Amber 1 - Poly 1 - Poly 2 - Amber 3 - Glass 1 - Poly 1 - Amber	1 L 250 mL 250 mL 1 L 40 mL 1 L 40 mL	Cool HNO3 HNO3 Cool HCL NaOH HCL HNO3	TCL SVOCs by 8270C TCL VOCs by 8260B Cyanide by 9010/9012 TCV VOCs by 8260B Explosives Total TAL Metals Dissolved TAL Metals TCL SVOCs TCL VOCs Cyanide		
DC3000	WATER	9/18/03 1550	1 - Poly 1 - Poly 2 - Amber 3 - Glass 1 - Poly	1 L 250 mL 250 mL 1 L 40 mL 1 L	Cool HNO3 HNO3 Cool HCL NaOH Cool	Explosives Total TAL Metals Dissolved TAL Metals TCL SVOCs TCL VOCs Cyanide		

Special Instructions:

Possible Hazard Identification:

Non-haz:  Flammable: \_\_\_\_\_ Poison B: \_\_\_\_\_ Unknown: \_\_\_\_\_  
 Turnaround Time: \_\_\_\_\_ Level of QC Required: \_\_\_\_\_

Sample Disposal: \_\_\_\_\_ Disposal by Lab:  Archive: \_\_\_\_\_  
 Return to Client: \_\_\_\_\_

Normal:  Rush: \_\_\_\_\_  
 1. Relinquished by: David Kessler Date: 9/18/03  
 Time: 1800  
 2. Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 3. Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

Project Specific:  
 1. Received by: \_\_\_\_\_ Date: 9-19-03  
 Time: 09:00  
 2. Received by: Maureen D. Farrell  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 3. Received by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

Comments:

**STL Cooler Receipt Form/Narrative**  
**North Canton Facility**

Lot Number: 135180180

Client: Shaw Project: PBOW Quote#: \_\_\_\_\_  
 Cooler Received on: 9-18-03 Opened on: 9-18-03 by: [Signature]  
 (Signature)

Fedx  Client Drop Off  UPS  Airborne  Other: \_\_\_\_\_  
 Cooler  Safe  Foam Box  Client Cooler  Other: \_\_\_\_\_

STL Shipper No#: \_\_\_\_\_

1. Were custody seals on the outside of the cooler? Yes  No   
 IF YES, Quantity 2 Location Over seal  
 Were the custody seals signed and dated? Yes  No  NA
  2. Shipper's packing slip attached to this form? Yes  No  NA
  3. Were custody papers included inside the cooler and relinquished? Yes  No
  4. Did you sign the custody papers in the appropriate place? Yes  No
  5. Packing material used:  
 Peanuts  Bubble Wrap  Vermiculite  Foam  None  Other: \_\_\_\_\_
  6. Cooler temperature upon receipt 3.8 °C (see back of form for multiple coolers/temp)  
 METHOD: Temp Vial  Coolant & Sample  Against Bottles  IR  ICE/H<sub>2</sub>O Slurry   
 COOLANT: Wet Ice  Blue Ice  Dry Ice  Water  None
  7. Did all bottles arrive in good condition (Unbroken)? Yes  No
  8. Did all bottle labels and tags agree with the custody papers? Yes  No
  9. Were samples at the correct pH? (record on back) Yes  No  NA
  10. Were correct bottles used for the tests indicated? Yes  No
  11. Were air bubbles >6 mm in any VOA vials? Yes  No  NA
  12. Was a sufficient amount of sample sent in each bottle? Yes  No
- Contacted PM \_\_\_\_\_ Date: \_\_\_\_\_ by: \_\_\_\_\_ via Voice Mail  Verbal  Other

Concerning:

MACRO  MACRO

**1. CHAIN OF CUSTODY**

SR1A The chain of custody and sample bottles did not agree. The following discrepancies occurred \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**2. SAMPLE CONDITION**

SR2A Sample(s) \_\_\_\_\_ were received or requested after the recommended holding time had expired.  
 SR2B Sample(s) \_\_\_\_\_ were received with insufficient volume.  
 SR2C Sample(s) \_\_\_\_\_ were received in a broken container.

**3. SAMPLE PRESERVATION**

SR3A Sample(s) \_\_\_\_\_ were further preserved in sample receiving to meet recommended pH level(s).  
*Nitric Acid Lot # 061603-HNO<sub>3</sub>; Sulfuric Acid Lot # 112801-H<sub>2</sub>SO<sub>4</sub>; Sodium Hydroxide Lot # 011102-NaOH; Hydrochloric Acid Lot # 100902-HCl; Sodium Hydroxide and Zinc Acetate Lot # 112801-CH<sub>3</sub>COO<sub>2</sub>Zn/NaOH*  
 SR3B Sample(s) \_\_\_\_\_ were received with bubble > 6 mm in diameter (cc: PM)

**4. Other (see below or back)**

**Attachment 3**

**Project Data**

[USER\_TEST\_GROUP] = VOLATILES

LOCATION_CODE			PBOW PB044	PBOW PB044	PBOW-F19588	
SAMPLE_NO			DC3003	DC3006	DC3007	
SAMPLE_DATE			18-Sept-03	18-Sept-03	18-Sept-03	
SAMPLE_PURPOSE			REG	FD	FS	
<u>Parameter</u>	<u>Units</u>	<u>Filtered</u>	<u>Result</u>	<u>Qual</u>	<u>Result</u>	<u>Qual</u>
Acetone	ug/L	N	10U	10U	50U	
Benzene	ug/L	N	1U	1U	1U	
Bromodichloromethane	ug/L	N	1U	1U	2U	
Bromoform	ug/L	N	1U	1U	2U	
Bromomethane	ug/L	N	2U	2U		
Butanone, 2-	ug/L	N	5U	5U		
Carbon disulfide	ug/L	N	1U	0.11 J	2U	
Carbon tetrachloride	ug/L	N	1U	1U	2U	
Chlorobenzene	ug/L	N	1U	1U	2U	
Chloroethane	ug/L	N	2U	2U	5U	
Chloroform	ug/L	N	1U	1U	2U	
Chloromethane	ug/L	N	2U	2U		
Dibromochloromethane	ug/L	N	1U	1U	2U	
Dichloroethane, 1,1-	ug/L	N	1U	1U	2U	
Dichloroethane, 1,2-	ug/L	N	1U	1U	2U	
Dichloroethene, 1,1-	ug/L	N	1U	1U	2U	
Dichloroethene, 1,2-	ug/L	N	1U	1U		
Dichloroethene, cis-1,2-	ug/L	N			2U	
Dichloroethene, trans-1,2-	ug/L	N			2U	
Dichloropropane, 1,2-	ug/L	N	1U	1U	2U	
Dichloropropene, cis-1,3-	ug/L	N	1U	1U	2U	
Dichloropropene, trans-1,3-	ug/L	N	1U	1U	2U	
Ethylbenzene	ug/L	N	1U	1U	2U	
Hexanone, 2-	ug/L	N	5U	5U	10U	
Methyl bromide	ug/L	N			2U	
Methyl chloride	ug/L	N			2U	
Methyl-2-pentanone, 4-	ug/L	N	5U	5U	10U	
Methyl ethyl ketone	ug/L	N			10U	
Methylene chloride	ug/L	N	2U	2U	5U	
Styrene	ug/L	N	1U	1U	2U	
Tetrachloroethane, 1,1,2,2-	ug/L	N	1U	1U	2U	
Tetrachloroethene	ug/L	N	1U	1U	2U	
Toluene	ug/L	N	1U	1U	2U	
Trichloroethane, 1,1,1-	ug/L	N	1U	1U	2U	
Trichloroethane, 1,1,2-	ug/L	N	1U	1U	2U	
Trichloroethene	ug/L	N	1U	1U	2U	
Vinyl chloride	ug/L	N	1U	1U	1U	
Xylenes, total	ug/L	N	1U	1U	6U	

[USER\_TEST\_GROUP] = EXPLOSIVES

LOCATION_CODE			PBOW PB044	PBOW PB044	PBOW-F19588	
SAMPLE_NO			DC3003	DC3006	DC3007	
SAMPLE_DATE			18-Sept-03	18-Sept-03	18-Sept-03	
SAMPLE_PURPOSE			REG	FD	FS	
<u>Parameter</u>	<u>Units</u>	<u>Filtered</u>	<u>Result</u>	<u>Qual</u>	<u>Result</u>	<u>Qual</u>
Amino-2,6-dinitrotoluene, 4-	ug/L	N	0.2	U	0.2	U
Amino-4,6-dinitrotoluene, 2-	ug/L	N	0.2	U	0.2	U
Dinitrobenzene, 1,3-	ug/L	N	0.2	U	0.2	U
Dinitrotoluene, 2,4-	ug/L	N	0.2	U	0.2	U
Dinitrotoluene, 2,6-	ug/L	N	0.2	U	0.2	U
HMX	ug/L	N	0.5	U	0.5	U
Nitrobenzene	ug/L	N	0.2	U	0.2	U
Nitrotoluene, 2-	ug/L	N	0.2	U	0.2	U
Nitrotoluene, 3-	ug/L	N	0.2	U	0.2	U
Nitrotoluene, 4-	ug/L	N	0.2	U	0.2	U
RDX	ug/L	N	0.5	U	0.5	U
Tetryl	ug/L	N	0.2	U	0.2	U
Trinitrobenzene, 1,3,5-	ug/L	N	0.2	U	0.2	U
Trinitrotoluene, 2,4,6-	ug/L	N	0.2	U	0.2	U

[USER\_TEST\_GROUP] = SEMIVOLATILES

LOCATION_CODE			PBOW PB044	PBOW PB044	PBOW-F19588
SAMPLE_NO			DC3003	DC3006	DC3007
SAMPLE_DATE			18-Sept-03	18-Sept-03	18-Sept-03
SAMPLE_PURPOSE			REG	FD	FS
<u>Parameter</u>	<u>Units</u>	<u>Filtered</u>	<u>Result Qual</u>	<u>Result Qual</u>	<u>Result Qual</u>
Acenaphthene	ug/L	N	10U	10U	4.9U
Acenaphthylene	ug/L	N	10U	10U	4.9U
Anthracene	ug/L	N	10U	10U	4.9U
Benzoic acid	ug/L	N			2.4U
Benzo(a)anthracene	ug/L	N	10U	10U	4.9U
Benzo(a)pyrene	ug/L	N	10U	10U	4.9U
Benzo(b)fluoranthene	ug/L	N	10U	10U	4.9U
Benzo(ghi)perylene	ug/L	N	10U	10U	4.9U
Benzo(k)fluoranthene	ug/L	N	10U	10U	4.9U
Bis(2-chloroethoxy)methane	ug/L	N	10U	10U	4.9U
Bis(2-chloroethyl)ether	ug/L	N	10U	10U	4.9U
Bis(2-chloroisopropyl)ether	ug/L	N	10U	10U	4.9U
Bis(2-ethylhexyl)phthalate	ug/L	N	10U	10U	4.9U
Bromophenyl phenyl ether, 4-	ug/L	N	10U	10U	4.9U
Butyl benzyl phthalate	ug/L	N	10U	10U	4.9U
Carbazole	ug/L	N	10U	10U	4.9U
Chloro-3-methylphenol, 4-	ug/L	N	10U	10U	4.9U
Chloroaniline, 4-	ug/L	N	10U	10U	4.9U
Chloronaphthalene, 2-	ug/L	N	10U	10U	4.9U
Chlorophenol, 2-	ug/L	N	10U	10U	4.9U
Chlorophenyl phenyl ether, 4-	ug/L	N	10U	10U	4.9U
Chrysene	ug/L	N	10U	10U	4.9U
Di-n-butyl phthalate	ug/L	N	10U	10U	4.9U
Di-n-octyl phthalate	ug/L	N	10U	10U	4.9U
Dibenz(a,h)anthracene	ug/L	N	10U	10U	4.9U
Dibenzofuran	ug/L	N	10U	10U	4.9U
Dinitro-o-cresol,4,6-	ug/L	N			9.7U
Dichlorobenzene, 1,2-	ug/L	N	10U	10U	4.9U
Dichlorobenzene, 1,3-	ug/L	N	10U	10U	4.9U
Dichlorobenzene, 1,4-	ug/L	N	10U	10U	4.9U
Dichlorobenzidine, 3,3'-	ug/L	N	50U	50U	9.7U
Dichlorophenol, 2,4-	ug/L	N	10U	10U	4.9U
Diethyl phthalate	ug/L	N	10U	10U	4.9U
Dimethyl phthalate	ug/L	N	10U	10U	4.9U
Dimethylphenol, 2,4-	ug/L	N	10U	10U	4.9U
Dinitro-2-methylphenol, 4,6-	ug/L	N	50U	50U	9.7U
Dinitrophenol, 2,4-	ug/L	N	50U	50U	24U
Dinitrotoluene, 2,4-	ug/L	N	10U	10U	4.9U
Dinitrotoluene, 2,6-	ug/L	N	10U	10U	4.9U

Fluoranthene	ug/L	N	10U	10U	4.9U
Fluorene	ug/L	N	10U	10U	4.9U
Hexachlorobenzene	ug/L	N	10U	10U	4.9U
Hexachlorobutadiene	ug/L	N	10U	10U	4.9U
Hexachlorocyclopentadiene	ug/L	N	50U	50U	4.9U
Hexachloroethane	ug/L	N	10U	10U	4.9U
Indeno(1,2,3-cd)pyrene	ug/L	N	10U	10U	4.9U
Isophorone	ug/L	N	10U	10U	4.9U
Methylnaphthalene, 2-	ug/L	N	10U	10U	4.9U
Methylphenol, 2-	ug/L	N	10U	10U	4.9U
Methylphenol, 4-	ug/L	N	10U	10U	4.9U
Methylphenol, 3- and 4-	ug/L	N			4.9U
n-Nitroso-di-n-propylamine	ug/L	N	10U	10U	4.9U
n-Nitrosodiphenylamine	ug/L	N	10U	10U	4.9U
Naphthalene	ug/L	N	10U	10U	4.9U
Nitroaniline, 2-	ug/L	N	50U	50U	4.9U
Nitroaniline, 3-	ug/L	N	50U	50U	4.9U
Nitroaniline, 4-	ug/L	N	50U	50U	4.9U
Nitrobenzene	ug/L	N	10U	10U	4.9U
Nitrophenol, 2-	ug/L	N	10U	10U	4.9U
Nitrophenol, 4-	ug/L	N	50U	50U	24U
Pentachlorophenol	ug/L	N	50U	50U	24U
Phenanthrene	ug/L	N	10U	10U	4.9U
Phenol	ug/L	N	10U	10U	4.9U
Pyrene	ug/L	N	10U	10U	4.9U
Trichlorobenzene, 1,2,4-	ug/L	N	10U	10U	4.9U
Trichlorophenol, 2,4,5-	ug/L	N	10U	10U	4.9U
Trichlorophenol, 2,4,6-	ug/L	N	10U	10U	4.9U

[USER\_TEST\_GROUP] = METALS

LOCATION_CODE			PBOW PB044	PBOW PB044	PBOW-F19588
SAMPLE_NO			DC3003	DC3006	DC3007
SAMPLE_DATE			18-Sept-03	18-Sept-03	18-Sept-03
SAMPLE_PURPOSE			REG	FD	FS
<u>Parameter</u>	<u>Units</u>	<u>Filtered</u>	<u>Result Qual</u>	<u>Result Qual</u>	<u>Result Qual</u>
Aluminum	ug/L	N	86.5 B	88.6 B	69 U
Aluminum	ug/L	Y	61.8 B	72.8 B	69 U
Antimony	ug/L	N	60 U	60 U	2.1 U
Antimony	ug/L	Y	60 U	60 U	2.1 U
Arsenic	ug/L	N	10 U	10 U	3.1 U
Arsenic	ug/L	Y	10 U	10 U	3.1 U
Barium	ug/L	N	177 B	172 B	162 B
Barium	ug/L	Y	177 B	174 B	167 B
Beryllium	ug/L	N	5 U	5 U	0.5 U
Beryllium	ug/L	Y	5 U	5 U	0.5 U
Cadmium	ug/L	N	5 U	5 U	0.4 U
Cadmium	ug/L	Y	5 U	5 U	0.4 U
Calcium	ug/L	N	159000	156000	151000
Calcium	ug/L	Y	158000	157000	152000
Chromium	ug/L	N	10 U	10 U	1.7 U
Chromium	ug/L	Y	10 U	10 U	1.7 U
Cobalt	ug/L	N	50 U	50 U	0.6 U
Cobalt	ug/L	Y	50 U	50 U	0.6 U
Copper	ug/L	N	25 U	25 U	1 U
Copper	ug/L	Y	25 U	25 U	1 U
Iron	ug/L	N	156	142	367
Iron	ug/L	Y	92.7 B	99.1 B	320
Lead	ug/L	N	12 U	13 U	1.4 U
Lead	ug/L	Y	13 U	13 U	1.4 U
Magnesium	ug/L	N	62000	60600	57500
Magnesium	ug/L	Y	61400	60500	57800
Manganese	ug/L	N	72.9	70.9	65.1
Manganese	ug/L	Y	71.5	71.2	64.7
Mercury	ug/L	N	0.2 U	0.2 U	0.052 U
Mercury	ug/L	Y	0.2 U	0.2 U	0.052 U
Nickel	ug/L	N	40 U	40 U	1.1 U
Nickel	ug/L	Y	40 U	40 U	1.1 U
Potassium	ug/L	N	12100	11800	12800
Potassium	ug/L	Y	11900	11500	12800
Selenium	ug/L	N	5 U	5 U	15 U
Selenium	ug/L	Y	5 U	5 U	3.1 U
Silver	ug/L	N	10 U	10 U	1.8 U
Silver	ug/L	Y	10 U	10 U	1.8 U
Sodium	ug/L	N	120000	116000	115000

Sodium	ug/L	Y	118000	115000	115000
Thallium	ug/L	N	3.1BJ	8.3BJ	3.3U
Thallium	ug/L	Y	10U	6.9BJ	3.3U
Vanadium	ug/L	N	50U	50U	0.9U
Vanadium	ug/L	Y	50U	50U	0.9U
Zinc	ug/L	N	4.8B	20U	8U
Zinc	ug/L	Y	2.6B	20U	8U