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December 20, 2004

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

Submittal of Chemical Quality Assurance Reports 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 June 2004.

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

Groundwater Investigations

June 2004

Plum Brook Ordnance Works

Sandusky, Ohio

Prepared for the Shaw Group

By

DataChek



September 14, 2004

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**Chemical Quality Assurance Report
Groundwater Investigations
June 2004
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 investigation program, June 2004, 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 four 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) groundwater investigations, June 2004, 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 CQAR 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	DG3003	17-June-04	REG	PB0471	STL
	DG3006		FD	PB047	STL
	DG3007		FS	F24891	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 75 comparisons for 16 different compounds or elements were made and six (8.0%) of the sample pairs were designated as disagreements and none as major disagreements.

Accuracy: Contamination in the volatiles' method and trip blanks resulted in a "B" qualifier for acetone in the project and field duplicate samples. Also, contamination in the metals' method blank resulted in thallium being qualified as "B" in both the total and dissolved fractions for the project and field QA samples and Zn in DG3003T and DG3006T.

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* (July 2002) 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. Acetone was found in the method blank (MB) associated with samples DG3003 and DG3006. The compound was present in the samples at levels <10x the blank and a “B” qualifier were required. Acetone was also present in the trip blank.

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 for all samples 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 standard area count recoveries and retention times met the QC criteria

Field Duplicates (FD). All field duplicate results were within the QC limits.

Quantitation. All results were acceptable 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 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.

Field Duplicates (FD). All field duplicate results were within the QC limits.

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 were within the QC limits and no qualifiers were required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD). The MS/MSD analyses for DG3003 and DG3006 were acceptable within QC limits. The MS/MSD recoveries associated with DG3007 had recoveries below the lower QC limit for 2,4-dimethylphenol but no qualifiers were added since the LCS was acceptable.

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.

Field Duplicates (FD). All field duplicate results were within the QC limits.

Quantitation. All results were acceptable as reported by the laboratory.

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. Thallium was present in the method blanks for the total and dissolved fractions for DG3003 and DG3006. All results were qualified as “B”. Zn was also in the blank and was qualified as “B” in DG3003T and DG3006T.

Matrix Spike/Matrix Spike Duplicate (MS/MSD). The MS/MSD recoveries were acceptable with no qualifiers required.

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	DG3006T	potassium, sodium	J

Field Duplicate. Zinc had a high RPD in the field duplicate analysis but was already qualified as “B” due to blank contamination.

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.

Data comparisons were appropriate in 25 cases for 16 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 no major disagreements (MD) and six disagreements (D).

Carbon disulfide and acetone were the only two volatile organic compounds detected in the samples. Carbon disulfide was present in all three samples while acetone was present in the project and field duplicate samples, but not in the FS. The data comparisons were acceptable for both compounds

The explosives and semivolatiles had no comparisons since all the results were nondetects.

Of the 23 instances where the comparison criteria was applied to the metals results, nine involved comparisons where one value was a nondetect, and 14 where all values were detects. Six cases were categorized as disagreements and none as major disagreements.

Five of the disagreement designations involved situations where there was one or two nondetects that had RLs or MDLs at differences greater than 3x the detected value. In the case of zinc, where all results were detects, the difference between the FD and FS results were greater than 2x.

Table 2: Data Comparison: Volatiles

Location Code	Detected Analyte ¹	Project Sample Sample No/ Date Result/Qual/Code ²	Field Duplicate Sample No./Date Result/Qual/Code ²	Field Split Sample No./Date Result/Qual/Code ²	PS/FD ³	PS/FS ³	FD/FS ³
PBOW		DG3003 17-June-04	DG3006 17-June-04	DG3007 17-June-04			
	carbon disulfide	1.9	1.9	2.0	A	A	A
	acetone	4.9 B 6a	4.9 B 6a	5.0 U	A	A	A

Table 3: Data Comparison: Explosives

Location Code	Detected Analyte ¹	Project Sample Sample No/ Date Result/Qual/Code ²	Field Duplicate Sample No./Date Result/Qual/Code ²	Field Split Sample No./Date Result/Qual/Code ²	PS/FD ³	PS/FS ³	FD/FS ³
PBOW		DG3003 17-June-04	DG3006 17-June-04	DG3007 17-June-04			
	No detected compounds						

Table 4: Data Comparison: Semivolatiles

Location Code	Detected Analyte ¹	Project Sample Sample No/ Date Result/Qual/Code ²	Field Duplicate Sample No./Date Result/Qual/Code ²	Field Split Sample No./Date Result/Qual/Code ²	PS/FD ³	PS/FS ³	FD/FS ³
PBOW		DG3003 17-June-04	DG3006 17-June-04	DG3007 17-June-04			
	No compounds detected						

Table 5: Data Comparison: Metals

Location Code	Detected Analyte ¹	Project Sample Sample No./Date Result/Qual/Code ²	Field Duplicate Sample No./ Date Result/Qual/Code ²	Field Split Sample No./Date Result/Qual/Code ²	PS/FD ³	PS/FS ³	FD/FS ³
PBOW		DG3003 17-June-04	DG3006 17-June-04	DG3007 17-June-04			
	Aluminum T	84.8	77.1	43.0	A	A	A
	Aluminum D	200 U	200 U	20 U	A	D	D
	Arsenic T	10 U	10 U	6.1 J	A	A	A
	Arsenic D	10 U	10 U	5.1 J	A	A	A
	Antimony D	10 U	10 U	5.0	A	A	A
	Barium T	112	111	106	A	A	A
	Barium D	117	118	116	A	A	A
	Calcium T	194000	192000	194000	A	A	A
	Calcium D	193000	195000	197000	A	A	A
	Iron T	104	98.4 J	48 U	A	A	A
	Magnesium T	70400	69600	71700	A	A	A
	Magnesium D	70200	70900	72300	A	A	A
	Manganese T	105	104	103	A	A	A
	Manganese D	103	104	101	A	A	A
	Mercury D	0.06 J	0.2 U	0.05 U	D	A	D
	Potassium T	10800	10700	13100 J 13	A	A	A
	Potassium D	10900	10900	13100 J 13	A	A	A
	Selenium T	1.5 J	5.0 U	3.6 U	D	A	A
	Sodium T	67000	66300	68300 J 13	A	A	A
	Sodium D	67700	68400	70200 J 13	A	A	A
	Thallium T	5.2 B 6a	4.4 B 6a	2.9 U	A	A	A
	Thallium D	10 U	5.8 B 6a	2.9 U	A	A	A
	Zinc T	5.1 B 6a	3.6 J	8.0 J			D

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: <ol style="list-style-type: none">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

Reason Code	Definition
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 judgment 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

STL Accutest.
SDG: PB047/F24891 Project: Plum Brook Ordnance Works

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

Validation Samples: DG3003 DG3007
DG3006

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>X</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>N/A</u>	<u></u>
12. System Performance	<u>A</u>	<u></u>
13. Field QC Samples	<u>X</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:

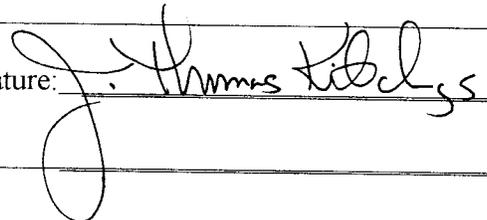
GC • Contamination in the ^{JTK and trip} method blank resulted in a "B" qualifier for acetone in sample DG3003, and DG3006.

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified.

Validator's Signature:



Date: 9/10/2004

Peer Reviewer:

Date:

SHAW B & I INC

Client Sample ID: DG3006

GC/MS Volatiles

Lot-Sample #...: H4F190139-003
 Date Sampled...: 06/17/04
 Prep Date.....: 06/21/04
 Prep Batch #...: 4173232
 Dilution Factor: 1

Work Order #...: GJMR01AF
 Date Received...: 06/19/04
 Analysis Date...: 06/21/04

Matrix.....: WATER

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING			MDL	Rev Incl
		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	4.0 J,B	10	ug/L	1.4	B	6a
Carbon disulfide	1.9	1.0	ug/L	0.10		
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	97	(79 - 120)				
1,2-Dichloroethane-d4	98	(71 - 127)				
Toluene-d8	80	(80 - 120)				
Bromofluorobenzene	98	(69 - 126)				

(Continued on next page)

Report of Analysis

Client Sample ID:	DG3007	Date Sampled:	06/17/04
Lab Sample ID:	F24891-1	Date Received:	06/18/04
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	PBOW		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0029446.D	1	07/01/04	JG	n/a	n/a	VG1102
Run #2							

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

VOA TCL List

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

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DG3007	Date Sampled:	06/17/04
Lab Sample ID:	F24891-1	Date Received:	06/18/04
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	PBOW		

VOA TCL List

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		86-115%
17060-07-0	1,2-Dichloroethane-D4	109%		73-126%
2037-26-5	Toluene-D8	92%		86-112%
460-00-4	4-Bromofluorobenzene	100%		83-119%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

**DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plumbrook F24891
SDG: PK247 Matrix/No. Samples: W-2

I. Technical Holding Times									
A. Sample Preservation, Handling and Transport									
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 °)?	<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						
Coolers @ 2.3°C. 3003 3006 3007 2.8°C									
B. Chain of Custody									
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						
C. Holding Times									
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;"> <tr> <td style="width: 33%; text-align: center;">SAMPLED</td> <td style="width: 33%; text-align: center;">PREPPED</td> <td style="width: 33%; text-align: center;">ANALYZED</td> </tr> <tr> <td style="vertical-align: top;"> 3003 3006 6/17 3007 6/17 </td> <td></td> <td style="vertical-align: top;"> 6/21 7/1 </td> </tr> </table>				SAMPLED	PREPPED	ANALYZED	3003 3006 6/17 3007 6/17		6/21 7/1
SAMPLED	PREPPED	ANALYZED							
3003 3006 6/17 3007 6/17		6/21 7/1							
II. GC/MS Instrument Performance Check									
1. Were instrument performance check samples run for each analysis period?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A						
2. Were ion abundance criteria met for bromofluorobenzene (BFB) analysis?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A						
3. Do laboratory forms match raw data?	Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A						
4. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A						
Comments/Qualifications: 3007 CCAL 6/29 IIAL 7/1 45 base. → criteria met.									

**DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plumbrook SDG: P24891
PB047 Matrix/No. Samples: W-2

III. Initial Calibration			
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 ≥ 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
Comments/Qualifications: ICAL 6/29 All target RRFs ≥ 0.05 RSDs 17 db-3 cp @ 33.1 nondet. - no qual.			
IV. Continuing Calibration			
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) ≥ 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
Comments/Qualifications: CCALS 7/1 RRF ≥ 0.05 %D $\leq 35\%$			

**DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plumbrook SDG: F24891
PB047 Matrix/No. Samples: W-2

VIII. Laboratory Control Sample (LCS)			
1. Were LCS samples run at correct frequency for each matrix samples?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. <u>Were LCS calculations performed correctly, and did laboratory reported values match raw data? Were recoveries within laboratory QC limits?</u>	<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?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<p>Comments/Qualifications:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>3003 FIAC 3006 6/21 Range of R's. 84-98</p> </div> <div style="width: 45%;"> <p>→ benzene. $\frac{9.28}{10} = 92.8\%$</p> </div> </div> <div style="display: flex; justify-content: flex-end; margin-top: 10px;"> <p>3007 7/1 86-126 Ethyl b. $\frac{24}{25} = 95\%$ 96.1%</p> </div>			
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	<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?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
<p>Comments/Qualifications:</p> <p>IS-3007</p> <p>IS2 $\frac{962167}{872240} = 110.3\%$</p> <p>RT $\frac{14.86}{14.85}$</p>			
X. Target Compound Identification			
1. Are relative retention times (RRTs) within + or - 0.06 RRT units of standard RRT?	<input type="radio"/> 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?	<input type="radio"/> Yes	<input type="radio"/> No	N/A
3. Were all compounds accounted for on chromatogram?	<input type="radio"/> Yes	<input type="radio"/> No	N/A
<p>Comments/Qualifications: No raw data - level III</p>			

**DATA VALIDATION WORKSHEETS
VOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plumbrook SDG: E24891
PB047 Matrix/No. Samples: W-2

XI. Compound Quantitation and Reported Contract Required Quantitation Limits (CRQLs)			
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
Comments/Qualifications: <i>No raw data</i>			
XII. Field QC			
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
<p>Comments/Qualifications:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>TB 5002 3003</p> <hr style="width: 50%; margin-left: 0;"/> <p>MCC @ 0.46</p> <p>Acet @ 4.1</p> </div> <div style="width: 30%; text-align: center;"> <p>3003</p> <p>4.9 Acet.</p> <p>1.9</p> </div> <div style="width: 30%; text-align: center;"> <p>3006</p> <p>4.0 - u from MB</p> <p>1.9 no add'l qual's</p> </div> </div> <p style="text-align: center; margin-top: 10px;">TB5003 all nondetect₂</p> <div style="text-align: right; margin-top: 10px;"> $\frac{.9}{4.45} = 20.2\%$ </div>			
XIII. Overall Assessment of Data			
1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	No	N/A
Comments/Qualifications:			

SDG: SR PB047 / F24891 Project: Plum Brook Ordnance Works

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

Validation Samples: DG3003
DG3006
DG3007

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>N/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>

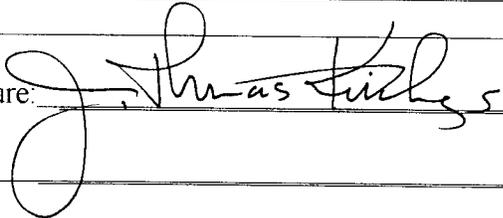
Status Codes:
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as reported.

Validator's Signature:  Date: 9/10/2004
Peer Reviewer: _____ Date: _____

SHAW E & I INC

Client Sample ID: DG3003

GC/MS Semivolatiles

Lot-Sample #...: H4F190139-001 Work Order #...: GJM11AH Matrix.....: WATER
 Date Sampled...: 06/17/04 Date Received...: 06/19/04
 Prep Date.....: 06/21/04 Analysis Date...: 06/23/04
 Prep Batch #...: 4173090
 Dilution Factor: 1 Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING			MDL	<i>Re Qual</i>
		LIMIT	UNITS			
Phenol	ND	10	ug/L	1.8	<i>u</i>	
bis(2-Chloroethyl)- ether	ND	10	ug/L	1.6		
2-Chlorophenol	ND	10	ug/L	1.2	<i>u</i>	
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: DG3003

GC/MS Semivolatiles

Lot-Sample #...: H4F190139-001 Work Order #...: GJM1AH Matrix.....: WATER

PARAMETER	RESULT	REPORTING			MDL	Req Qual
		LIMIT	UNITS			
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		
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>				
2-Fluorophenol	56	(36 - 98)				
Phenol-d5	69	(49 - 109)				
Nitrobenzene-d5	81	(57 - 120)				
2-Fluorobiphenyl	83	(56 - 118)				
2,4,6-Tribromophenol	71	(55 - 134)				
Terphenyl-d14	87	(33 - 142)				

SHAW E & I INC

Client Sample ID: DG3006

GC/MS Semivolatiles

Lot-Sample #...: H4F190139-003 Work Order #...: GJMR01AG Matrix.....: WATER
 Date Sampled...: 06/17/04 Date Received...: 06/19/04
 Prep Date.....: 06/21/04 Analysis Date...: 06/23/04
 Prep Batch #...: 4173090
 Dilution Factor: 1 Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING		MDL	<i>Revised</i>
		LIMIT	UNITS		
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: DG3006

GC/MS Semivolatiles

Lot-Sample #...: H4F190139-003 Work Order #...: GJMR01AG Matrix.....: WATER

PARAMETER	RESULT	REPORTING			MDL	Raw Quel u
		LIMIT	UNITS			
3-Nitroaniline	ND	50	ug/L		1.3	↓
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	(36 - 98)
Phenol-d5	67	(49 - 109)
Nitrobenzene-d5	79	(57 - 120)
2-Fluorobiphenyl	77	(56 - 118)
2,4,6-Tribromophenol	69	(55 - 134)
Terphenyl-d14	84	(33 - 142)

Report of Analysis

Client Sample ID: DG3007	Date Sampled: 06/17/04
Lab Sample ID: F24891-1	Date Received: 06/18/04
Matrix: AQ - Ground 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	W020397.D	1	06/22/04	ME	06/21/04	OP10727	SW1071
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

ABN TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q	Rev Qual
65-85-0	Benzoic Acid	ND	24	14	ug/l		✓
95-57-8	2-Chlorophenol	ND	4.8	1.9	ug/l		
59-50-7	4-Chloro-3-methyl phenol	ND	4.8	1.9	ug/l		
120-83-2	2,4-Dichlorophenol	ND	4.8	1.9	ug/l		
105-67-9	2,4-Dimethylphenol	ND	4.8	1.9	ug/l		
51-28-5	2,4-Dinitrophenol	ND	24	9.5	ug/l		
534-52-1	4,6-Dinitro-o-cresol	ND	9.5	4.8	ug/l		
95-48-7	2-Methylphenol	ND	4.8	1.9	ug/l		
	3&4-Methylphenol	ND	4.8	1.9	ug/l		
88-75-5	2-Nitrophenol	ND	4.8	1.9	ug/l		
100-02-7	4-Nitrophenol	ND	24	9.5	ug/l		
87-86-5	Pentachlorophenol	ND	24	9.5	ug/l		
108-95-2	Phenol	ND	4.8	1.9	ug/l		
95-95-4	2,4,5-Trichlorophenol	ND	4.8	1.9	ug/l		
88-06-2	2,4,6-Trichlorophenol	ND	4.8	1.9	ug/l		
83-32-9	Acenaphthene	ND	4.8	0.95	ug/l		
208-96-8	Acenaphthylene	ND	4.8	0.95	ug/l		
120-12-7	Anthracene	ND	4.8	0.95	ug/l		
56-55-3	Benzo(a)anthracene	ND	4.8	0.95	ug/l		
50-32-8	Benzo(a)pyrene	ND	4.8	0.95	ug/l		
205-99-2	Benzo(b)fluoranthene	ND	4.8	0.95	ug/l		
191-24-2	Benzo(g,h,i)perylene	ND	4.8	1.9	ug/l		
207-08-9	Benzo(k)fluoranthene	ND	4.8	0.95	ug/l		
101-55-3	4-Bromophenyl phenyl ether	ND	4.8	0.95	ug/l		
85-68-7	Butyl benzyl phthalate	ND	4.8	1.9	ug/l		
100-51-6	Benzyl Alcohol	ND	4.8	0.95	ug/l		
91-58-7	2-Chloronaphthalene	ND	4.8	0.95	ug/l		
106-47-8	4-Chloroaniline	ND	9.5	2.9	ug/l		
86-74-8	Carbazole	ND	4.8	0.95	ug/l		
218-01-9	Chrysene	ND	4.8	0.95	ug/l		
111-91-1	bis(2-Chloroethoxy)methane	ND	4.8	0.95	ug/l		
111-44-4	bis(2-Chloroethyl)ether	ND	4.8	1.9	ug/l		

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DG3007	Date Sampled:	06/17/04
Lab Sample ID:	F24891-1	Date Received:	06/18/04
Matrix:	AQ - Ground 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	4.8	0.95	ug/l			
7005-72-3	4-Chlorophenyl phenyl ether	ND	4.8	0.95	ug/l			
95-50-1	1,2-Dichlorobenzene	ND	4.8	0.95	ug/l			
541-73-1	1,3-Dichlorobenzene	ND	4.8	0.95	ug/l			
106-46-7	1,4-Dichlorobenzene	ND	4.8	0.95	ug/l			
121-14-2	2,4-Dinitrotoluene	ND	4.8	1.9	ug/l			
606-20-2	2,6-Dinitrotoluene	ND	4.8	1.9	ug/l			
91-94-1	3,3'-Dichlorobenzidine	ND	9.5	4.8	ug/l			
53-70-3	Dibenzo(a,h)anthracene	ND	4.8	1.9	ug/l			
132-64-9	Dibenzofuran	ND	4.8	0.95	ug/l			
84-74-2	Di-n-butyl phthalate	ND	4.8	1.9	ug/l			
117-84-0	Di-n-octyl phthalate	ND	4.8	2.4	ug/l			
84-66-2	Diethyl phthalate	ND	4.8	1.9	ug/l			
131-11-3	Dimethyl phthalate	ND	4.8	1.9	ug/l			
117-81-7	bis(2-Ethylhexyl)phthalate	ND	4.8	2.4	ug/l			
206-44-0	Fluoranthene	ND	4.8	0.95	ug/l			
86-73-7	Fluorene	ND	4.8	0.95	ug/l			
118-74-1	Hexachlorobenzene	ND	4.8	0.95	ug/l			
87-68-3	Hexachlorobutadiene	ND	4.8	1.9	ug/l			
77-47-4	Hexachlorocyclopentadiene	ND	4.8	1.9	ug/l			
67-72-1	Hexachloroethane	ND	4.8	1.9	ug/l			
193-39-5	Indeno(1,2,3-cd)pyrene	ND	4.8	1.9	ug/l			
78-59-1	Isophorone	ND	4.8	0.95	ug/l			
91-57-6	2-Methylnaphthalene	ND	4.8	0.95	ug/l			
88-74-4	2-Nitroaniline	ND	4.8	1.9	ug/l			
99-09-2	3-Nitroaniline	ND	4.8	1.9	ug/l			
100-01-6	4-Nitroaniline	ND	4.8	1.9	ug/l			
91-20-3	Naphthalene	ND	4.8	0.95	ug/l			
98-95-3	Nitrobenzene	ND	4.8	0.95	ug/l			
621-64-7	N-Nitroso-di-n-propylamine	ND	4.8	1.9	ug/l			
86-30-6	N-Nitrosodiphenylamine	ND	4.8	1.9	ug/l			
85-01-8	Phenanthrene	ND	4.8	0.95	ug/l			
129-00-0	Pyrene	ND	4.8	0.95	ug/l			
120-82-1	1,2,4-Trichlorobenzene	ND	4.8	0.95	ug/l			

Handwritten vertical line with an arrow pointing down and a checkmark at the top.

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	43%		19-90%
4165-62-2	Phenol-d5	27%		10-68%
118-79-6	2,4,6-Tribromophenol	85%		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

**DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: PB047
E24891 Matrix/No. Samples: w-3

III. Initial Calibration			
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	No	N/A
2. Were initial calibration RRFs for all volatile target compounds and system monitoring compounds ≥ 0.05 ? Do recalculations for RRFs agree with reported values?	<input checked="" type="radio"/> Yes	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	No	N/A
4. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
Comments/Qualifications: <div style="text-align: center; font-family: cursive;"> <p>6/22</p> <p>all RRFs > 0.05 RSDs $< 30\%$</p> </div>			
IV. Continuing Calibration			
1. Were continuing calibration samples run at the required frequency, and compared to the correct initial calibration?	<input checked="" type="radio"/> Yes	No	N/A
2. Did calculations from raw data agree with laboratory reported values for RRF and %D?	Yes	No	<input checked="" type="radio"/> N/A
3. Were continuing calibration RRFs for volatile organic compounds and system monitoring compounds (surrogates) ≥ 0.05 ?	<input checked="" type="radio"/> Yes	No	N/A
4. Were %D between initial calibration RRF and the continuing calibration RRFs within $\pm 25\%$?	<input checked="" type="radio"/> Yes	No	N/A
5. Were any qualifications required based on this information?	Yes	<input checked="" type="radio"/> No	N/A
Comments/Qualifications: <div style="text-align: center; font-family: cursive;"> <p>6/22</p> <p>%D's < 12 RRFs > 0.05</p> </div>			

**DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: P3047
E24891 Matrix/No. Samples: W-3

V. Blanks			
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
Comments/Qualifications: 6/23 71AA 3,6 MB - all nondetects. 3007 6/22 all u's.			
VI. System Monitoring Compounds (Surrogate Spikes)			
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
Comments/Qualifications: 3003 - 56/87% 3006 63-84% 3007 27-97%			
VII. Matrix Spikes/Matrix Spike Duplicates			
1. Were MS/MSD samples analyzed at required frequency for each ample 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
Comments/Qualifications: 6/23 MIAJ/MIAK MS - 73-96 MSD - 70-97 RPD - 1.9-7.8 1,4 dcb. $\frac{97.6}{98} = 99.6\%$ $\frac{71.8}{95.2} = 75.4\%$ 3 RPD = $\frac{5.8}{74.7} = 7.8\%$ 398 D. MS 33-100 MSD 32-103 RPD - 0-34% 2,4-dmp - low LCS - 62 no quals.			

**DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: P807 F24891 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	<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?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
Comments/Qualifications: <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <p>LCS J91AC 72-88% 7/23</p> </div> <div style="width: 30%;"> <p>2-CP $\frac{72.4}{100} = 72.4\%$</p> <p>391.D 3007 \rightarrow 17-99%</p> </div> <div style="width: 30%;"> <p>\rightarrow Fluorene $\frac{47}{50} = 94\%$</p> </div> </div>			
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	<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?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
Comments/Qualifications: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>IS4 $\frac{483187}{428377} = 112.8\%$</p> </div> <div style="text-align: center;"> <p>RT. $\frac{11.29}{11.30}$ ✓</p> </div> </div>			
X. Target Compound Identification			
1. Are relative retention times (RRTs) within + or - 0.06 RRT units of standard RRT?	<input type="radio"/> 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?	<input type="radio"/> Yes	<input type="radio"/> No	N/A
3. Were all compounds accounted for on chromatogram?	<input type="radio"/> Yes	<input type="radio"/> No	N/A
Comments/Qualifications: No raw data - level III			

**DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS**

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: D5047 F24891 Matrix/No. Samples: W-3

XI. Compound Quantitation and Reported Contract Required Quantitation Limits (CRQLs)			
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
Comments/Qualifications: <i>No raw data-level</i>			
XII. Field QC			
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
Comments/Qualifications: <i>FD 3003 3006</i> <i>u's u's</i>			
XIII. Overall Assessment of Data			
1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	<input checked="" type="radio"/> No	N/A
Comments/Qualifications:			

STL Accutest
SDG: PB047 / F24891 Project: Plum Brook

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

Validation Samples: DG 3003
DG 3006
DG 3007

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>N/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

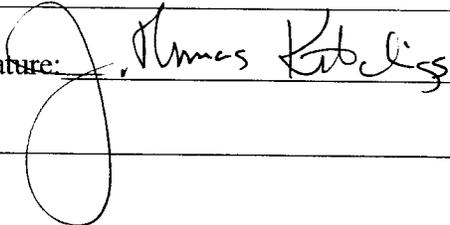
Qualifications:

Significant Findings/Recommendations:

Overall Data Quality:

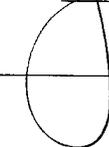
Acceptable as reported

Validator's Signature:



Date: 9/10/2004

Peer Reviewer:



Date:

SHAW E & I INC

Client Sample ID: DG3003

HPLC

Lot-Sample #...: H4F190139-001
 Date Sampled...: 06/17/04
 Prep Date...: 06/23/04
 Prep Batch #...: 4175044
 Dilution Factor: 1

Work Order #...: GJMRR1AA
 Date Received...: 06/19/04
 Analysis Date...: 06/23/04
 Method...: SW846 8330

Matrix.....: WATER

PARAMETER	RESULT	REPORTING			MDL	Req'd u
		LIMIT	UNITS			
HMX	ND	0.50	ug/L		0.082	↓
RDX	ND	0.50	ug/L		0.067	
1,3,5-Trinitrobenzene	ND	0.20	ug/L		0.049	
1,3-Dinitrobenzene	ND	0.20	ug/L		0.040	
Tetryl	ND	0.20	ug/L		0.060	
Nitrobenzene	ND	0.20	ug/L		0.049	
2,4,6-Trinitrotoluene	ND	0.20	ug/L		0.13	
4-Amino-2,6-dinitrotoluene	ND	0.20	ug/L		0.10	
2-Amino-4,6-dinitrotoluene	ND	0.20	ug/L		0.077	
2,6-Dinitrotoluene	ND	0.20	ug/L		0.073	
2,4-Dinitrotoluene	ND	0.20	ug/L		0.090	
2-Nitrotoluene	ND	0.20	ug/L		0.12	
4-Nitrotoluene	ND	0.20	ug/L		0.12	
3-Nitrotoluene	ND	0.20	ug/L		0.13	
<u>SURROGATE</u>		<u>PERCENT</u>	<u>RECOVERY</u>			
1-Chloro-3-nitrobenzene		<u>RECOVERY</u>	<u>LIMITS</u>			
		65	(52 - 139)			

SHAW E & I INC

Client Sample ID: DG3006

HPLC

Lot-Sample #....: H4F190139-003 Work Order #....: GJMR01AE Matrix.....: WATER
 Date Sampled....: 06/17/04 Date Received...: 06/19/04
 Prep Date.....: 06/23/04 Analysis Date...: 06/23/04
 Prep Batch #....: 4175044
 Dilution Factor: 1 Method.....: SW846 8330

PARAMETER	RESULT	REPORTING			MDL	Res Qual
		LIMIT	UNITS			
HMX	ND	0.50	ug/L	0.082	u ↓	
RDX	ND	0.50	ug/L	0.067		
1,3,5-Trinitrobenzene	ND	0.20	ug/L	0.049		
1,3-Dinitrobenzene	ND	0.20	ug/L	0.040		
Tetryl	ND	0.20	ug/L	0.060		
Nitrobenzene	ND	0.20	ug/L	0.049		
2,4,6-Trinitrotoluene	ND	0.20	ug/L	0.13		
4-Amino-2,6-dinitrotoluene	ND	0.20	ug/L	0.10		
2-Amino-4,6-dinitrotoluene	ND	0.20	ug/L	0.077		
2,6-Dinitrotoluene	ND	0.20	ug/L	0.073		
2,4-Dinitrotoluene	ND	0.20	ug/L	0.090		
2-Nitrotoluene	ND	0.20	ug/L	0.12		
4-Nitrotoluene	ND	0.20	ug/L	0.12		
3-Nitrotoluene	ND	0.20	ug/L	0.13		
	PERCENT	RECOVERY				
<u>SURROGATE</u>	<u>RECOVERY</u>	<u>LIMITS</u>				
1-Chloro-3-nitrobenzene	77	(52 - 139)				

Report of Analysis

Client Sample ID:	DG3007	Date Sampled:	06/17/04
Lab Sample ID:	F24891-1	Date Received:	06/18/04
Matrix:	AQ - Ground 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	GG009781.D	1	06/24/04	MRE	06/21/04	OP10730	GGG461
Run #2							

Run #	Initial Volume	Final Volume
Run #1	990 ml	10.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q	Rev Qual
2691-41-0	HMX	ND	0.20	0.076	ug/l		u
121-82-4	RDX	ND	0.20	0.076	ug/l		↓
99-65-0	1,3-Dinitrobenzene	ND	0.20	0.051	ug/l		
606-20-2	2,6-Dinitrotoluene	ND	0.20	0.051	ug/l		
121-14-2	2,4-Dinitrotoluene	ND	0.20	0.051	ug/l		
35572-78-2	2-amino-4,6-Dinitrotoluene	ND	0.20	0.051	ug/l		
19406-51-0	4-amino-2,6-Dinitrotoluene	ND	0.20	0.051	ug/l		
98-95-3	Nitrobenzene	ND	0.20	0.051	ug/l		
88-72-2	o-Nitrotoluene	ND	0.20	0.051	ug/l		
99-08-1	m-Nitrotoluene	ND	0.20	0.051	ug/l		
99-99-0	p-Nitrotoluene	ND	0.20	0.076	ug/l		
479-45-8	Tetryl	ND	0.20	0.076	ug/l		
99-35-4	1,3,5-Trinitrobenzene	ND	0.20	0.051	ug/l		
118-96-7	2,4,6-Trinitrotoluene	ND	0.20	0.051	ug/l		

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
610-39-9	3,4-Dinitrotoluene	94%		61-124%

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: 9/10

Project: Plum Brook

SDG: PP047 / F24891

Matrix/No. Samples: W-3

I. Technical Holding Times			
A. Sample Preservation, Handling and Transport			
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° 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>2.3° , 2.8° C</u>			
B. Chain of Custody			
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
C. Holding Times			
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
Sampled	Prepped	Analyzed	
<u>6/17</u>	<u>6/23</u>	<u>6/23</u>	
	<u>6/21</u>	<u>6/24</u>	
<u>3003</u>			
<u>3006</u>			
<u>3007</u>			
II. Initial Calibration			
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	No	N/A
2. For sample results calculated using initial calibration, was correct standard used for calculating sample result?	<input checked="" type="radio"/> Yes	No	N/A
3. Was calibration range within 25% of method range?	<input checked="" type="radio"/> Yes	No	N/A
4. Were retention Times (RTs) within acceptable RT windows?	<input checked="" type="radio"/> Yes	No	N/A
Comments/Qualifications:			
<u>ICAL 4/29</u>			
<u>RSDs. $\frac{1}{<112}$ $\frac{2}{<112}$</u>			

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

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: PB047/T-24891 Matrix/No. Samples: w-3

III. Continuing Calibration			
1. Were continuing calibration samples run at the required frequency, and compared to the correct initial calibration?	<input checked="" type="radio"/> Yes	No	N/A
2. Were RTs for all standard compounds in continuing calibration samples within acceptable RT window?	<input checked="" type="radio"/> Yes	No	N/A
3. Were continuing calibration recoveries within control limit of 75-125%?	<input checked="" type="radio"/> Yes	No	N/A
4. Did laboratory reported calculations and data match raw data?	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
Comments/Qualifications: 6/24 @ 4:56 $\frac{1}{10\%}$ $\frac{2}{9\%}$ $\text{Nitrob. } \frac{1000 - 952.17}{1000} = 7.83\%$			
IV. Blanks			
1. Does data package include summary of method blank results?	<input checked="" type="radio"/> Yes	No	N/A
2. Were any compounds reported in laboratory method blanks?	Yes	<input checked="" type="radio"/> No	N/A
3. Were method blank analyses performed at required frequency?	<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
Comments/Qualifications: TJIAA TJIAA 6/23 all u's, 3,6 3007 789.D 6/24 - all u's,			
V. System Monitoring Compounds (Surrogate Spikes)			
1. Were all samples spiked with correct surrogate compounds?	<input checked="" type="radio"/> Yes	No	N/A
2. Were laboratory surrogate recoveries calculated and reported correctly on data forms?	Yes	No	<input checked="" type="radio"/> N/A
3. Were surrogate recoveries within laboratory established limits?	<input checked="" type="radio"/> Yes	No	N/A
4. Were any qualifications required based on surrogate spike QC information?	Yes	<input checked="" type="radio"/> No	N/A
Comments/Qualifications: 3003 - 65% 3006 - 77% 3007 - 94%			

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

Reviewer: Kitchings

Date: 9/10

Project: Plum Brook

SDG: PB047 / F24891

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	No	N/A
2. Were MS/MSD results for recovery (+or- 40%) RPD (<30) within laboratory QC 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 matrix spike recoveries and RPDs calculated and reported correctly?	<input checked="" type="radio"/> 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
<p>Comments/Qualifications:</p> <p> <i>tetraj @ 3uo ok-LCS no qualcs.</i> RMIAC / IAD 2,4,6 trt $\frac{MS\ 2.49}{3.00} = 83\%$ 6/23 1mg. MS 67-89 MSD 80-114 RPD 15-26 MSB. $\frac{3.18}{3.00} = 106\%$ RPD = $\frac{1.69}{2.845} = 24.3\%$ 785.D 6/24 786.D 6/24 MS 98-115 RPD 0-4 MSD 98-115 4-a-2,6 dist. $\frac{5.7}{5.32} = 107.1$ RPD = 0. $\frac{5.7}{5.32} = 107.1$ </p>			
VII. Laboratory Control Sample (LCS)			
1. Were LCS samples run?	<input checked="" type="radio"/> Yes	No	N/A
2. If performed, were LCS recoveries within the QC limits?	<input checked="" type="radio"/> Yes	No	N/A
3. If performed, were LCS calculations performed correctly, and did laboratory reported values match raw data?	Yes	No	<input checked="" type="radio"/> 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
<p>Comments/Qualifications:</p> <p> TJ IAC 6/23 var. 87-107 Nitrob. $\frac{2.76}{3.00} = 92\%$ 6/24 779.D 24 dist. $\frac{2.4}{2.5} = 96\%$ var. 88-112 </p>			
VIII. Field QC Samples			

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

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: PB047 Matrix/No. Samples: w-3

1. Were field blank or equipment rinsate samples associated with this SDG?	Yes	<input checked="" type="radio"/> No	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?	<input checked="" type="radio"/> Yes	No	N/A
4. Were RPDs field duplicate pairs within acceptable limits (+ or -20%)	<input checked="" type="radio"/> Yes	No	N/A
5. Were any qualifications required based on field QC information?	Yes	<input checked="" type="radio"/> No	N/A

Comments/Qualifications:

3003 - 3006
↳ U's ↵

IX. Compound Identification

1. Are relative retention times (RRTs) within acceptable RRT windows?	Yes	No	<input checked="" type="radio"/> N/A
2. Were identified compounds confirmed on second column?	Yes	No	N/A
3. Were any qualification required based on this information?	Yes	No	N/A

Comments/Qualifications:

~~3003 - 3006~~
↳ U's ↵

No raw data - level III

X. Overall Assessment of Data

1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	<input checked="" type="radio"/> No	N/A
Comments/Qualifications:			

STL / Accutest
 SDG: PB047 / F24891

Project: PLUM BROOK Ordnance Works

Method: TOTAL/DISSOLVED METALS
6010B
7470A

Matrix/No. of Samples: Water-3

Validation Samples: DG 3003
DG 3006
DG 3007

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>N/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:

- ⑪ - ~~12. Zinc had a high RPD in the~~ ^{TK}
- 10a • Contamination in the method blank resulted in a "u" qualifier for Tl in DG3003T, DG3006T and DG3006D; Zn from DG3003T, and DG3006T
- 13 • K and Na had a high LOD in the serial dilution and were qualified as "J" in DG3007

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified

Date: 9/10/2004

Validator's Signature

Thomas Kitching

Peer Reviewer:

SHAW E & I INC

Client Sample ID: DG3003

TOTAL Metals

Lot-Sample #...: H4F190139-001

Matrix.....: WATER

Date Sampled...: 06/17/04

Date Received...: 06/19/04

PARAMETER	RESULT	REPORTING LIMIT	UNITS ^{Rw} <i>Qual</i>	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...:	4173049					
Aluminum	84.8 B	200	ug/L J	SW846 6010B	06/21-06/23/04	GJMRM1AL
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 41.3	
Antimony	ND	60.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1AP
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1AT
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 2.6	
Barium	112 B	200	ug/L J	SW846 6010B	06/21-06/23/04	GJMRM1AW
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1A1
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1A4
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 0.84	
Calcium	194000	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1A7
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 58.2	
Chromium	ND	10.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1CA
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1CE
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 2.0	
Copper	ND	25.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1CH
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 3.0	
Iron	104	100	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1CL
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 45.8	
Lead	ND	3.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMRM1CP
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 1.6	
Magnesium	70400	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1CT
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 37.0	

(Continued on next page)

SHAW E & I INC

Client Sample ID: DG3003

TOTAL Metals

Lot-Sample #...: H4F190139-001

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Manganese	105	15.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1CW
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 1.6	
Nickel	ND	40.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1C1
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 2.8	
Potassium	10800 J	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1C4
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 66.8	
Selenium	1.5 B	5.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1C7
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 1.5	
Silver	ND	10.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1DA
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 1.9	
Sodium	67000	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1DE
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 464	
Thallium	5.2 B,J	10.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1DE
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1DL
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 3.6	
Zinc	5.1 B,J	20.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1DP
		Dilution Factor: 1		Analysis Time...: 14:11	MDL.....: 2.4	
Prep Batch #...: 4173063						
Mercury	ND	0.20	ug/L	SW846 7470A	06/21/04	GJMRM1DT
		Dilution Factor: 1		Analysis Time...: 16:02	MDL.....: 0.060	

NOTE(S):

B Estimated result. Result is less than RL.

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

SHAW E & I INC

Client Sample ID: DG3003

DISSOLVED Metals

Lot-Sample #...: H4F190139-001
Date Sampled...: 06/17/04

Date Received...: 06/19/04

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4173049						
Aluminum	ND	200	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1EW
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 41.3	
Antimony	ND	60.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1E1
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1E4
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 2.6	
Barium	117 B	200	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1E7
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1FA
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1FE
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 0.84	
Calcium	193000	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1FH
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 58.2	
Chromium	ND	10.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1FL
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1FP
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 2.0	
Copper	ND	25.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1FT
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 3.0	
Iron	ND	100	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1FW
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 45.8	
Lead	ND	3.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1F1
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 1.6	
Magnesium	70200	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1F4
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 37.0	

(Continued on next page)

SHAW E & I INC

Client Sample ID: DG3003

DISSOLVED Metals

Lot-Sample #...: H4F190139-001

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS ^{Rev} <i>Quel</i>	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Manganese	103	15.0	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1P7
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 1.6	
Nickel	ND	40.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMRM1GA
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 2.8	
Potassium	10900 J	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1GE
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 66.8	
Selenium	ND	5.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMRM1GH
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 1.5	
Silver	ND	10.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMRM1GL
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 1.9	
Sodium	67700	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMRM1GP
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 464	
Thallium	ND	10.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMRM1GT
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMRM1GW
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 3.6	
Zinc	ND	20.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMRM1G1
		Dilution Factor: 1		Analysis Time...: 13:58	MDL.....: 2.4	
Prep Batch #...: 4173063						
Mercury	0.060 B	0.20	ug/L <i>J</i>	SW846 7470A	06/21/04	GJMRM1G4
		Dilution Factor: 1		Analysis Time...: 15:56	MDL.....: 0.060	

NOTE(S):

B Estimated result. Result is less than RL.

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

SHAW E & I INC

Client Sample ID: DG3006

TOTAL Metals

Lot-Sample #...: H4F190139-003

Date Sampled...: 06/17/04

Date Received...: 06/19/04

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS <i>Rev</i> <i>Qual</i>	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4173049						
Aluminum	77.1 B	200	ug/L J	SW846 6010B	06/21-06/23/04	GJMR01AH
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 41.3	
Antimony	ND	60.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AJ
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AK
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 2.6	
Barium	111 B	200	ug/L J	SW846 6010B	06/21-06/23/04	GJMR01AL
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AA
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AC
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 0.84	
Calcium	192000	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMR01AD
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 58.2	
Chromium	ND	10.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AQ
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AR
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 2.0	
Copper	ND	25.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AT
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 3.0	
Iron	98.4 B	100	ug/L J	SW846 6010B	06/21-06/23/04	GJMR01AU
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 45.8	
Lead	ND	3.0	ug/L U	SW846 6010B	06/21-06/23/04	GJMR01AV
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 1.6	
Magnesium	69600	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMR01AW
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 37.0	

(Continued on next page)

SHAW E & I INC

Client Sample ID: DG3006

TOTAL Metals

Lot-Sample #...: H4F190139-003

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS ^{Rw}	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Manganese	104	15.0	ug/L	SW846 6010B	06/21-06/23/04	GJMR01AX
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 1.6	
Nickel	ND	40.0	ug/L ^u	SW846 6010B	06/21-06/23/04	GJMR01AM
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 2.8	
Potassium	10700 J	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMR01AN
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 66.8	
Selenium	ND	5.0	ug/L ^u	SW846 6010B	06/21-06/23/04	GJMR01AP
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 1.5	
Silver	ND	10.0	ug/L ^u	SW846 6010B	06/21-06/23/04	GJMR01A3
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 1.9	
Sodium	66300	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMR01A4
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 464	
Thallium	4.4 B,J	10.0	ug/L ^{B 6a}	SW846 6010B	06/21-06/23/04	GJMR01A5
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L ^u	SW846 6010B	06/21-06/23/04	GJMR01A6
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 3.6	
Zinc	3.6 B,J	20.0	ug/L ^{B 6a}	SW846 6010B	06/21-06/23/04	GJMR01A7
		Dilution Factor: 1		Analysis Time...: 14:30	MDL.....: 2.4	
Prep Batch #...: 4173063						
Mercury	ND	0.20	ug/L ^u	SW846 7470A	06/21/04	GJMR01A8
		Dilution Factor: 1		Analysis Time...: 16:09	MDL.....: 0.060	

NOTE(S):

B Estimated result. Result is less than RL.

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

SHAW B & I INC

Client Sample ID: DG3006

DISSOLVED Metals

Lot-Sample #...: H4F190139-003

Date Sampled...: 06/17/04

Date Received...: 06/19/04

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	REMARKS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 4173049							
Aluminum	ND	200	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CL
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 41.3	
Antimony	ND	60.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CA
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 4.0	
Arsenic	ND	10.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CC
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 2.6	
Barium	118 B	200	ug/L	J	SW846 6010B	06/21-06/23/04	GJMR01CD
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 0.96	
Beryllium	ND	5.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CQ
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 0.56	
Cadmium	ND	5.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CR
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 0.84	
Calcium	195000	5000	ug/L		SW846 6010B	06/21-06/23/04	GJMR01CT
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 58.2	
Chromium	ND	10.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CU
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 2.8	
Cobalt	ND	50.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CV
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 2.0	
Copper	ND	25.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CW
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 3.0	
Iron	ND	100	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CX
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 45.8	
Lead	ND	3.0	ug/L	u	SW846 6010B	06/21-06/23/04	GJMR01CM
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 1.6	
Magnesium	70900	5000	ug/L		SW846 6010B	06/21-06/23/04	GJMR01CN
		Dilution Factor: 1			Analysis Time...: 14:25	MDL.....: 37.0	

(Continued on next page)

SHAW E & I INC

Client Sample ID: DG3006

DISSOLVED Metals

Lot-Sample #...: H4F190139-003

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS ^{Rev} _{Qual}	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Manganese	104	15.0	ug/L	SW846 6010B	06/21-06/23/04	GJMR01CP
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 1.6	
Nickel	ND	40.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMR01C2
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 2.8	
Potassium	10900 J	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMR01C3
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 66.8	
Selenium	ND	5.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMR01C4
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 1.5	
Silver	ND	10.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMR01C5
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 1.9	
Sodium	68400	5000	ug/L	SW846 6010B	06/21-06/23/04	GJMR01C6
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 464	
Thallium	5.8 B,J	10.0	ug/L <i>u</i> <i>ba</i>	SW846 6010B	06/21-06/23/04	GJMR01C7
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 2.4	
Vanadium	ND	50.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMR01C8
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 3.6	
Zinc	ND	20.0	ug/L <i>u</i>	SW846 6010B	06/21-06/23/04	GJMR01C0
		Dilution Factor: 1		Analysis Time...: 14:25	MDL.....: 2.4	
Prep Batch #...: 4173063						
Mercury	ND	0.20	ug/L <i>u</i>	SW846 7470A	06/21/04	GJMR01C1
		Dilution Factor: 1		Analysis Time...: 16:07	MDL.....: 0.060	

NOTE(S) :

- B Estimated result. Result is less than RL.
- J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Report of Analysis

Client Sample ID: DG3007	Date Sampled: 06/17/04
Lab Sample ID: F24891-1	Date Received: 06/18/04
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: PBOW	

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	43.0 B	200	20	ug/l	J 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Antimony	3.5 U	5.0	3.5	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Arsenic	6.1 B	10	3.5	ug/l	J 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Barium	106 B	200	1.1	ug/l	J 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Beryllium	0.80 U	4.0	0.80	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Cadmium	0.30 U	5.0	0.30	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Calcium	194000	1000	42	ug/l	1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Chromium	2.4 U	10	2.4	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Cobalt	1.0 U	50	1.0	ug/l	1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Copper	1.4 U	25	1.4	ug/l	1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Iron	48 U	300	48	ug/l	1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Lead	2.9 U	5.0	2.9	ug/l	1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Magnesium	71700	5000	33	ug/l	1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Manganese	103	15	0.60	ug/l	1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Mercury	0.052 U	1.0	0.052	ug/l	u 1	06/28/04	06/29/04	SM SW846 7470A ¹	SW846 7470A ³
Nickel	0.80 U	40	0.80	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Potassium	13100	5000	51	ug/l	J 131	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Selenium ^a	18 U	40	18	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Silver	1.9 U	10	1.9	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Sodium	68300	5000	200	ug/l	J 131	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Thallium	2.9 U	10	2.9	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Vanadium	0.60 U	50	0.60	ug/l	u 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴
Zinc	8.8 B	20	5.1	ug/l	J 1	07/10/04	07/12/04	DM SW846 6010B ²	SW846 3010A ⁴

- (1) Instrument QC Batch: MA3864
(2) Instrument QC Batch: MA3883
(3) Prep QC Batch: MP6827
(4) Prep QC Batch: MP6876

(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:	DG3007	Date Sampled:	06/17/04
Lab Sample ID:	F24891-1A	Date Received:	06/18/04
Matrix:	AQ - Groundwater Filtered	Percent Solids:	n/a
Project:	PBOW		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Aluminum	69.5 B	200	20	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Antimony	5.0	5.0	3.5	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Arsenic	5.1 B	10	3.5	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Barium	116 B	200	1.1	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Beryllium	0.80 U	4.0	0.80	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Cadmium	0.30 U	5.0	0.30	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Calcium	197000	1000	42	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Chromium	2.4 U	10	2.4	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Cobalt	1.0 U	50	1.0	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Copper	1.4 U	25	1.4	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Iron ^a	480 U	1200	480	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Lead	2.9 U	5.0	2.9	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Magnesium	72300	5000	33	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Manganese	101	15	0.60	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Mercury	0.052 U	1.0	0.052	ug/l	1	06/28/04	06/29/04	SM	SW846 7470A ¹	SW846 7470A ³
Nickel	0.80 U	40	0.80	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Potassium	13100	5000	51	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Selenium ^a	18 U	40	18	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Silver	1.9 U	10	1.9	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Sodium	70200	5000	200	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Thallium	2.9 U	10	2.9	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Vanadium	0.60 U	50	0.60	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴
Zinc	5.1 U	20	5.1	ug/l	1	07/10/04	07/12/04	DM	SW846 6010B ²	SW846 3010A ⁴

- (1) Instrument QC Batch: MA3864
(2) Instrument QC Batch: MA3883
(3) Prep QC Batch: MP6827
(4) Prep QC Batch: MP6876

(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: 9/10

Project: Plum Brook SDG: PH047 / 1524891 Matrix/No. Samples: W-3

I. Sample Management			
A. Sample Preservation, Handling and Transport			
1. Have all samples been preserved with HNO ₃ to pH <2?	<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?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
Cooler @ 2.3° , 2.8°.			
B. Chain of Custody			
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
C. Holding Times			
1. Were samples 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?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A
SAMPLED		PREPPED/ANALYZED	
6/17	6/21 7/1	6/23 7/12	
II. Calibrations			
1. Were proper number of calibration standards used for each analytical instrument used?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
2. Is the calibration correlation coefficient >or = 0.995 for each analytical instrument used?	<input type="radio"/> Yes	<input type="radio"/> 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	<input type="radio"/> No	N/A
4. Are CRDL Standard %R within 10% (+ or - 1%) acceptance window?	<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	N/A
Comments/Qualifications: <u>ICP</u> H ₃ ICV 100 CCV 1,2 1033- CCV 3,4 1062- <u>ICV</u> CCV's. [all w/in 10%]			

**DATA VALIDATION WORKSHEET
METALS**

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: PB047/K24891 Matrix/No. Samples: W-3

III. Blanks

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

Comments/Qualifications: 6/21-23
 6/21-6/23 total Dissolv.
 3003
 3006 K @ 97.1 → 97.1
 37 TL @ 5.9 → 5.9
 67 ZU @ 7.0 → 7.0
 3007 Hg-KCB's /CCBs
 -u's.
 LCS all u's.
 Prep u's.

IV. ICP Interference Check Sample (ICS)

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

Comments/Qualifications:
 3007 Ni. $\frac{950}{1000} = 95\%$
 89.7 - 108.0 ✓

V. Blank Spike/Laboratory Control Sample (LCS)

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

Comments/Qualifications:
 HA ICR ff total.
 6/21-6/23
 Hg - 94
 98-108
 CR $\frac{204}{200} = 102\%$
 DISSOLV
 3007 93.6-111.0
 Pb $\frac{1030}{1000} = 103\%$

**DATA VALIDATION WORKSHEET
METALS**

Reviewer: Kitchings Date: 9/10

Project: Plum Brook SDG: PB041 / F81891 Matrix/No. Samples: w-3

IX. Sample Result Qualification
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

Comments/Qualifications: No raw data - level III

X. Field QC

1. Were any Field Duplicates associated with this SDG?	<input checked="" type="radio"/> Yes	No	N/A
a. If Yes, were RPDs acceptable (³⁰ 50% for water samples, ⁵⁰ 100% for soil samples)?	Yes	<input checked="" type="radio"/> 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

Comments/Qualifications: ORIG Total FN
3003 5.1 Zn 3.6
3003 3006
1.5 / 4.35 = 0.35
qualif. as "u" method 6/6
DISOLV 3006
all < 30%

XI. Overall Assessment of Data

1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	<input checked="" type="radio"/> No	N/A
---	-----	-------------------------------------	-----

Comments/Qualifications:

Attachment 2
Chain of Custody Forms

44F190139

REFERENCE COC NO.: P806 17 04STL-K

PAGE 1 OF 2

ANALYSIS REQUEST AND CHAIN-OF-CUSTODY RECORD

copy



Project Name/No.: P806
 Sample Team Member: David Kessler
 Profit Center: Knoxville
 Project Manager: Steve Downey
 Project No.: 843636
 Required Report Date: 21 DAYS

Sample Shipment Date: 6/17/04
 Laboratory Destination: STL - Knoxville
 Laboratory Contact: Jamie McKinney
 Project Contact/Phone: Maureen McMyler/865-690-3211
 Carrier Waybill No.: 839702939568

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
DG3003	WATER	6/17/04 0945	1 - HDPE	250 mL 125	Cool	Explosives by 8330 Total TAL Metals by 6010B/7470A Dissolved TAL Metals by 6010B/7470A TCL SVOCs by 8270C	CUSTOMER SEALS INTACT RECEIVED TEMP. 2.6 1 COOLER / FEDAX T# 839702939568	
DG3003-MS	WATER	6/17/04 0945	1 - HDPE	250 mL 125	HNO3	Explosives by 8330 Total TAL Metals by 6010B/7470A Dissolved TAL Metals by 6010B/7470A TCL SVOCs by 8270C	PH12	MADE 06-18-04
DG3003-MSD	WATER	6/17/04 0945	1 - HDPE	250 mL 125	HNO3	Explosives by 8330 Total TAL Metals by 6010B/7470A Dissolved TAL Metals by 6010B/7470A TCL SVOCs by 8270C	PH12	RECEIVED MISSING CONTAINERS ON 6-19-04 11:15 EXPORT FMS DG3006 9013 BOTTLE RECEIVED AT 2 P
DG5002	WATER	6/17/04	1 - HDPE	40 mL	HCL	Explosives by 8330 Total TAL Metals by 6010B/7470A Dissolved TAL Metals by 6010B/7470A TCL SVOCs by 8270C	PH12	CUSTOMER SEALS INTACT ON 6-19-04 1 COOLER / FEDAX 839702939568

Possible Hazard Identification:

Non-haz: Flammable: _____
 Turnaround Time: _____

Normal: Rush: _____

1. Relinquished by: David Kessler-Shaw

2. Relinquished by:

3. Relinquished by:

Comments:

Sample Disposal:

Return to Client: _____ Disposal by Lab: Archive: _____

Level of QC Required:

Unknown: _____

Definitive:

Date: 6/17/04
 Time: 1800

Project Specifics:

1. Received by: _____ Date: 6-18-04

Time: 09:15

2. Received by: _____ Date: 6-19-04

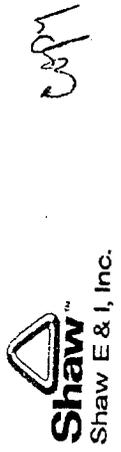
Time: 11:15

H4F17039

REFERENCE COC NO.: PB06 17 04STL-K

PAGE KZ OF 2

ANALYSIS REQUEST AND CHAIN-OF-CUSTODY RECORD



Project Name/No: PBOW
 Sample Team Member: David Kessler
 Profit Center: Knoxville
 Project Manager: Steve Downey
 Project No.: 841656
 Required Report Date: 21 DAYS

Sample Shipment Date: 6/17/04
 Laboratory Destination: STL-Knoxville
 Laboratory Contact: Jamie McKinney
 Project Contact/Phone: Maurice McMyler/865-690-3211
 Carrier Waybill No.: 837702739568

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
DG-3006	WATER	6/17/04 0945	1 - Amber 1 - HDPE 1 - HDPE 2 - Amber	1 L 200 mL 200 mL 125	Cool HNO3 HNO3 Cool	Explosives by 8330 Total TAL Metals by 6010B/7470A PHA Dissolved TAL Metals by 6010B/7470A TCL SVOCs by 8270C		
DG 3001	WATER	6/17/04	1 - Amber 1 - HDPE 1 - HDPE 2 - Amber	1 L 200 mL 200 mL 125	HCL NaOH Cool HNO3 HNO3 Cool	Cyanide by 90109012 Explosives by 8330 Total TAL Metals by 6010B/7470A PHA Dissolved TAL Metals by 6010B/7470A TCL SVOCs by 8270C		
DICK	WATER	1515	3 - Glass 1 - HDPE	40 mL 40 mL	HCL NaOH	TCL SVOCs by 8270C Cyanide by 90109012		
PICK								

10 L bottles for SVOC DG 3001

Special Instructions:

Possible Hazard Identification:

Non-haz: Flammable: _____
 Turnaround Time: _____

Level of QC Required: _____

Sample Disposal: _____
 Return to Client: _____
 Disposal by Lab: Archive: _____

Normal: Rush: _____

1. Relinquished by: David Kessler-Shaw
 Date: 6/17/04
 Time: 9:00

Definitive:
 Date: 6/17/04
 Time: 9:00

Project Specific:
 1. Received by: Andrew D. Jensen
 Date: 06-18-04
 Time: 09:15

2. Relinquished by: _____
 Date: _____
 Time: _____

2. Received by: _____
 Date: _____
 Time: _____

3. Relinquished by: _____
 Date: _____
 Time: _____

2. Received by: _____
 Date: _____
 Time: _____

Comments:

F24891: Chain of Custody Page 1 of 2

Sample Number	Sample Type/Description	Date/Time Collected	Container Type	Sample Volume	Pre-Activation	Requested Testing Program	Condition on Receipt	Disposal Record
DC3008	WATER	6/17/04 0845	1 - Amber	1 L	Cool	Explosives by 820C		
		6/17/04 0845	2 - Amber	1 L	Cool	Semivolatiles by 820C		
		6/17/04 0845	3 - Vial	40 mL	HCl	Volatiles by 820B		
		6/17/04 0845	1 - HDPE	200 mL	HNO3	TAL Metals (Total) by 6010B/747A		
D-5003	WATER	6/17/04 0845	1 - HDPE	500 mL	HNO3	TAL Metals (Total) by 6010B/747A		
		6/17/04 0845	2 - Vial	40 mL	HCl	Volatiles by 820B		

Project Name/No: POW
 Project Team Member: David Kessler
 Project Center: Knoxville
 Project Manager: Steve Downey
 Project No.: 84656
 Required Report Date: 11/03/04

Sample Shipment Date: 6/17/04
 Laboratory Dispatch Date: 6/17/04
 Laboratory Contact: Sue Bell
 Project Contact/Phone: Maureen McMyler/865-560-5271
 Carrier Waybill No.: 4270690952245

Bill To: Accounting
 Shaw E & I
 312 Director Drive
 Knoxville, TN 37923

Report To: Maureen McMyler
 Shaw E & I
 312 Director Drive
 Knoxville, TN 37923

SHAW E & I, INC.
 ANALYSIS REQUEST AND CHAIN-OF-CUSTODY RECORD
 REFERENCE COC NO. 8896 17
 PAGE 1 OF 1
 F24891

Attachment 3

Project Data

Volatiles

LOCATION_CODE		PB047	PB047	F24891
SAMPLE_NO		DG3003	DG3006	DG3007
SAMPLE_DATE		17-June-04	17-June-04	17-June-04
		REG	FD	FS
Parameter	Units Filtered	Result Qual	Result Qual	Result Qual
Acetone	ug/L N	4.9 JB	4.0 JB	50 U
Benzene	ug/L N	1 U	1 U	1 U
Bromodichloromethane	ug/L N	1 U	1 U	2 U
Bromoform	ug/L N	1 U	1 U	2 U
Bromomethane	ug/L N	2 U	2 U	2 U
Butanone, 2-	ug/L N	5 U	5 U	10 U
Carbon disulfide	ug/L N	1.9	1.9	2.0
Carbon tetrachloride	ug/L N	1 U	1 U	2 U
Chlorobenzene	ug/L N	1 U	1 U	2 U
Chloroethane	ug/L N	2 U	2 U	2 U
Chloroform	ug/L N	1 U	1 U	2 U
Chloromethane	ug/L N	2 U	2 U	2 U
Dibromochloromethane	ug/L N	1 U	1 U	2 U
Dichloroethane, 1,1-	ug/L N	1 U	1 U	2 U
Dichloroethane, 1,2-	ug/L N	1 U	1 U	2 U
Dichloroethene, 1,1-	ug/L N	1 U	1 U	2 U
Dichloroethene, 1,2-	ug/L N	1 U	1 U	2 U
Dichloroethene, cis-1,2-	ug/L N			2 U
Dichloroethene, trans-1,2-	ug/L N			2 U
Dichloropropane, 1,2-	ug/L N	1 U	1 U	2 U
Dichloropropene, cis-1,3-	ug/L N	1 U	1 U	2 U
Dichloropropene, trans-1,3-	ug/L N	1 U	1 U	2 U
Ethylbenzene	ug/L N	1 U	1 U	2 U
Hexanone, 2-	ug/L N	5 U	5 U	10 U
Methyl-2-pentanone, 4-	ug/L N	5 U	5 U	10 U
Methylene chloride	ug/L N	2 U	2 U	5 U
Styrene	ug/L N	1 U	1 U	2 U
Tetrachloroethane, 1,1,2,2-	ug/L N	1 U	1 U	2 U
Tetrachloroethene	ug/L N	1 U	1 U	2 U
Toluene	ug/L N	1 U	1 U	2 U
Trichloroethane, 1,1,1-	ug/L N	1 U	1 U	2 U
Trichloroethane, 1,1,2-	ug/L N	1 U	1 U	2 U
Trichloroethene	ug/L N	1 U	1 U	2 U
Vinyl chloride	ug/L N	1 U	1 U	1 U
Xylenes, total	ug/L N	1 U	1 U	6 U

Semivolatiles

LOCATION_CODE		PB047	PB047	F24891
SAMPLE_NO		DG3003	DG3006	DG3007
SAMPLE_DATE		17-June-04	17-June-04	17-June-04
Parameter	Units Filtered	REG Result Qual	FD Result Qual	FS Result Qual
3-Methylphenol and 4-Methylphenol	ug/L N			4.8 U
Acenaphthene	ug/L N	10 U	10 U	4.8 U
Acenaphthylene	ug/L N	10 U	10 U	4.8 U
Anthracene	ug/L N	10 U	10 U	4.8 U
Benzo(a)anthracene	ug/L N	10 U	10 U	4.8 U
Benzo(a)pyrene	ug/L N	10 U	10 U	4.8 U
Benzo(b)fluoranthene	ug/L N	10 U	10 U	4.8 U
Benzo(ghi)perylene	ug/L N	10 U	10 U	4.8 U
Benzo(k)fluoranthene	ug/L N	10 U	10 U	4.8 U
Benzoic acid	ug/L N			24 U
Benzyl alcohol	ug/L N			4.8 U
Bis(2-chloroethoxy)methane	ug/L N	10 U	10 U	4.8 U
Bis(2-chloroethyl)ether	ug/L N	10 U	10 U	4.8 U
Bis(2-chloroisopropyl)ether	ug/L N	10 U	10 U	4.8 U
Bis(2-ethylhexyl)phthalate	ug/L N	10 U	10 U	4.8 U
Bromophenyl phenyl ether, 4-	ug/L N	10 U	10 U	4.8 U
Butyl benzyl phthalate	ug/L N	10 U	10 U	4.8 U
Carbazole	ug/L N	10 U	10 U	4.8 U
Chloro-3-methylphenol, 4-	ug/L N	10 U	10 U	4.8 U
Chloroaniline, 4-	ug/L N	10 U	10 U	4.8 U
Chloronaphthalene, 2-	ug/L N	10 U	10 U	4.8 U
Chlorophenol, 2-	ug/L N	10 U	10 U	4.8 U
Chlorophenyl phenyl ether, 4-	ug/L N	10 U	10 U	4.8 U
Chrysene	ug/L N	10 U	10 U	4.8 U
Dibenz(a,h)anthracene	ug/L N	10 U	10 U	4.8 U
Dibenzofuran	ug/L N	10 U	10 U	4.8 U
Dichlorobenzene, 1,2-	ug/L N	10 U	10 U	4.8 U
Dichlorobenzene, 1,3-	ug/L N	10 U	10 U	4.8 U
Dichlorobenzene, 1,4-	ug/L N	10 U	10 U	4.8 U
Dichlorobenzidine, 3,3'-	ug/L N	50 U	50 U	9.5 U
Dichlorophenol, 2,4-	ug/L N	10 U	10 U	4.8 U
Diethyl phthalate	ug/L N	10 U	10 U	4.8 U
Dimethyl phthalate	ug/L N	10 U	10 U	4.8 U
Dimethylphenol, 2,4-	ug/L N	10 U	10 U	4.8 U
Di-n-butyl phthalate	ug/L N	10 U	10 U	4.8 U
Dinitro-2-methylphenol, 4,6-	ug/L N	50 U	50 U	9.5 U
Dinitrophenol, 2,4-	ug/L N	50 U	50 U	24 U
Dinitrotoluene, 2,4-	ug/L N	10 U	10 U	4.8 U
Dinitrotoluene, 2,6-	ug/L N	10 U	10 U	4.8 U
Di-n-octyl phthalate	ug/L N	10 U	10 U	4.8 U
Fluoranthene	ug/L N	10 U	10 U	4.8 U
Fluorene	ug/L N	10 U	10 U	4.8 U
Hexachlorobenzene	ug/L N	10 U	10 U	4.8 U
Hexachlorobutadiene	ug/L N	10 U	10 U	4.8 U
Hexachlorocyclopentadiene	ug/L N	50 U	50 U	4.8 U
Hexachloroethane	ug/L N	10 U	10 U	4.8 U
Indeno(1,2,3-cd)pyrene	ug/L N	10 U	10 U	4.8 U
Isophorone	ug/L N	10 U	10 U	4.8 U
Methylnaphthalene, 2-	ug/L N	10 U	10 U	4.8 U

Methylphenol, 2-	ug/L N	10 U	10 U	4.8 U
Methylphenol, 4-	ug/L N	10 U	10 U	
Naphthalene	ug/L N	10 U	10 U	4.8 U
Nitroaniline, 2-	ug/L N	50 U	50 U	4.8 U
Nitroaniline, 3-	ug/L N	50 U	50 U	4.8 U
Nitroaniline, 4-	ug/L N	50 U	50 U	4.8 U
Nitrobenzene	ug/L N	10 U	10 U	4.8 U
Nitrophenol, 2-	ug/L N	10 U	10 U	4.8 U
Nitrophenol, 4-	ug/L N	50 U	50 U	24 U
n-Nitroso-di-n-propylamine	ug/L N	10 U	10 U	4.8 U
n-Nitrosodiphenylamine	ug/L N	10 U	10 U	4.8 U
Pentachlorophenol	ug/L N	50 U	50 U	24 U
Phenanthrene	ug/L N	10 U	10 U	4.8 U
Phenol	ug/L N	10 U	10 U	4.8 U
Pyrene	ug/L N	10 U	10 U	4.8 U
Trichlorobenzene, 1,2,4-	ug/L N	10 U	10 U	4.8 U
Trichlorophenol, 2,4,5-	ug/L N	10 U	10 U	4.8 U
Trichlorophenol, 2,4,6-	ug/L N	10 U	10 U	4.8 U

Explosives

LOCATION_CODE	PB047	PB047	F24891
SAMPLE_NO	DG3003	DG3006	DG3007
SAMPLE_DATE	17-June-04	17-June-04	17-June-04

<u>Parameter</u>	<u>Units Filtered</u>	<u>REG</u> <u>Result Qual</u>	<u>FD</u> <u>Result Qual</u>	<u>FS</u> <u>Result Qual</u>
Amino-2,6-dinitrotoluene, 4-	ug/L N	0.2 U	0.2 U	0.2 U
Amino-4,6-dinitrotoluene, 2-	ug/L N	0.2 U	0.2 U	0.2 U
Dinitrobenzene, 1,3-	ug/L N	0.2 U	0.2 U	0.2 U
Dinitrotoluene, 2,4-	ug/L N	0.2 U	0.2 U	0.2 U
Dinitrotoluene, 2,6-	ug/L N	0.2 U	0.2 U	0.2 U
HMX	ug/L N	0.5 U	0.5 U	0.2 U
Nitrobenzene	ug/L N	0.2 U	0.2 U	0.2 U
Nitrotoluene, 2-	ug/L N	0.2 U	0.2 U	0.2 U
Nitrotoluene, 3-	ug/L N	0.2 U	0.2 U	0.2 U
Nitrotoluene, 4-	ug/L N	0.2 U	0.2 U	0.2 U
RDX	ug/L N	0.5 U	0.5 U	0.2 U
Tetryl	ug/L N	0.2 U	0.2 U	0.2 U
Trinitrobenzene, 1,3,5-	ug/L N	0.2 U	0.2 U	0.2 U
Trinitrotoluene, 2,4,6-	ug/L N	0.2 U	0.2 U	0.2 U

Metals

LOCATION_CODE	PB047	PB047	F24891
SAMPLE_NO	DG3003	DG3006	DG3007
SAMPLE_DATE	17-June-04	17-June-04	17-June-04
Parameter	REG	FD	FS
<u>Units Filtered</u>	<u>Result Qual</u>	<u>Result Qual</u>	<u>Result Qual</u>
Aluminum	84.8 B	77.1 B	43.0 B
Aluminum	200 U	200 U	69.5 B
Antimony	60 U	60 U	3.5 U
Antimony	60 U	60 U	5
Arsenic	10 U	10 U	6.1 B
Arsenic	10 U	10 U	5.1 B
Barium	112 B	111 B	106 B
Barium	117 B	118 B	116 B
Beryllium	5 U	5 U	0.8 U
Beryllium	5 U	5 U	0.8 U
Cadmium	5 U	5 U	0.3 U
Cadmium	5 U	5 U	0.3 U
Calcium	194000	192000	194000
Calcium	193000	195000	197000
Chromium	10 U	10 U	2.4 U
Chromium	10 U	10 U	2.4 U
Cobalt	50 U	50 U	1.0 U
Cobalt	50 U	50 U	1.0 U
Copper	25 U	25 U	1.4 U
Copper	25 U	25 U	1.4 U
Iron	104	98.4 B	48 U
Iron	100 U	100 U	480 U
Lead	10 U	10 U	2.9 U
Lead	10 U	9 U	2.9 U
Magnesium	70400	69600	71700
Magnesium	70200	70900	72300
Manganese	105	104	103
Manganese	103	104	101
Mercury	0.2 U	0.2 U	0.05 U
Mercury	0.06 B	0.2 U	0.05 U
Nickel	40 U	40 U	0.8 U
Nickel	40 U	40 U	0.8 U
Potassium	10800 J	10700	13100
Potassium	10900 J	10900	13100
Selenium	1.5 B	5 U	18 U
Selenium	5 U	5 U	18 U
Silver	10 U	10 U	1.9 U
Silver	10 U	10 U	1.9 U
Sodium	67000	66300	68300
Sodium	67700	68400	70200
Thallium	5.2 BJ	4.4 BJ	2.9 U
Thallium	10 U	5.8 BJ	2.9 U
Vanadium	50 U	50 U	0.6 U
Vanadium	50 U	50 U	0.6 U
Zinc	5.1 BJ	3.6 BJ	8.8 B
Zinc	20 U	20 U	5.1 U