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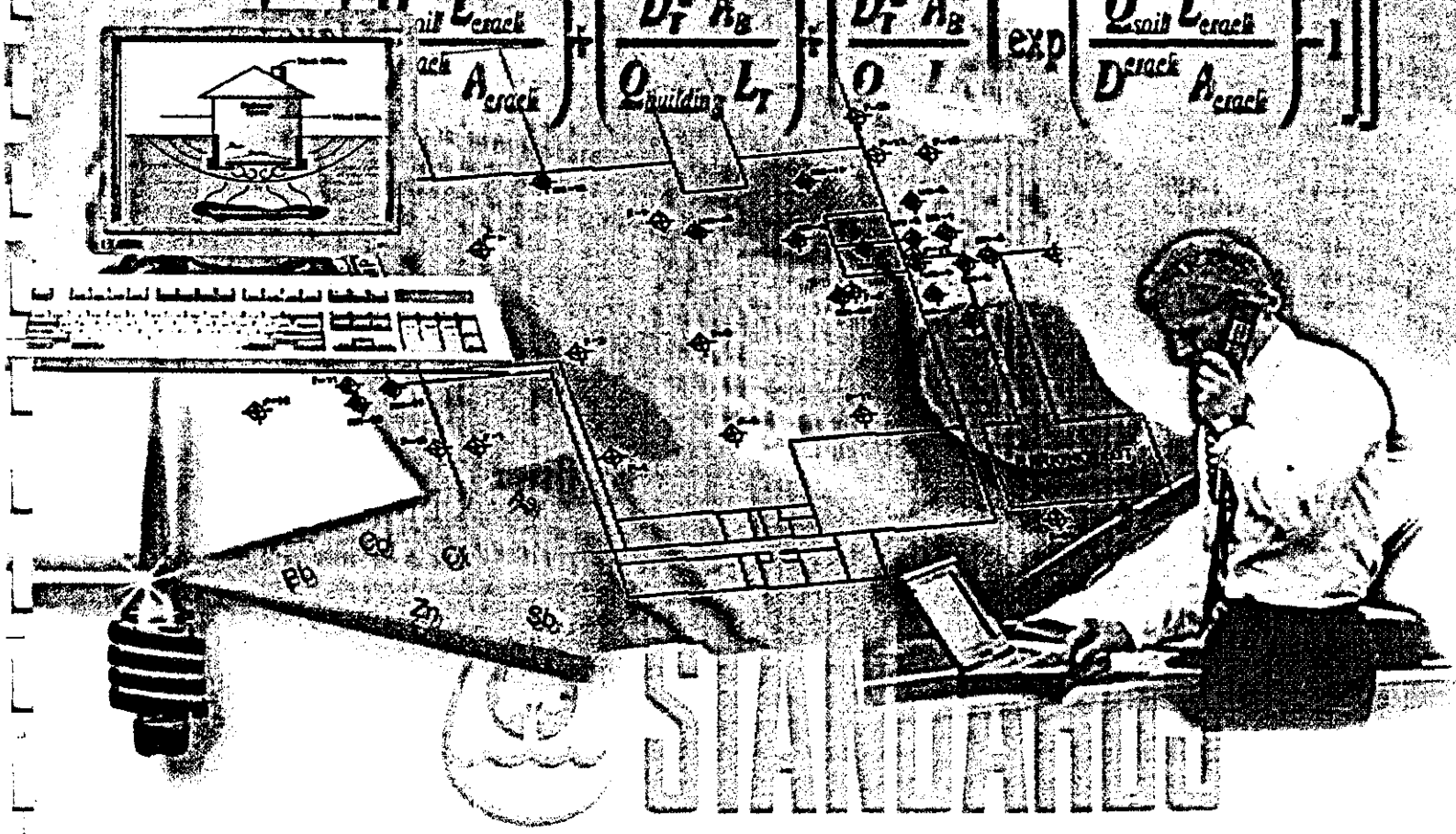
QUALITY ASSURANCE REVIEW OF POST-EXCAVATION SOIL SAMPLES COLLECTED ON JULY 2 AND 3, 2001 FOR PENN ENVIRONMENTAL AND REMEDIATION, INC.

November 19, 2001

$$\alpha = \frac{\left[\left(\frac{D_T^{eff} A_B}{Q_{building} L_T}\right) x \exp\left(\frac{Q_{soil} L_{crack}}{D^{crack} A_{crack}}\right)\right]}{\left[\left(\frac{Q_{soil} L_{crack}}{D^{crack} A_{crack}}\right) + \left(\frac{D_T^{eff} A_B}{Q_{building} L_T}\right) + \left(\frac{D_T^{eff} A_B}{Q_{building} L_T}\right)\left[\exp\left(\frac{Q_{soil} L_{crack}}{D^{crack} A_{crack}}\right) - 1\right]\right]}$$



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November 19, 2001

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Introduction

This quality assurance (QA) review is based upon a rigorous examination of the organic and inorganic data from the soil samples collected by Penn Environmental & Remediation, Inc. (Penn E&R) on July 2 and 3, 2001, from the Cinder/Slag Fill Area at the LPT Site. The samples included in this QA review are presented on Table 1. The laboratory was requested to prepare detailed data packages to substantiate the reported analytical results. The data packages that were prepared allowed for a fairly comprehensive review to be performed.

This review has been performed in accordance with the United States Environmental Protection Agency (US EPA) "Region III Modifications to the National Functional Guidelines for Organic Data Review Multi-media, Multi-Concentration (OLM01.0-OLM01.9)" (September 1994) and "Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses" (April 1993).

The reported analytical results are presented in Section 2. Data were examined to determine the usability of the analytical results and compliance relative to the analytical requirements specified by the "USEPA Contract Laboratory Program Statement of Work for Organic Analysis Multi-Media, Multi-Concentration OLM04.2" (CLP SOW OLM04.2, May 1999); "USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis Multi-Media, Multi-Concentration ILM04.0" with "Attachment 1 Statement of Work – Summary of Changes ILM04.1" (CLP SOW ILM04.1, January 2000); and the Sampling and Analysis Plan for the Cinder/Slag Fill Area Located on LPT's 2301 Renaissance Boulevard Property (Section 5.0) of the "Remedial Design/Remedial Action Work Plan for the Cinder/Slag Fill Area Located at 2301 Renaissance Boulevard in Upper Merion Township, Montgomery County, PA" (October 10, 2001). Qualifier codes have been placed next to the results to enable the data user to quickly assess the qualitative and/or quantitative reliability of any result. Details of this QA review are presented in Section 1 of this report. This report was prepared to provide a critical review of the laboratory analyses and reported analytical results. Rigorous QA reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most experienced and capable laboratories. The nature and extent of problems identified in this critical review should not be interpreted to mean that those results that do not have qualifier codes are less than valid.

TABLE 1

SAMPLES THAT HAVE UNDERGONE A RIGOROUS QUALITY ASSURANCE REVIEW

Penn E&R Sample Number	Laboratory Sample Number(s)	Sample Delivery Group	Matrix	Date of Collection	Parameter(s) Examined
SR-11	R2141-1	R2141	Soil	7/3/01	S, Pb
SR-11MS (Matrix Spike)	R2141-1S	R2141	Soil	7/3/01	Pb
SR-11DUP (Laboratory Duplicate)	R2141-1D	R2141	Soil	7/3/01	Pb
SR-12	R2141-2	R2141	Soil	7/3/01	S, Pb
SR-13	R2141-3	R2141	Soil	7/3/01	S, Pb
SR-14	R2141-4	R2141	Soil	7/3/01	S, Pb
SR-15	R2141-5	R2141	Soil	7/3/01	S, Pb
SR-15DL (Dilution Analysis)	R2141-5DL	R2141	Soil	7/3/01	S
SR-16	R2141-6	R2141	Soil	7/3/01	S, Pb
SR-16DL (Dilution Analysis)	R2141-6DL	R2141	Soil	7/3/01	S
SR-17	R2141-7	R2141	Soil	7/3/01	S, Pb
SR-18	R2141-8	R2141	Soil	7/3/01	S, Pb
SR-19	R2141-9	R2141	Soil	7/3/01	S, Pb
SR-20	R2141-10	R2141	Soil	7/3/01	S, Pb
SR-21	R2141-11	R2141	Soil	7/3/01	S, Pb
DUPLICATE2 (Field Duplicate of SR-20)	R2141-12	R2141	Soil	7/3/01	S, Pb
SR-9	R2141-13	R2141	Soil	7/2/01	S, Pb
SR-10	R2141-14	R2141	Soil	7/2/01	S, Pb

TABLE 1 (Cont.)

NOTES:

S	-	Project-Specific Semivolatile Organic Compounds (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Dibenzofuran, and Indeno(1,2,3-d)pyrene) by the CLP SOW OLM04.2.
Pb	-	Lead by the CLP SOW ILM04.1.

Section 1 Quality Assurance Review

A. Organic Data

The organic analyses of 16 soil samples (including secondary dilutions) were performed by CompuChem of Cary, North Carolina. Collectively, the samples were analyzed for project-specific semivolatile compounds by the CLP SOW OLM04.2. These analyses are specified on Table 1. The analytical results are summarized in Section 2 of this report.

The findings offered in this report are based on a review of the holding times, condition of samples upon laboratory receipt, blank analysis results, surrogate recoveries, field duplicate precision, gas chromatography/mass spectroscopy (GC/MS) system performance checks, calibrations, analytical sequence, internal standard areas, GPC calibration, target compound matching, the quantitation of positive results, and a critical evaluation of instrumental raw data.

A few deficiencies were identified as detailed below. The Environmental Standards data reviewer has edited the laboratory-reported data and QC summary forms based on the deficiencies and comments listed in this QA review. Furthermore, the Environmental Standards data reviewer has included copies of all relevant raw data, QC forms, and other documentation needed to support these edits in the Organic Data Support Documentation (Section 3) of this review. The following deficiencies and comments do not necessarily affect data usability. Usability is addressed in the subsequent Organic Data Qualifiers section.

Correctable Deficiency

- The laboratory did not include Sample Log-In Sheets (Forms DC-1) in the data package provided for the SDG included in this QA review. According to the CLP SOW OLM04.2 (B-56, Sect. 3.19.1), one original of Form DC-1 is required for each sample shipping container. The majority of the information to be reported on this form was reported on the Commercial Receiving Logs and SDG Narratives included in the data package provided; however, some of the information (*e.g.*, Custody Seal Numbers and presence or absence of Sample Tags) was not provided on these other forms. The data review process was not significantly impacted by the minor amount of missing information.

Noncorrectable Deficiency

- As stated in the SDG Narrative and on a hand-written note on the Chain-of-Custody records, samples SR-9 and SR-10 were not listed on the Chain-of-Custody records provided with the samples.

Comments

1. Samples SR-15 and SR-16 were reanalyzed for semivolatile compounds due to the presence of elevated levels of target compounds (greater than the calibration range of the instrument used for analysis) in the samples. The data reviewer evaluated the multiple sample results and reported only the "best result" (*i.e.,* least qualified or highest positive result or lowest quantitation limit) on Table 1 in Section 2. In order to make the determination of the "best results" of the multiple analyses, a data usability assessment of all reported sample results was required; therefore, the qualifiers presented in this QA review address the validation of all results reported by the laboratory. Dilution analyses are distinguished from original analyses with the "DL" suffix.

2. According to the SDG Narrative, samples SR-20 and SR-10 were analyzed at 12-fold and two-fold dilutions, respectively, due to results of the initial "sample screening" performed by the laboratory. In addition, sample DUPLICATE2 was analyzed at a five-fold dilution due to the viscosity of the sample extract. However, it should be noted that the GC/MS Semivolatile Run Logs provided with the raw data indicate that sample SR-20 was analyzed undiluted on 7/12/01 at 12:14. In addition, sample SR-10 was analyzed at a five-fold dilution on 7/12/01 at 17:58 and undiluted on 7/12/01 at 23:50. The raw data and results for the multiple analyses of samples SR-10 and SR-20 were not provided by the laboratory.

3. According to the SDG Narrative, sample SR-11 was used for the matrix spike/matrix spike duplicate analysis for the SDG. Due to a request from the client, the raw data and the results of the matrix spike/matrix spike duplicate analysis were not provided by the laboratory.

4. The samples submitted for analysis to the laboratory did not include field, equipment, or rinse blanks; consequently, the data reviewer could not evaluate possible sample contamination in the sampling procedures or in transit from the site to the laboratory.

With regard to data usability, the principal areas of concern are samples extracted outside of the technical holding times, positive results that exceeded the calibration range, imprecision between the results for the field duplicate pair, and quantitation below the contract-required quantitation limit (CRQL). Based upon a rigorous review of the data package provided, the following organic data qualifiers are offered. The following data usability issues represent an interpretation of the QC results obtained for the project samples. Quite often, data qualifications address issues relating to sample matrix problems. Similarly, the data validation guidelines routinely specify areas of the data that require qualification, yet the methods used for analysis may not require corrective action by the laboratory. Accordingly, the following data usability issues should <u>not</u> be construed as an indication of laboratory performance.

Organic Data Qualifiers

- All positive results in samples SR-9 and SR-10 should be considered estimated and have been flagged "J" on the data summary tables. The aforementioned samples were extracted 1 day outside of the Region III holding time of 7 days from collection to extraction. It should be noted that the samples were extracted within the CLP-required holding time of 10 days from verified time of sample receipt to extraction. It should also be noted that the target compounds are extremely persistent in the environment in non-aqueous matrices and would not be expected to degrade significantly during sample storage. Therefore, the positive results for the compounds in the aforementioned samples may be acceptable as reported.

- The positive results for benzo(b)fluoranthene in samples SR-15 and SR-16 and for benzo(a)anthracene in sample SR-15 should be considered estimated and have been flagged "J" on the qualified Form I's. The instrument levels for these compounds in the associated samples were greater than the highest initial calibration standard concentration. The laboratory subsequently diluted and reanalyzed the samples.

- One field duplicate pair (sample SR-20 and its field duplicate, sample DUPLICATE2) was included in this data set and analyzed for semivolatile organic compounds. Acceptable precision and sample representativeness were demonstrated by the correlation observed between the results in the field duplicate pair for all compounds with the exception of the results for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene in the field duplicate pair. The positive results for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene in samples SR-20 and DUPLICATE2 should be considered estimated and have been flagged "J" on the data summary tables. The criteria used to assess field duplicate precision were as follows: if both results were greater than five-times the CRQL, the relative percent difference must not exceed 40%; if one or both of the reported results was less than five-times the CRQL, the difference between the field duplicate results must not be greater than two-times the CRQL.

- Positive results reported below the CRQL but above the laboratory method detection limit (MDL) were qualified as estimated ("J") by the laboratory. The data reviewer agrees with the laboratory, has qualified these results as estimated, and has flagged the results "J" on the data summary tables and qualified Form I's.

A complete support documentation of this organic data QA review is presented in Section 3.

B. Inorganic Data

The inorganic analyses of 16 soil samples (including laboratory QC samples) were performed by CompuChem of Cary, North Carolina. All samples were analyzed for total lead by the CLP SOW ILM04.1. These analyses are specified on Table 1. The analytical results are summarized in Section 2 of this report.

The findings offered in this report are based on a review of the holding times, condition of samples upon laboratory receipt, blank analysis results, laboratory control sample (LCS) recoveries, matrix spike (MS) recoveries, laboratory duplicate precision, calibrations, contract-required detection limit (CRDL) standards, inductively coupled plasma (ICP) interference check sample results, analytical sequence, instrument detection limits (IDLs), ICP linear range, ICP serial dilution results, sample preparation, the quantitation of positive results, and a critical evaluation of instrumental raw data.

Two deficiencies were identified as detailed below. The Environmental Standards data reviewer has edited the laboratory-reported data and QC summary forms based on the deficiencies listed in this QA review. Furthermore, the Environmental Standards data reviewer has included copies of all relevant raw data, QC forms, and other documentation needed to support these edits in the Inorganic Data Support Documentation (Section 4) of this review. The following deficiencies and comments do not necessarily affect data usability. Usability is addressed in the subsequent Inorganic Data Qualifiers section.

Correctable Deficiencies

1. The laboratory provided instrument detection limit and ICP linear range summaries (Forms X and XII, respectively) in the data package that were dated 7/20/01; however, all project samples were analyzed on 7/19/01. The laboratory should have provided instrument detection limit and ICP linear range summaries dated prior to 7/19/01. It is the opinion of the data reviewer that the reported instrument detection limit and linear range for lead are most likely representative of the actual capabilities of the instrument used for analysis and that data quality was not affected by this issue.

2. The laboratory reported a result of "2.78" on the CRDL standard summary for the analysis for lead performed on 7/23/01 at 11:59 (the initial CRDL standard analysis). The raw data, however, indicate that this standard was actually an "LRS" standard and not a CRDL standard. The concentration of this standard was specified in the raw data as "3.0 ug/L"; therefore the recovery of lead in the standard was 92.7%. In any case, this standard should not have been reported on the CRDL standard summary.

Noncorrectable Deficiency

- As stated in the SDG Narrative and on a hand-written note on the Chain-of-Custody records, samples SR-9 and SR-10 were not listed on the Chain-of-Custody records provided with the samples.

Comments

1. The samples submitted for analysis to the laboratory did not include field, equipment, or rinse blanks; consequently, the data reviewer could not evaluate possible sample contamination in the sampling procedures or in transit from the site to the laboratory.

2. The laboratory performed a serial dilution analysis with the project samples on 7/19/01 but did not report the results of this analysis on the ICP Serial Dilutions summary (Form IX). Instead, the laboratory reanalyzed the serial dilution sample on 7/23/01 and reported the result of this analysis on the Form IX. The data reviewer could not determine why the serial dilution analysis required reanalysis. The results from the initial serial dilution analysis were entered onto the Form IX by the data reviewer. Data were not qualified due to this issue because the initial sample result was less than 50-times the IDL.

With regard to data usability, the principal area of concern is instrumental interference. Based upon a rigorous review of the data package provided, the following inorganic data qualifiers are offered. The following data usability issue represents an interpretation of the QC results obtained for the project samples. Quite often, data qualifications address issues relating to sample matrix problems. Similarly, the data validation guidelines routinely specify areas of the data that require qualification, yet the methods used for analysis may not require corrective action by the laboratory. Accordingly, the following data usability issue should not be construed as an indication of laboratory performance.

Inorganic Data Qualifiers

- The reported positive result for lead in sample SR-12 should be considered biased low estimated and has been flagged "L" on the data summary tables. Lead was observed to be present in the ICP interference check sample ICSA solution at a negative concentration with an absolute value greater than two-times the IDL, indicating a possible negative interference in the presence of high levels of interferents. High levels of ICP interferent (instrument level of interferent > 50% of the true value of the ICSA solution) were observed in the sample. Furthermore, the reported positive result for lead in the sample may be

significantly impacted by the negative ICP interference (instrument level of sample ≤ 5× the absolute value of the observed concentration in the ICSA solution).

- One field duplicate pair (sample SR-20 and its field duplicate, sample DUPLICATE2) was included in this data set and was analyzed for lead. Acceptable precision was demonstrated by the field duplicate pair. The criteria used to assess field duplicate precision were as follows: if both results were greater than five-times the CRDL, the relative percent difference must not exceed 40%; if one or both of the reported results was less than five-times the CRDL, the difference between the field duplicate results must not be greater than two-times the CRDL.

A complete support documentation of this inorganic data QA review is presented in Section 4.

C. Conclusions

Based on this QA review, a small portion of the organic data was qualified due to samples extracted outside of the technical holding time, positive results that exceeded the instrument calibration range, and quantitation below the contract-required quantitation limit (CRQL). In the inorganics analysis, one sample result was qualified due to instrumental interferences. In order to use any of the data, the data user should understand the limitations as specified in this QA review. The SDG Narratives and Project Chain-of-Custody Records are presented in Section 5 of this QA review.

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SECTION 2

ANALYTICAL RESULTS

Organic Data Qualifiers

U	The compound was analyzed for, but was not detected above the level of the associated value. The associated value is the sample quantitation limit.
B	The compound was not detected substantially above the level reported in a field, equipment, trip, and/or laboratory blank.
R	The result is unreliable. (Note: The compound may or may not be present.)
N	The compound should be considered present but a tentative identification.
J	The compound is present. The reported value may not be accurate or precise.
K	The compound is present. The reported value may be biased high. The actual value is expected to be lower than reported.
L	The compound is present. The reported value may be biased low. The actual value is expected to be higher than reported.
UJ	This compound was analyzed for, but was not detected. The associated quantitation limit may be inaccurate or imprecise.
UL	The compound was not detected, and the quantitation limit is probably higher than reported.
NJ	The qualitative identification of the compound is questionable due to poor resolution. The compound is presumptively present at approximately the reported value.

Inorganic Data Qualifiers

U	The analyte was analyzed for, but was not detected above the level of the associated value. The associated value is the sample detection limit.
B	The analyte was not detected substantially above the level reported in a field, equipment, and/or laboratory blank.
R	The result is unreliable. (Note: The analyte may or may not be present.)
J	The analyte is present. The reported value may not be accurate or precise.
K	The analyte is present. The reported value may be biased high. The actual value is expected to be lower than reported.
L	The analyte is present. The reported value may be biased low. The actual value is expected to be higher than reported.
UJ	This analyte was analyzed for, but was not detected. The associated detection limit may be inaccurate or imprecise.
UL	The analyte was not detected, and the detection limit is probably higher than reported.

TABLE 1

SUMMARY OF ANALYTICAL RESULTS FOR POST-EXCAVATION SOIL SAMPLES COLLECTED FROM EXCAVATION NO. 2 LOCATED AT THE SOUTHEAST END OF BASIN NO. 1 ON LPT'S 2301 RENAISSANCE BOULEVARD PROPERTY

ANALYTICAL PARAMETERS	SAMPLE DESIGNATION/ANALYTICAL RESULTS [1,2]	
	SR-9	SR-10
Benzo(a)anthracene	0.76J	1.9J
Benzo(b)fluoranthene	1.7J	2.2J
Benzo(a)pyrene	1.1J	1.9J
Indeno(1,2,3-cd)pyrene	0.94J	1.5J
Dibenzo(a,h)anthracene	0.26J	0.42J
Dibenzofuran	0.042J	0.13J
Lead	16.6	40.8
Sample Collection Depth:[3]	3.0 (SW)	4.0 (BS)

Notes

(1) - Each sample was analyzed by CompuChem, a USEPA-approved laboratory for benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, dibenzofuran, and lead

(2) - All results are in milligrams per kilogram

(3) - Sample collection depths are in feet below the ground surface

SW - Sidewall sample

BS - Bottom sample

ANALYTICAL PARAMETERS	SAMPLE DESIGNATION/ANALYTICAL RESULTS[1]											
	SR-11	SR-12	SR-13	SR-14	SR-15DL	SR-16DL	SR-17	SR-18	SR-19	SR-20	DUPLICATE 2	SR-21
Benzo(a)anthracene	<0.36	0.17J	0.070J	1.1	2.9	2.9	0.86	<0.38	0.66	11J	5.4J	0.94
Benzo(b)fluoranthene	0.038J	0.20J	0.21J	1.7	2.0	3.0	1.4	0.045J	1.1	14J	7.9J	3.1
Benzo(a)pyrene	0.041J	0.19J	0.17	1.3	2.1	2.7	1.1	<0.38	1.0	11J	5.8J	2.0
Indeno(1,2,3-cd)pyrene	<0.36	0.13J	0.14	0.79	1.2J	1.9	0.71	<0.38	0.82	7.8	4.4	1.9
Dibenzo(a,h)anthracene	<0.36	<0.39	<0.38	0.25J	0.39J	0.51J	0.23J	<0.38	0.26J	2.2J	1.3J	0.62
Dibenzofuran	<0.36	<0.39	<0.38	0.037J	0.29J	0.63J	0.098J	<0.38	<0.38	1.2J	0.28J	<0.38
Lead	9.7	4.1J	8.0	11.5	10.4	13.7	21.4	10.5	104	38.4	33.9	47.6
Sample Collection Depth[2]:	4.0 (BS)	3.5 (SWS)	4.5 (BS)	5.3 (BS)	5.8 (BS)	6.0 (BS)	6.0 (BS)	5.0 (BS)	3.9 (SWS)	3.0 (SWS)	3.0 (SWS)	4.5 (SWS)

Notes

(1) - Each sample was analyzed by CompuChem, a USEPA-approved laboratory for benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, dibenzofuran, and lead

(2) - Sample collection depths are in feet below the ground surface

DL - This sample was reanalyzed for semivolatile compounds at a higher dilution factor

< - This compound was not detected above the listed method reporting limit

ROD - Record of Decision

PADEP - Pennsylvania Department of Environmental Protection

USEPA - United States Environmental Protection Agency

BS - Bottom sample

SWS - Side wall sample

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SR-15

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Matrix: (soil/water) SOIL Lab Sample ID: R2141-5

Sample wt/vol: 30.0(g/mL) G Lab File ID: R2141-5C66

Level: (low/med) LOW Date Received: 07/06/01

% Moisture: 10 decanted: (Y/N) N Date Extracted: 07/10/01

Concentrated Extract Volume: 500(uL) Date Analyzed: 07/12/01

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.4 Extraction: (Type) SONC

CAS NO.	COMPOUND	Est. Qual.	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
132-64-9	Dibenzofuran	J	290	J
56-55-3	Benzo(a)anthracene	J	3300	E
205-99-2	Benzo(b)fluoranthene	J	3300	E
50-32-8	Benzo(a)pyrene		2500	
193-39-5	Indeno(1,2,3-cd)pyrene		1000	
53-70-3	Dibenzo(a,h)anthracene		410	

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE-NO.

SR-16

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Matrix: (soil/water) SOIL Lab Sample ID: R2141-6

Sample wt/vol: 30.0(g/mL) G Lab File ID: R2141-6C66

Level: (low/med) LOW Date Received: 07/06/01

% Moisture: 7 decanted: (Y/N) N Date Extracted: 07/10/01

Concentrated Extract Volume: 500(uL) Date Analyzed: 07/12/01

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.6 Extraction: (Type) SONC

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

CAS NO.	COMPOUND	EST Qual		Q
132-64-9	Dibenzofuran		520	
56-55-3	Benzo(a)anthracene		2700	
205-99-2	Benzo(b)fluoranthene	J	3600	E
50-32-8	Benzo(a)pyrene		2600	
193-39-5	Indeno(1,2,3-cd)pyrene		1300	
53-70-3	Dibenzo(a,h)anthracene		440	

SECTION 3

ORGANIC DATA SUPPORT DOCUMENTATION

Organic Analyses Support Documentation

Environmental Standards Project Name: Penn EZR/LPT DV
Sample Collection Dates: 7/2 and 7/3/01
Job Number: N101698.A000
Project Manager: DJL
Laboratory: CompuChem

Reviewed By: D. Lancaster
Approved By: MAM
Completion Date: 11/18/01

Applicable Sample No's.: ☒ Refer to Table 1 in the Quality Assurance Review

Sample No.	Lab. Control No.
See Table 1	

Deliverables:
- CLP ☑
- Tier I ☐
- Tier II ☐
- Limited ☐
- Other

The following table indicates criteria which were examined, the identified problems, and support documentation attachments.

SDG R2141

	Criteria Examined in Detail (Check (✓) If Yes or Footnote Letter for Comments Below)				Problems Identified (Check (✓) If Yes or Footnote Number for Comments Below)				Support Documentation Attachments (Check (✓) If Yes -- or Identify Attachment No.)			
	VOA Method	BNA Method CLP	PEST / PCB Method	Other Method(s)	VOA Method	BNA Method CLP	PEST / PCB Method	Other Method(s)	VOA Method	BNA Method CLP	PEST / PCB Method	Other Method(s)
Holding Times		✓				✓				✓		
Blank Analysis Results: Target Compounds		✓								✓		
Blank Analysis Results: TICs												
System Mntr. Cmpds. &/or Surrogate Spike Rslts.		✓								✓		
Matrix Spike / Matrix Spike Duplicate Results												
Blank Spike Results												
Duplicate Analysis Results ☑ Field ☐ Lab		✓								✓		
Qualitative Identification: Target Compounds		✓								✓		
Qualitative Identification: TICs												
DFTPP & BFB Mass Tuning		✓								✓		
GC Instrument Performance												
Initial Calibrations		✓								✓		
Continuing Calibrations		✓								✓		
Quantitation of Results		✓								✓		
DDT / Endrin Breakdown												
Surrogate Retention Time Shifts												
Internal Standards Performance		✓								✓		
Resolution Check Standards												
Analytical Sequence												
Florisil Cartridge Check & GPC Calibration												
GC Column Agreement												
Others:												

Comments: Six select pah compounds by CLP protocols - no TICs

BLANK ANALYSIS RESULTS FOR TARGET ORGANIC COMPOUNDS

SDG R2141

Fraction (1)	Matrix (Aq., S)	Blank Type (2)	Blank Sample Number	Contaminant	Concentration (units)	Qualification Limit 5x	Qualification Limit 10x
S	S	MB	SBLK40	none detected			

1 - V = Volatile; S = Semivolatile; P = Pesticide/PCB; O = Other: _____

Aq. = Aqueous; S = Solid

2 - MB = Method Blank; TB = Trip Blank; EB = Equipment Rinse Blank; FB = Field Blank
IB = Instrument Blank; SB = Storage Blank

* = Inferred from instrument printouts and/or supporting data; mass spectra not provided.

+ = Contaminant observed on one column only.

Notes: _____

EVALUATION OF REANALYSIS PRECISION

PRECISION OBJECTIVES		Compound > or = 5 X PRQL	Compound < 5 X PRQL
All Parameters	Aqueous	RPD < or = 20%	Difference < or = PRQL
	Solid	RPD < or = 40%	Difference < or = 2 X PRQL
	Air	RPD < or = 20%	Difference < or = PRQL

Sample Identification #1: SR-20 Units (enter one): ug/L, mg/l, ug/kg, mg/kg or ug/

Sample Identification #2: DUPLICATE2 UNITS: ug/kg

COMPOUND	SAMPLE ANALYTE CONCENTRATION	Q	DUPLICATE SAMPLE ANALYTE CONCENTRATION	Q	RELATIVE PERCENT DIFFERENCE (RPD)	PRQL	NOTES
benzo(a)anthracene	11000.00		5400.00		68	4400.00	2 ~~IN~~
benzo(b)fluoranthene	14000.00		7900.00		56	4400.00	2 ~~IN~~
benzo(a)pyrene	11000.00		5800.00		62	4400.00	2 ~~IN~~
indeno(1,2,3-cd)pyrene	7800.00		4400.00		56	4400.00	IN
dibenzo(a,h)anthracene	2200.00	J	1300.00	J	51	4400.00	IN
dibenzofuran	1200.00	J	280.00	J	124	4400.00	IN

NOTES:

1) Both results are > or = 5 X PRQL and RSD is over the acceptance limit, flag the positive results "J".

2) At least one of the result is < 5 X PRQL and the difference is over the acceptance limit, flag the positive results "J" and the "not-detected" results "UJ"

Q) The column in which the qualifier is entered to indicate if the analyte was not-detected or qualitatively questionable in the sample.

U) The compound was not-detected in the sample. One-half of the numerical value will be used for comparison purposes.

N.C.) The RPD was not calculated because one of the results was not-detected.

U*/B) The result was blank qualified. The numerical value will be used for comparison purposes.

Comments:

2D
SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Level:(low/med) LOW

	EPA SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	S7 (2CP) #	S8 (DCB) #	TOT OUT
01	SBLKUO	61	60	77	58	58	73	69	55	0
02	SR-11	49	45	63	44	41	56	51	40	0
03	SR-12	72	65	84	62	51	49	61	45	0
04	SR-13	69	70	49	57	58	72	66	50	0
05	SR-14	60	61	69	68	68	78	80	53	0
06	SR-15	57	59	77	57	59	76	64	47	0
07	SR-16	64	59	73	65	64	74	73	44	0
08	SR-17	46	45	67	58	54	68	59	39	0
09	SR-18	55	52	75	63	61	77	68	46	0
10	SR-19	53	50	60	62	56	69	64	44	0
11	SR-15DL	57	55	62	61	57	65	63	43	0
12	SR-16DL	74	65	79	71	71	74	75	59	0
13	SR-20	73	63	74	64	63	74	73	62	0
14	DUPLICATE2	73	58	62	61	60	66	71	52	0
15	SR-21	44	43	61	51	47	53	51	30	0
16	SR-9	50	46	67	55	51	57	58	38	0
17	SR-10	47	43	46	47	41	53	50	32	0
18										
19										
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23										
24										
25										
26										
27										
28										
29										
30										

		QC LIMITS	
S1 (NBZ)	= Nitrobenzene-d5	(23-120)	
S2 (FBP)	= 2-Fluorobiphenyl	(30-115)	
S3 (TPH)	= Terphenyl-d14	(18-137)	
S4 (PHL)	= Phenol-d5	(24-113)	
S5 (2FP)	= 2-Fluorophenol	(25-121)	
S6 (TBP)	= 2,4,6-Tribromophenol	(19-122)	
S7 (2CP)	= 2-Chlorophenol-d4	(20-130)	(advisory)
S8 (DCB)	= 1,2-Dichlorobenzene-d4	(20-130)	(advisory)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

62

4B
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE N

SBLKUO

Lab Name: COMPUCHEM | Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: | SAS No.: | SDG No.: R21

Lab File ID: WG11422-1C66_LPT | Lab Sample ID: WG11422-1

Instrument ID: 5972HP66 | Date Extracted: 07/10/01

Matrix: (soil/water) SOIL | Date Analyzed: 07/12/01

Level:(low/med) LOW | Time Analyzed: 0139

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

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	Date Collected
01	SR-11	R2141-1	R2141-1C66	07/12/01	7/3
02	SR-12	R2141-2	R2141-2C66	07/12/01	
03	SR-13	R2141-3	R2141-3C66	07/12/01	
04	SR-14	R2141-4	R2141-4C66	07/12/01	
05	SR-15	R2141-5	R2141-5C66	07/12/01	
06	SR-16	R2141-6	R2141-6C66	07/12/01	
07	SR-17	R2141-7	R2141-7C66	07/12/01	
08	SR-18	R2141-8	R2141-8C66	07/12/01	
09	SR-19	R2141-9	R2141-9C66	07/12/01	
10	SR-15DL	R2141-5	R2141-5DA66	07/12/01	
11	SR-16DL	R2141-6	R2141-6DA66	07/12/01	
12	SR-20	R2141-10	R2141-10DA66	07/12/01	
13	DUPLICATE2	R2141-12	R2141-12DA66	07/12/01	
14	SR-21	R2141-11	R2141-11JA66	07/12/01	
15	SR-9	R2141-13	R2141-13JA66	07/12/01	7/2 *
16	SR-10	R2141-14	R2141-14D2A6	07/13/01	*
17					
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30					

* Holding times not met per Functional Guidelines. one day outside 7 days from collection to extraction

COMMENTS:

page 1 of 1

FORM IV SV OLM04.2

6

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

SBLKUO

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R214

Matrix: (soil/water) SOIL Lab Sample ID: WG11422-1

Sample wt/vol: 30.0(g/mL) G Lab File ID: WG11422-1C66_I

Level: (low/med) LOW Date Received: _____

% Moisture: 0 decanted: (Y/N) N Date Extracted: 07/10/01

Concentrated Extract Volume: 500(uL) Date Analyzed: 07/12/01

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: ____ Extraction: (Type) SONC

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
132-64-9	Dibenzofuran	330	U
56-55-3	Benzo(a)anthracene	330	U
205-99-2	Benzo(b)fluoranthene	330	U
50-32-8	Benzo(a)pyrene	330	U
193-39-5	Indeno(1,2,3-cd)pyrene	330	U
53-70-3	Dibenzo(a,h)anthracene	330	U

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Lab File ID: DF010531A66 DFTPP Injection Date: 05/31/01

Instrument ID: 5972HP66 DFTPP Injection Time: 1047

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	57.2
68	Less than 2.0% of mass 69	0.0 (0.0)
69	Mass 69 relative abundance	68.0
70	Less than 2.0% of mass 69	0.0 (0.0)
127	25.0 - 75.0% of mass 198	47.7
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.4
275	10.0 - 30.0% of mass 198	21.8
365	Greater than 0.75% of mass 198	2.09
441	Present, but less than mass 443	11.8
442	40.0 - 110.0% of mass 198	72.5
443	15.0 - 24.0% of mass 442	13.2 (18.3)

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050X5	SSTD050X5	HG010531A66	05/31/01	1107
02	SSTD160X5	SSTD160X5	HH010531A66	05/31/01	1153
03	SSTD020X5	SSTD020X5	HI010531A66	05/31/01	1230
04	SSTD120X5	SSTD120X5	HJ010531A66	05/31/01	1307
05	SSTD080X5	SSTD080X5	HK010531A66	05/31/01	1345
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6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Instrument ID: 5972HP66 Calibration Date(s): 05/31/01 05/31/01

Calibration Times: 1107 1345

LAB FILE ID: RRF20 = HI010531A66 RRF50 = HG010531A66
RRF80 = HK010531A66 RRF120= HJ010531A66 RRF160= HH010531A66

COMPOUND		12:30 RRF20	11:07 RRF50	13:45 RRF80	13:07 RRF120	11:53 RRF160	RRF	% RS
Dibenzofuran	*	1.534	1.660	1.664	1.658	1.655	1.634	3
Benzo(a)anthracene	*	1.213	1.242	1.297	1.350	1.333	1.287	4
Benzo(b)fluoranthene	*	1.492	1.491	1.603	1.676	1.833	1.619	8
Benzo(a)pyrene	*	1.303	1.338	1.361	1.415	1.461	1.376	4
Indeno(1,2,3-cd)pyrene	*	1.334	1.298	1.348	1.392	1.454	1.365	4
Dibenzo(a,h)anthracene	*	1.297	1.254	1.291	1.309	1.366	1.303	3
Nitrobenzene-d5	*	0.484	0.452	0.480	0.473	0.472	0.472	2
2-Fluorobiphenyl	*	1.262	1.275	1.281	1.322	1.274	1.283	1
Terphenyl-d14	*	0.959	0.940	0.954	1.099	1.031	0.997	6
Phenol-d5	*	1.638	1.646	1.676	1.680	1.666	1.661	1
2-Fluorophenol	*	1.254	1.257	1.261	1.249	1.274	1.259	0
2,4,6-Tribromophenol		0.171	0.176	0.186	0.176	0.196	0.181	5
2-Chlorophenol-d4	*	1.212	1.215	1.245	1.219	1.225	1.223	1
1,2-Dichlorobenzene-d4	*	0.872	0.889	0.905	0.901	0.890	0.891	1

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

COMPUCHEM a division of Liberty Analytical Corp DATE 5/31/01 INITIAL TIME OF TUNE 1047 SHIFT/S(A) ✓ (B) ____ (C) ____

GC/MS SEMIVOLATILE RUN LOG TIME TUNE EXPIRES 2247 LINKER /METHOD OLM04 / ~~NY4~~ Fu 5/31/01

COMPUCHEM .LOGBOOK 4 X(4) 2 (5972hp66)

PREVENTIVE MAINTENANCE Liner/Septa/Seal Installed new ZB-5MS 30M 0.25mm column FN 5/30/01

	FILE NAME	DATE	TIME	CLIENT ID#	CASE/SDG#	AMOUNT INJECTED	CHEMIST	COMMENTS(ETC.)/DISPOSITION
1	DF010531A66	5/31/01	1047	DFTPP	—	2uL	917	SCD=LCD
2	HG010531A66	/ /	1107	SSTD050X5	—			#51676
3	HH010531A66	/ /	1153	SSTD160X5	—			#51679
4	HI010531A66	/ /	1230	SSTD020X5	—			#51675
5	HJ010531A66	/ /	1307	SSTD120X5	—			#51678
6	HK010531A66	/ /	1345	SSTD080X5	—			#51677
7	IDL#1 A66	/ /	1708	IDL#1	NY-IDL's		2319	
8	IDL#2 A66	/ /	1746	IDL#2				
9	IDL#3 A66	/ /	1823	IDL#3				
10	IDL#4 A66	/ /	1900	IDL#4				
11	IDL#5 A66	/ /	1937	IDL#5				
12		/ /			FN 5-31-01 MP GOOD!			
13		/ /						
14		/ /						
15		/ /						
16		/ /						
17		/ /						
18		/ /						
19		/ /						
20		/ /						
21		/ /						
22		/ /						
23		/ /						
24		/ /						

FN 5-31-01

STANDARDS

	Tune	Analytical	Int. Std.	Column Type
Std. ID #	7055	SEE COMMENTS	800	ZB-5MS 0.25mm
Lot #	51435	↓	51477	

SUPERVISOR APPROVAL [signature]

DATE 5-31-01

The presence of the Chemist's employee ID number, or signature, on this run log attests that strict compliance with the method's SOP ha occurred. Any SOP deviations require documentation by the responsible chemist together with the chemist's initials and the initials of th lab supervisor and a QA department representative, signifying approval of the deviation.

2/2/01:mlj

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Lab File ID: DF010712C66 DFTPP Injection Date: 07/12/01

Instrument ID: 5972HP66 DFTPP Injection Time: 0045

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	52.7
68	Less than 2.0% of mass 69	0.0 (0.0)
69	Mass 69 relative abundance	60.8
70	Less than 2.0% of mass 69	0.0 (0.0)
127	25.0 - 75.0% of mass 198	44.3
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.2
275	10.0 - 30.0% of mass 198	23.4
365	Greater than 0.75% of mass 198	2.31
441	Present, but less than mass 443	12.7
442	40.0 - 110.0% of mass 198	77.7
443	15.0 - 24.0% of mass 442	15.0 (19.3)

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARD

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050GD	SSTD050GD	HG010712C66	07/12/01	0104
02	SBLKUO	WG11422-1	WG11422-1C66 L	07/12/01	0139
03	SR-11	R2141-1	R2141-1C66	07/12/01	0546
04	SR-12	R2141-2	R2141-2C66	07/12/01	0731
05	SR-13	R2141-3	R2141-3C66	07/12/01	0807
06	SR-14	R2141-4	R2141-4C66	07/12/01	0842
07	SR-15	R2141-5	R2141-5C66	07/12/01	0917
08	SR-16	R2141-6	R2141-6C66	07/12/01	0953
09	SR-17	R2141-7	R2141-7C66	07/12/01	1028
10	SR-18	R2141-8	R2141-8C66	07/12/01	1103
11	SR-19	R2141-9	R2141-9C66	07/12/01	1139
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Instrument ID: 5972HP66 Calibration Date: 07/12/01 Time: 0104

Lab File ID: HG010712C66 Init. Calib. Date(s): 05/31/01 05/31/0

EPA Sample No.(SSTD050##): SSTD050GD Init. Calib. Times: 1107 1345

GC Column: ZB-5MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Dibenzofuran	1.634	1.820	0.800	11.4	25.0
Benzo(a)anthracene	1.287	1.219	0.800	-5.3	25.0
Benzo(b)fluoranthene	1.619	1.544	0.700	-4.6	25.0
Benzo(a)pyrene	1.376	1.326	0.700	-3.6	25.0
Indeno(1,2,3-cd)pyrene	1.365	1.594	0.500	16.8	25.0
Dibenzo(a,h)anthracene	1.303	1.451	0.400	11.4	25.0
Nitrobenzene-d5	0.472	0.405	0.200	-14.2	25.0
2-Fluorobiphenyl	1.283	1.204	0.700	-6.2	25.0
Terphenyl-d14	0.997	0.919	0.500	-7.8	25.0
Phenol-d5	1.661	1.425	0.800	-14.2	25.0
2-Fluorophenol	1.259	1.028	0.600	-18.3	25.0
2,4,6-Tribromophenol	0.181	0.174		-3.9	
2-Chlorophenol-d4	1.223	1.165	0.800	-4.7	25.0
1,2-Dichlorobenzene-d4	0.891	0.900	0.400	1.0	25.0

All other compounds must meet a minimum RRF of 0.010.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R214

EPA Sample No. (SSTD050##): SSTD050GD Date Analyzed: 07/12/01

Lab File ID (Standard): HG010712C66 Time Analyzed: 0104

Instrument ID: 5972HP66 GC Column: ZB-5MS ID:0.25(m

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	111215	5.89	394013	7.67	252924	10.21
	UPPER LIMIT	222430	6.39	788026	8.17	505848	10.71
	LOWER LIMIT	55608	5.39	197006	7.17	126462	9.71
	EPA SAMPLE NO.						
01	SBLKUO	93467	5.88	319098	7.66	198595	10.20
02	SR-11	114791	5.86	391517	7.63	263840	10.17
03	SR-12	96264	5.86	317756	7.62	214001	10.16
04	SR-13	106628	5.86	342316	7.62	225125	10.18
05	SR-14	97068	5.86	363274	7.62	242069	10.16
06	SR-15	106637	5.84	365495	7.62	251128	10.16
07	SR-16	101612	5.84	351628	7.60	247032	10.14
08	SR-17	103215	5.84	383711	7.60	253241	10.14
09	SR-18	92636	5.83	333588	7.61	228580	10.15
10	SR-19	92149	5.82	344930	7.60	239222	10.14
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits

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8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM | Contract: OLM04-REVS

Lab Code: LIBRTY | Case No.: | SAS No.: | SDG No.: R214

EPA Sample No. (SSTD050##): SSTD050GD | Date Analyzed: 07/12/01

Lab File ID (Standard): HG010712C66 | Time Analyzed: 0104

Instrument ID: 5972HP66 | GC Column: ZB-5MS | ID:0.25(m

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	466473	12.34	492867	16.18	359965	19.45
	UPPER LIMIT	932946	12.84	985734	16.68	719930	19.95
	LOWER LIMIT	233236	11.84	246434	15.68	179982	18.95
	EPA SAMPLE NO.						
01	SBLKUO	348750	12.31	358823	16.16	260449	19.44
02	SR-11	435468	12.29	411254	16.15	300247	19.44
03	SR-12	380147	12.28	393436	16.16	275751	19.44
04	SR-13	450740	12.31	457768	16.29	359283	19.49
05	SR-14	416219	12.28	488078	16.17	375249	19.49
06	SR-15	419408	12.29	477629	16.20	363906	19.52
07	SR-16	435855	12.28	486715	16.21	377573	19.61
08	SR-17	432937	12.26	481205	16.17	374434	19.49
09	SR-18	376533	12.26	423916	16.16	323890	19.44
10	SR-19	399142	12.26	450949	16.17	328966	19.49
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22							

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits

COMPUCHEM a division of Liberty Analytical Corp DATE 7/12/01 INITIAL TIME OF TUNE 0045 SHIFT/S(A)____ (B)____ (C)✓

GC/MS SEMIVOLATILE RUN LOG TIME TUNE EXPIRES 1245 LINKER /METHOD OLM04

COMPUCHEM .LOGBOOK 4 X(4) 2 (5972hp66)

PREVENTIVE MAINTENANCE None

		FILE NAME		DATE	TIME	CLIENT ID#	CASE/SDG#	AMOUNT INJECTED	CHEMIST	COMMENTS(ETC.)/DISPOSITION
1		DF010712C66		7/12/01	0045	DFTPP	–	2uL	2319	SCD=LCD
2		HG010712C66		/ /	0104	SSTD050GDL	–			
3		WG11422-1C66		/ /	0139	SBLKW0	VARIOUS			
4	/	FOBK4-17RDC66	DW	/ /	0215	FOC99	FOBK4			2X
5		FOCW4-3RDC66		/ /	0250	FODA4DL	FOCW4			12X FOCW4-3RDC66 GM 7/12/01
6		FOBK4-17D2RC66		/ /	0325	FOC99DL	FOBK4			10X
7		FOCH4-19DC66		/ /	0400	FODB4DL	FOCH4			2X
8		WG11422-4C66		/ /	0435	FOC63MS	FOCA0			
9		WG11422-5C66		/ /	0511	FOC63MSD	↓			
10		R2141-1C66		/ /	0546	SR-11	R2141			
11		WG11422-2C66		/ /	0621	1MS	not reported			
12		WG11422-3C66		/ /	0656	1MSD				
13		R2141-2C66		/ /	0731	SR-12				
14		R2141-3C66		/ /	0807	SR-13				
15		R2141-4C66		/ /	0842	SR-14				
16	/	R2141-5C66	DI	/ /	0917	SR-15				
17	/	R2141-6C66	DI	/ /	0953	SR-16				
18		R2141-7C66		/ /	1028	SR-17				
19		R2141-8C66		/ /	1103	SR-18				
20		R2141-9C66		/ /	1139	SR-19				
21	/	R2141-10C66	DI	/ /	1214	SR-20	↓	↓	↓	← not reported
22				/ /						
23				/ / GM	7-12-01					
24				/ /						

	Tune	STANDARDS Analytical	Int. Std.	Column Type
Std. ID #	7055	2437	800	2B-5MS 0.25mm
Lot #	51435	51676	51818	

SUPERVISOR APPROVAL [signature]

DATE 7/12/1

The presence of the Chemist's employee ID number, or signature, on this run log attests that strict compliance with the method's SO occurred. Any SOP deviations require documentation by the responsible chemist together with the chemist's initials and the initials lab supervisor and a QA department representative, signifying approval of the deviation. 2/2/01:m

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Lab File ID: DF010712A66 DFTPP Injection Date: 07/12/01

Instrument ID: 5972HP66 DFTPP Injection Time: 1331

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	54.8
68	Less than 2.0% of mass 69	0.0 (0.0
69	Mass 69 relative abundance	63.8
70	Less than 2.0% of mass 69	0.0 (0.0
127	25.0 - 75.0% of mass 198	46.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.4
275	10.0 - 30.0% of mass 198	22.8
365	Greater than 0.75% of mass 198	3.03
441	Present, but less than mass 443	14.7
442	40.0 - 110.0% of mass 198	90.7
443	15.0 - 24.0% of mass 442	17.6 (19.5

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDAR

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050GE	SSTD050GE	HG010712A66	07/12/01	1351
02	SR-15DL	R2141-5	R2141-5DA66	07/12/01	1427
03	SR-16DL	R2141-6	R2141-6DA66	07/12/01	1502
04	SR-20	R2141-10	R2141-10DA66	07/12/01	1538
05	DUPLICATE2	R2141-12	R2141-12DA66	07/12/01	1648
06	SR-21	R2141-11	R2141-11JA66	07/12/01	2240
07	SR-9	R2141-13	R2141-13JA66	07/12/01	2315
08	SR-10	R2141-14	R2141-14D2A66	07/13/01	0027
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: COMPUCHEM Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Instrument ID: 5972HP66 Calibration Date: 07/12/01 Time: 1351

Lab File ID: HG010712A66 Init. Calib. Date(s): 05/31/01 05/31/

EPA Sample No.(SSTD050##): SSTD050GE Init. Calib. Times: 1107 1345

GC Column: ZB-5MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Dibenzofuran	1.634	1.667	0.800	2.0	25.0
Benzo(a)anthracene	1.287	1.216	0.800	-5.5	25.0
Benzo(b)fluoranthene	1.619	1.570	0.700	-3.0	25.0
Benzo(a)pyrene	1.376	1.341	0.700	-2.5	25.0
Indeno(1,2,3-cd)pyrene	1.365	1.208	0.500	-11.5	25.0
Dibenzo(a,h)anthracene	1.303	1.297	0.400	-0.5	25.0
Nitrobenzene-d5	0.472	0.454	0.200	-3.8	25.0
2-Fluorobiphenyl	1.283	1.270	0.700	-1.0	25.0
Terphenyl-d14	0.997	0.885	0.500	-11.2	25.0
Phenol-d5	1.661	1.422	0.800	-14.4	25.0
2-Fluorophenol	1.259	1.064	0.600	-15.5	25.0
2,4,6-Tribromophenol	0.181	0.179		-1.1	
2-Chlorophenol-d4	1.223	1.182	0.800	-3.4	25.0
1,2-Dichlorobenzene-d4	0.891	0.893	0.400	0.2	25.0

All other compounds must meet a minimum RRF of 0.010.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM | Contract: OLM04-REVS

Lab Code: LIBRTY | Case No.: | SAS No.: | SDG No.: R2141

EPA Sample No. (SSTD050##): SSTD050GE | Date Analyzed: 07/12/01

Lab File ID (Standard): HG010712A66 | Time Analyzed: 1351

Instrument ID: 5972HP66 | GC Column: ZB-5MS | ID:0.25(mm

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	12 HOUR STD	109741	6.35	368627	8.09	224620	10.50
	UPPER LIMIT	219482	6.85	737254	8.59	449240	11.00
	LOWER LIMIT	54870	5.85	184314	7.59	112310	10.00
	EPA SAMPLE NO.						
01	SR-15DL	144553	6.35	473475	8.08	291186	10.50
02	SR-16DL	132119	6.35	420946	8.07	259816	10.50
03	SR-20	125625	6.35	386705	8.09	244011	10.50
04	DUPLICATE2	124510	6.35	381158	8.09	236695	10.49
05	SR-21	141702	6.35	449322	8.07	274552	10.50
06	SR-9	142233	6.35	470550	8.07	285195	10.50
07	SR-10	151838	6.33	481822	8.07	298356	10.50
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits

8C

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: COMPUCHEM | Contract: OLM04-REVS

Lab Code: LIBRTY Case No.: | SAS No.: SDG No.: R2141

EPA Sample No. (SSTD050##): SSTD050GE | Date Analyzed: 07/12/01

Lab File ID (Standard): HG010712A66 | Time Analyzed: 1351

Instrument ID: 5972HP66 | GC Column: ZB-5MS ID:0.25(mm

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	12 HOUR STD	381719	12.51	386079	16.25	270069	19.57
	UPPER LIMIT	763438	13.01	772158	16.75	540138	20.07
	LOWER LIMIT	190860	12.01	193040	15.75	135034	19.07
	EPA SAMPLE NO.						
01	SR-15DL	489009	12.51	510630	16.26	388424	19.59
02	SR-16DL	444800	12.51	455333	16.25	344802	19.62
03	SR-20	420128	12.51	432251	16.25	325066	19.59
04	DUPLICATE2	410080	12.51	433293	16.25	308105	19.60
05	SR-21	459870	12.51	490545	16.27	311062	19.64
06	SR-9	459799	12.51	484505	16.25	315737	19.64
07	SR-10	469560	12.51	490585	16.25	331880	19.61
08							
09							
10							
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12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits

COMPUCHEM a division of Liberty Analytical Corp DATE 7/12/01 INITIAL TIME OF TUNE 1331 SHIFT/S(A) ✓ (B)____ (C)____

GC/MS SEMIVOLATILE RUN LOG TIME TUNE EXPIRES 0131 LINKER /METHOD Olmo4

COMPUCHEM .LOGBOOK 4 X(4) 2 (5972hp66)

PREVENTIVE MAINTENANCE None

273 387

		FILE NAME		DATE	TIME	CLIENT ID#	CASE/SDG#	AMOUNT INJECTED	CHEMIST	COMMENTS(ETC)/DISPOSITION
1		DFU10712A66		7/12/01	1331	DFTPP		2 ul	917	SCD=LCD
2		HG010712A66		/ /	1351	SSTD050GE				
3		R2141-5DA66		/ /	1427	SR-15DL	R2141			4x
4		R2141-6DA66		/ /	1502	SR-16DL				4x
5		R2141-10DA66		/ /	1538	SR-20DL				12x
6	/	R2141-11DA66	RN	/ /	1613	SR-21				5x ← see initial analysis
7		R2141-12DA66		/ /	1648	DUPLICATE2				5x
8	/	R2141-13DA66	RN	/ /	1723	SR-9				5x ← not reported
9	/	R2141-14DA66	RN	/ /	1758	SR-10				5x ← not reported
10		MOCKBLK1A66		/ /	1833	MOCK1	—			
11		WG11423-1A66		/ /	1909	SBLKUP	VARIOUS			
12	/	FOCW4-1A66	DI	/ /	1944	FOCW4	FOCW4			
13		WG11423-2A66		/ /	2019	MS				
14		WG11423-3A66		/ /	2055	MSD				
15		FOCR4-19A66		/ /	2130	FOCJ1	FOCR4			
16		FOCR4-20A66		/ /	2205	FOCJ2				
17		R2141-11JA66		/ /	2240	SR-21	R2141		2319	
18		R2141-13JA66		/ /	2315	SR-9				
19	/	R2141-14JA66	DI	/ /	2350	SR-10				←
20		R2141-14D2A66		7/13/01	0027					2x ←
21		FOCW4-1DA66		/ /	0103	FOCW4	FOCW4			7x
22				/ /						
23				/ /		FN 7/12/01				
24				/ /						

STANDARDS

	Tune	Analytical	Int. Std.	Column Type
Std. ID #	7055	2437	800	ZB-5MS
Lot #	51435	51676	51818	0.25 mm

SUPERVISOR APPROVAL [signature]

DATE 7-13-01

The presence of the Chemist's employee ID number, or signature, on this run log attests that strict compliance with the method's SOP has occurred. Any SOP deviations require documentation by the responsible chemist together with the chemist's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation.

DF010706B60

7.6.2

COMPUCHEM a division of Liberty Analytical Corp.

SEMI-VOLATILE GPC WEEKLY METHYLENE CHLORIDE BLANK

USEPA CLP SOW

TECHNICIAN NAME: C. Hosky DATE RAN: 7/6/01

EMPLOYEE ID: 1787 GPC INSTRUMENT #: ABC GPC # 4

SAMPLE ID NUMBER	GPC INJ. VOLUME	FINAL VOLUME	COMMENTS
A40706B	5.0 ml	0.5 ml	METHYLENE CHLORIDE BLANK
			MANUFACTURER & LOT # J T Baker V16416

* COMPLETE SAMPLE ID NUMBER USING GPC COLUMN NUMBER ALONG WITH MONTH AND DATE. (i.e. A10202B)

RUN WEEKLY GPC CALIBRATION THROUGH GPC CLEANUP EVERY SEVEN CALENDAR DAYS AND SUBMIT TO GC/MS FOR ANALYSIS.

A40706B = METHYLENE CHLORIDE ONLY.

SUPERVISOR REVIEW: CH

FINAL VOLUME VERIFIED: Carl A Kirby

EXTRACTS RECEIVED BY: Temp storage

SemiVOAGPCWklyMethChlorBlank.doc:mlj

COMPUCHEM a division of Liberty Analytical CORP. LOGBOOK 2 R 11

GPC Weekly Calibration Log: ABC #4

Tape a copy of the U/V trace in the space below. Make copies of this page and attach them to the associate extraction sheets. Label each peak on the U/V trace with the compound name. Show resolution calculations.

Date/Time: 6/27/01 10:20AM Room Temp: 22.5 Technician Name/ID: C. Hahn / 1787

GPC calibration standards (listed in order of elution)	Time (min) Or (CM)	RSD (%)
Corn oil		
Bis(2-ethylhexyl)phthalate	7.7	0
Methoxychlor		
Perylene	12.25	0.4
Sulfur		

Lot No. of GPC Calibration Standard Used 51485

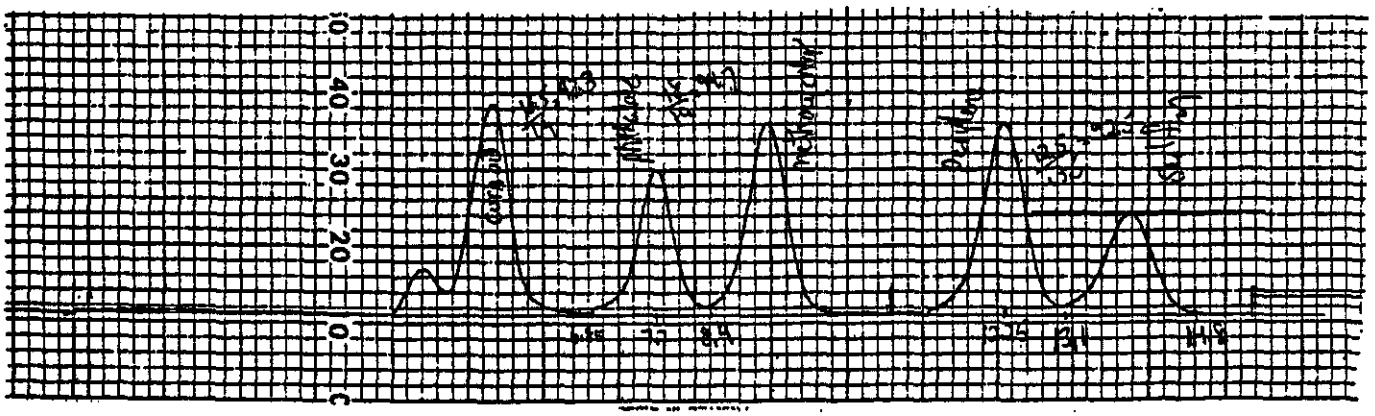
Acceptance criteria: ± 5.0% change from previous calibration (Do not round.)
Retention time criteria met. (Y) N

Calculate and record retention time shift from the previous calibration/UV trace.

Flow Rate: 5.0 ml/min Column: Bio-Beads Chart Speed: 15 cm/hr

Column Pressure: 8 psi

Pest/PCB		Semivolatiles
Dump Time: 33:24 min	> 85% resolution between corn oil and phthalate (Y) N	Dump Time: 27:24 min
Collect Time: 18:48 min	> 85% resolution between phthalate and methoxychlor (Y) N	Collect Time: 25:00 min
Collect Volume: 94 ml	> 90% resolution between perylene and sulfur (Y) N	Collect Volume: 100 ml
Wash Time: 10:00 min		Wash Time: 17:00 min



Reviewed By: M. Bolton Date: 6/29/01

1717

4/7/00:mlj

430
29

COMPUCHEM a division of Liberty Analytical CORP. LOGBOOK 2 R 11

GPC Weekly Calibration Log: ABC #4

Tape a copy of the U/V trace in the space below. Make copies of this page and attach them to the associate extraction sheets. Label each peak on the U/V trace with the compound name. Show resolution calculations.

Date/Time: 7/6/01 10:00am Room Temp: 22.4 Technician Name/ID: C. Hurley / 1787

GPC calibration standards (listed in order of elution)	Time (min) Or (CM)	RSD (%)
Corn oil		
Bis(2-ethylhexyl)phthalate	~~7.9~~ 7.4 (at 7/6/01)	~~2.56~~ 3.9
Methoxychlor		
Perylene	11.8	3.74
Sulfur		

Lot No. of GPC Calibration Standard Used 5148 S

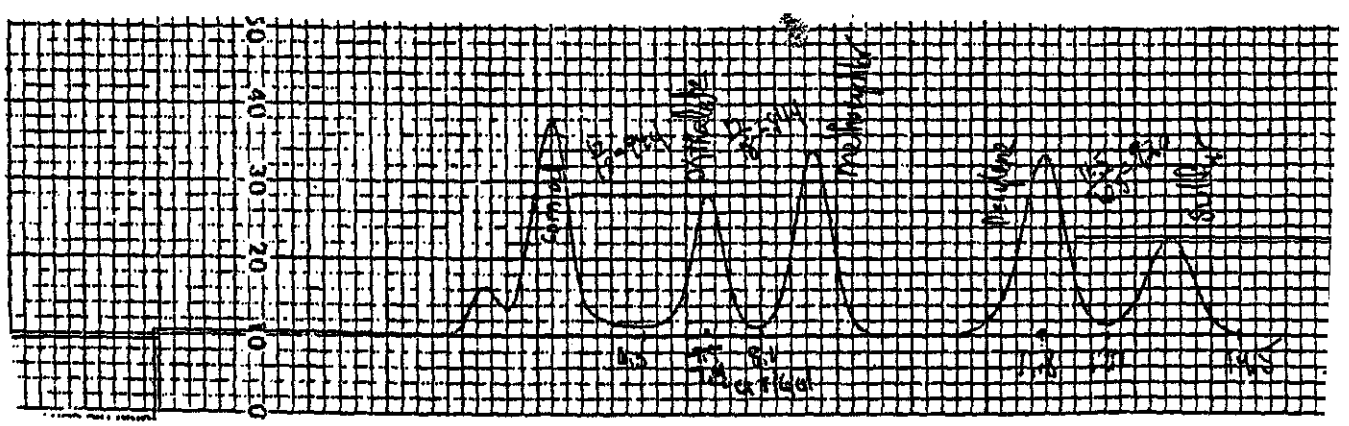
Acceptance criteria: ± 5.0% change from previous calibration (Do not round.)
Retention time criteria met. (Y) N

Calculate and record retention time shif from the previous calibration/UV trace.

Flow Rate: 5.0 ml/min Column: Bio-Beads Chart Speed: 15 cm/hr

Column Pressure: 8 psi

Pest/PCB		Semivolatiles
Dump Time: 32:24 min	> 85% resolution between corn oil and phthalate (Y) N	Dump Time: 26:00 min
Collect Time: 18:24 min	> 85% resolution between phthalate and methoxychlor (Y) N	Collect Time: 24:48 min
Collect Volume: 92 ml	> 90% resolution between perylene and sulfur (Y) N	Collect Volume: 124 ml
Wash Time: 10:00 min		Wash Time: 17:00 min



Reviewed By: [signature] Date: 7/6/01

1718

4/7/00 mb

428
30

COMPUCHEM a division of Liberty Analytical Corp DATE 7/6/01 INITIAL TIME OF TUNE 2103 SHIFT/S(A)____ (B) ✓ (C)____

GC/MS SEMIVOLATILE RUN LOG TIME TUNE EXPIRES 0903 LINKER /METHOD OLM04

COMPUCHEM .LOGBOOK 4 V(4) 2 (5972hp60)

PREVENTIVE MAINTENANCE None

262
437

	INJECTED	FILE NAME	REPORTED	DATE	TIME	CLIENT ID#	CASE/SDG#	AMOUNT INJECTED	CHEMIST	COMMENTS(ETC.)/DISPOSITION
1		DF010706B60	/	7/6/01	2103	DFTPP	—	2uL	2319	SCD=LCD
2		HG010706B60	/	/ /	2126	SSTD050CX	—			
3		A10705BB60	/	/ /	2210	ABC GPC #1	—			
4		A40706BB60	/	/ /	2253	ABC GPC #4	—			
5		FOC94-16B60	/	/ /	2336	FOCP8	FOC94			
6		FOC94-17B60	/	7/7/01	0019	FOCP9				
7		FOC94-18B60	/	/ /	0101	FOCQØ				
8		FOC94-19B60	/	/ /	0143	FOCXØ				
9		FOC94-20B60	/	/ /	0226	FOCW6				
10		WG11215-2B60	/	/ /	0309	MS				
11		WG11215-3B60	/	/ /	0352	MSD				
12		FOC94-10B60	/	/ /	0434	FOC94				3x
13		FOC94-12DB60	/	/ /	0517	FOCNDDL				20x
14				/ /		out of Samples				
15				/ /						
16				/ /						
17				/ /						
18				/ /						
19				/ /						
20				/ /						
21				/ /						
22				/ /						
23				/ /						
24				/ /						

	Tune	STANDARDS Analytical	Int. Std.	Column Type
Std. ID #	7055	2437	800	J&W DB-5.625 0.32mm
Lot #	51435	51676	51666	

SUPERVISOR APPROVAL [signature]

DATE 7/7/01

The presence of the Chemist's employee ID number, or signature, on this run log attests that strict compliance with the method's SOP has occurred. Any SOP deviations require documentation by the responsible chemist together with the chemist's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation.

12/22/00:mlj

Semi-Volatile Low. Level Soil EPA CLP SOW OLM 4.2

COMPUCHEM

ASSIGNED TO Johnny EMPLOYEE ID # 2449 DATE EXTRACTED/POSTED 7/10/01

-738

406

7-11-2

	Sample Number	Case #	QC SAMPLES TYPE	Sample Weight (g)	Final Volume (ml)	GPC Final Vol (ml)	COMMENTS
1	RZ141-1			30.0	10.0	0.5	
2	2			30.0	10.0		
3	3			30.0	10.0		
4	4			30.0	10.0		
5	5			30.0	10.0		
6	6			30.0	10.0		
7	7			30.0	10.0		
8	8			30.0	10.0		
9	9			30.0	10.0		
10	10			30.0	10.0		
11	11			30.0	10.0		
12	12			30.0	10.0		
13	13			30.0	10.0		
14	14			30.0	10.0		
15	WB11422-2	SS		30.0	10.0		use RZ141-1 for 2/3 SS
16	-3	SS		30.0	10.0		
17	-4	SS		30.0	10.0		use FOCA0-3 for 4/5 SS
18	-5	SS		30.0	10.0		
19					10.0		
20					10.0		
21					10.0		
22					10.0		NB 7/10/01
23	WB11422-1		BLK	30.0	10.0	0.5	
24			LCS		10.0		NB 7/10/01

GPC Instr. # 4

GPC Calib Date A 7/6/01

GPC Run Date 7/10/01

FINAL VOLUME VERIFIED:

REVIEWED BY:

	ID#	AMT	LOT #
SURROGATE	431	0.5 ml	51617
SPIKE	8003	0.5 ml	51757
Date GPC MeC12 Blank Done	7/6/01		

SURR. & SPIKE ADDED BY

INITIALS DATE

Witness BS / 7/10/01

Initials Date

Analysts initials. Extracted JS KD JS/BS/NB N2 NB Bottle up JS/BS/NB

MANUFACTURER AND LOT NO. OF REAGENTS/SOLVENTS USED Na_2SO_4 41067116 CH_2Cl_2 CA072 Acetone CB042

Rev 2/23/01

SECTION 4

INORGANIC DATA SUPPORT DOCUMENTATION

Inorganic Analyses Support Documentation

Environmental Standards Project Name: Penn E&R/LPT DV
Sample Collection Dates: 7/2 and 7/3/01
Job Number: 41101699.A000
Project Manager: DJL
Laboratory: Compu Chem

Reviewed By: D. Lancaster
Approved By: MAM
Completion Date: 11/19/01

Applicable Sample No's.: ☒ Refer to Table 1 in the Quality Assurance Review

Deliverables:		Sample No.	Lab. Control No.
CLP	☑		
Tier I	☐	— See Table 1 —	
Tier II	☐		
Limited	☐		
Other			

The following table indicates criteria which were examined, the identified problems, and support documentation attachments.

SDG R2141

	Criteria Examined in Detail (Check (✓) if Yes or Footnote Letter for Comments Below)					Problems Identified (Check (✓) if Yes or Footnote Number for Comments Below)					Support Documentation Attachments (Check (✓) if Yes — or Identify Attachment No.)				
	ICP or A.A Metals	Furnace Metals	Cold Vapor Mercury	Cyanide	Other Method(s)	ICP or A.A Metals	Furnace Metals	Cold Vapor Mercury	Cyanide	Other Method(s)	ICP or A.A Metals	Furnace Metals	Cold Vapor Mercury	Cyanide	Other Method(s)
Holding Times	✓										✓				
Blank Analysis Results	✓										✓				
Matrix Spike (Predigestion) Results	✓										✓				
Duplicate Analysis Results ☑ Field ☑ Lab	✓										✓				
Quantitation of Results	✓										✓				
Detection Limits / Sensitivity	✓										✓				
Initial Calibrations	✓										✓				
Continuing Calibrations	✓										✓				
Laboratory Control Standards (LCS)	✓										✓				
ICP Linear Range Analysis	✓										✓				
ICP Interference Checks	✓										✓				
ICP Serial Dilutions	✓										✓				
ICP Post-Digestion Spike	✓										✓				
GFAA Post-Digestion Spikes															
GFAA Duplicate Injections															
ICP Multiple Exposures	✓										✓				
GFAA Standard Additions															
CRDL Standards	✓										✓				
Others:															

Comments: Pb analysis only by CLP protocols

BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

MATRIX (Aq., S)	BLANK TYPE (✓) METHOD ICB	CCB	PREP.	TRIP	EQUIPMENT	FIELD	BLANK SAMPLE NUMBER	CONTAMINANT	CONCENTRATION (units)	QUALIFICATION LIMIT FOR AQUEOUS SAMPLES (ug/L) 5x	QUALIFICATION LIMIT FOR SOLID SAMPLES (mg/Kg) 5x
							No positive results were observed				
								in the ICB, CCB, or			
								prep blank in this SDG.			

Aq. = Aqueous; S = Solid

Notes: _____

EVALUATION OF INORGANIC DUPLICATE ANALYSIS PRECISION

PRECISION OBJECTIVES		Compound > or = 5 X PRDL	Compound < 5 X PRDL
All Parameters	Aqueous	RPD < or = 20%	Difference < or = PRDL
	Solid	RPD < or = 40%	Difference < or = 2 X PRDL

Sample Identification #1: SR-20 Units (enter one): ug/L, mg/l, ug/kg, or mg/kg

Sample Identification #2: Duplicate2 UNITS: ug/kg

ANALYTE	SAMPLE ANALYTE CONCENTRATION	Q	DUPLICATE SAMPLE ANALYTE CONCENTRATION	Q	RELATIVE PERCENT DIFFERENCE (RPD)	PRDL	NOTES
lead	38.40		33.90		12	0.60	IN

NOTES:

1) Both results are > or = 5 X PRDL and RPD over acceptance limit, flag positive results "J".

2) At least one of the results is < 5 X PRDL and difference is over acceptance limit, flag positive results "J" and "not-detected" results "UJ".

Q) The column in which the qualifier code is entered to indicate if the analyte was not-detected or qualitatively questionable in the sample.

U) The analyte was not-detected in the sample at or above the associated numerical value. The numerical value will be used for comparison purposes.

N.C.) The RPD was not calculated because one of the results was not-detected.

U*/B) The result was blank qualified. The numerical value will be used for comparison purposes.

Comments:

U.S. EPA-CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2141

SOW No.: ILM04.0

EPA Sample No.	Lab Sample ID.
DUPLICATE2	R2141-12
SR-10	R2141-14
SR-11	R2141-1
SR-11D	WG11381-2
SR-11S	WG11381-1
SR-12	R2141-2
SR-13	R2141-3
SR-14	R2141-4
SR-15	R2141-5
SR-16	R2141-6
SR-17	R2141-7
SR-18	R2141-8
SR-19	R2141-9
SR-20	R2141-10
SR-21	R2141-11
SR-9	R2141-13

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Mary K Powell Name: Mary K Powell

Date: July 23, 2001 Title: Data Reviewer II

U.S. EPA-CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

Initial Calibration Source: EPA-LV

Continuing Calibration Source: HIPUR

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Lead	99.8	104.60	104.8	1000.0	1027.25	102.7	1024.66	102.5	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA-CLP
2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

Initial Calibration Source: EPA-LV

Continuing Calibration Source: HIPUR

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Lead				1000.0	1018.07	101.8	1018.55	101.8	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA-CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

Initial Calibration Source: EPA-LV

Continuing Calibration Source: HIPUR

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Lead				1000.0	1025.86	102.6			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA-CLP
2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

Initial Calibration Source: EPA-LV

Continuing Calibration Source: HIPUR

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Lead	99.8	105.54	105.8	1000.0	1012.05	101.2	1007.21	100.7	P

Associated with serial dilution analysis only

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA-CLP

2B

CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2141

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Lead				6.0	5.06	84.3	4.45	74.2

Control Limits: no limits have been established by EPA at this time

Region III Limits: 90-110%

All sample results > 3x CRDL,

no qualification necessary

U.S. EPA-CLP

2B

CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBERTY Case No.: _____ SAS No.: _____ SDG No.: R2141

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Lead				6.0			4.53	75.5

Control Limits: no limits have been established by EPA at this time

U.S. EPA-CLP

2B

CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2141

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Lead				6.0	2.78	46.3	7.39	123.2

LRS std result

Control Limits: no limits have been established by EPA at this time

Not associated with field samples

U.S. EPA-CLP

2B

CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R2141

AA CRDL Standard Source: HIPUR

ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Lead				6.0			6.01	100.2

Control Limits: no limits have been established by EPA at this time

U.S. EPA-CLP

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Lead	1.6	U	-1.6	~~B~~	1.6	U	1.6	U	-.506	~~B~~	P

Negative results-
all samples displayed
positive results > 5x highest
negative CCB/Prep Blank result.
No qualification necessary.

U.S. EPA-CLP

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Lead			-2.4	B	-2.5	B					P

U.S. EPA-CLP

3

BLANKS

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Lead	1.6	U	1.6	U	1.6	U					P

Associated with serial dilution analysis only

U.S. EPA-CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBERTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

ICP ID Number: P4 ICS Source: EPA

2x IDL = 3.6 µg/L

Concentration Units): ug/L

Analyte	True Sol.A	True Sol.AB	Initial Found Sol.A	Initial Found Sol.AB	Initial Found %R	Final Found Sol.A	Final Found Sol.AB	Final Found %R
Lead	0	47	-4	46.2	98.3	-2	47.0	100.0
Al			500295	497373		510055	504816.8	
Ca			492088	488297		491972	486102.6	
Fe			204783	203066		205025	202216.0	
Mg			552499	545492		553379	543583.9	

Samples with high levels of interferents:

Sample	Pb inst. level
SR-12	17.9 µg/L
SR-16	63.6 µg/L
SR-17	104.0 µg/L
Duplicate 2	158.8 µg/L
SR-9	74.2 µg/L

Only SR-12 has instrument level less than 5x ICSA level for Pb; flag positive result for Pb "J" in SR-12

L

U.S. EPA-CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

ICP ID Number: P4 ICS Source: EPA

Concentration Units): ug/L

Analyte	True Sol.A	True Sol.AB	Initial Found Sol.A	Initial Found Sol.AB	Initial Found %R	Final Found Sol.A	Final Found Sol.AB	Final Found %R
Lead	0	47				-4	46.4	98.7

Al	514557	506609.8
Ca	492729	484550.3
Fe	205716	202199.0
Mg	557106	546722.4

U.S. EPA-CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

ICP ID Number: P4 ICS Source: EPA

Concentration Units): ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Lead	0	47	1	50.0	106.4	4	46.7	99.4

Associated with serial dilution analysis only

U.S. EPA-CLP
5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

SR-11S

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 92.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Lead	75 - 125	14.1194		9.6909		4.32	102.5		P

Comments: _____

U.S. EPA-CLP

6

DUPLICATES

EPA SAMPLE NO.

SR-11D

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 92.5 % Solids for Duplicate: 87.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Lead		9.6909		10.6896		9.8		P

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7

LABORATORY CONTROL SAMPLE

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

Solid LCS Source: ERA

Aqueous LCS Source: _____

Analyte	Aqueous (ug/L) True	Aqueous (ug/L) Found	Aqueous (ug/L) %R	Solid (mg/kg) True	Solid (mg/kg) Found	Solid (mg/kg) C	Solid (mg/kg) Limits	Solid (mg/kg) %R
Lead				138.0	144.5		105.0 170.0	104.7

U.S. EPA-CLP
9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

SR-11L

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Lead	44.82	✓	51.25	✓	14.3		P

First analysis: 57.61 28.5%

< 50 x IDL (80 µg/L) - qualification not necessary

U.S. EPA-CLP
13

PREPARATION LOG

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

Method: P

EPA Sample No.	Preparation Date	Weight (grams)	Volume (mL)
DUPLICATE2	07/13/01	1.08	200
LCSS	07/13/01	1.00	200
PBS	07/13/01	1.00	200
SR-10	07/13/01	1.05	200
SR-11	07/13/01	1.00	200
SR-11D	07/13/01	1.00	200
SR-11S	07/13/01	1.00	200
SR-12	07/13/01	1.03	200
SR-13	07/13/01	1.02	200
SR-14	07/13/01	1.01	200
SR-15	07/13/01	1.02	200
SR-16	07/13/01	1.00	200
SR-17	07/13/01	1.02	200
SR-18	07/13/01	1.03	200
SR-19	07/13/01	1.04	200
SR-20	07/13/01	1.04	200
SR-21	07/13/01	1.07	200
SR-9	07/13/01	1.00	200

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10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

ICP ID Number: P4 Date: 07/20/01

samples analyzed on 7/19

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Lead	220.35		3	1.6	P

Comments:

U.S. EPA-CLP

11A

ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

ICP ID Number: P4 Date: 7/19/01

Analyte	Wave-length (nm)	Interelement Correction Factors for:				
		Al	Ca	Fe	Mg	Ag
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Boron	223.061	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	-0.0000100	0.0000000	0.0000170	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.70	0.0000000	0.0000000	0.0000580	0.0000000	0.0000000
Iron	271.44	0.0000000	0.0000000	0.0000000	-0.006740	0.0000000
Lead	220.351	0.0002380	0.0000000	0.0000910	0.0000000	0.0000000
Lead	220.352	-0.0001600	0.0000000	0.0000400	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0002330	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000130	0.0000150	0.0000000
Mercury						
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.021	0.0000000	0.0000000	0.0000540	0.0000000	0.0000000
Selenium	196.022	0.0000000	0.0000000	-0.0004950	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	-0.0000350	0.0000000	0.0000000
Sodium	330.23	0.0000000	-0.0005370	0.0000000	0.0000000	0.0000000
Thallium	190.86	0.0000000	0.0000000	0.0004740	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000320	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

U.S. EPA-CLP

11B

ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG NO.: R2141

ICP ID Number: P4 Date: 7/19/01

Analyte	Wave-length (nm)	Interelement Correction Factors for:				
		As	Ba	Be	Cd	Co
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Boron	223.061	0.0000000	0.0000000	0.0000000	0.0000000	-0.0030520
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	-0.0001330
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0012300	0.0000000	0.0000000	0.0000000
Copper	324.70	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Iron	271.44	0.0000000	0.0000000	0.0000000	0.0000000	0.0817500
Lead	220.351	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.352	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Mercury						
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.021	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.022	0.0000000	0.0000000	0.0000000	0.0000000	-0.0043800
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	330.23	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.86	0.0000000	0.0000000	0.0000000	0.0000000	0.0027320
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments: _____

U.S. EPA-CLP
11B
ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: COMPUCHEM Contract:

Lab Code: LIBERTY Case No.: SAS No.: SDG NO.: R2141

ICP ID Number: P4 Date: 7/19/01

Analyte	Wave-length (nm)	Interelement Correction Factors for:				
		Cr	Cu	K	Mn	Na
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0057320	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0002300	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Boron	223.061	0.0004980	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.70	0.0006010	0.0000000	0.0000000	0.0000000	0.0000000
Iron	271.44	0.0027330	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.351	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.352	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Mercury						
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.021	-0.0002440	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.022	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	330.23	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.86	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	-0.0013830	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

U.S. EPA-CLP

11B

ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

ICP ID Number: P4 Date: 7/19/01

Analyte	Wave-length (nm)	Interelement Correction Factors for:				
		Ni	Pb	Sb	Se	Ti
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Arsenic	189.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Barium	493.41	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Boron	223.061	0.0000000	0.0000000	0.0000000	0.0000000	-0.0027610
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cobalt	228.62	0.0000000	0.0000000	0.0000000	0.0000000	0.0019940
Copper	324.70	0.0000000	0.0000000	0.0000000	0.0000000	0.1249700
Iron	271.44	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.351	0.0029800	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.352	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Mercury						
Nickel	231.60	0.0000000	0.0000000	-0.0009550	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.021	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.022	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.068	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	330.23	0.0000000	0.0000000	0.0000000	0.0000000	-0.1282000
Thallium	190.86	0.0000000	0.0000000	0.0000000	0.0000000	-0.0039320
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

U.S. EPA-CLP

11B

ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

ICP ID Number: P4 Date: 7/19/01

Analyte	Wave-length (nm)	Interelement Correction Factors for: Tl	V	Zn		
Aluminum	308.21	0.0000000	0.0029910	0.0000000		
Antimony	206.84	0.0000000	-0.0010590	0.0000000		
Arsenic	189.04	0.0000000	0.0000000	0.0000000		
Barium	493.41	0.0000000	0.0000000	0.0000000		
Beryllium	313.04	0.0000000	0.0009110	0.0000000		
Boron	223.061	0.0000000	0.0000000	0.0000000		
Cadmium	226.50	0.0000000	0.0000000	0.0000000		
Calcium	317.93	0.0000000	0.0000000	0.0000000		
Chromium	267.72	0.0000000	0.0000000	0.0000000		
Cobalt	228.62	0.0000000	0.0000000	0.0000000		
Copper	324.70	0.0000000	0.0000000	0.0000000		
Iron	271.44	0.0000000	0.0146080	0.0000000		
Lead	220.351	0.0000000	0.0000000	0.0000000		
Lead	220.352	0.0000000	0.0000000	0.0000000		
Magnesium	279.08	0.0000000	0.0000000	0.0000000		
Manganese	257.61	0.0000000	0.0000000	0.0000000		
Mercury						
Nickel	231.60	0.0000000	0.0000000	0.0000000		
Potassium	766.49	0.0000000	0.0000000	0.0000000		
Selenium	196.021	0.0000000	0.0000000	0.0000000		
Selenium	196.022	0.0000000	0.0000000	0.0000000		
Silver	328.068	0.0000000	0.0000000	0.0000000		
Sodium	330.23	0.0000000	0.0000000	-3.0302999		
Thallium	190.86	0.0000000	-0.0031400	0.0000000		
Vanadium	292.40	0.0000000	0.0000000	0.0000000		
Zinc	206.20	0.0000000	0.0000000	0.0000000		

Comments:

U.S. EPA-CLP
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ICP LINEAR RANGES (QUARTERLY)

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG NO.: R2141

ICP ID Number: P4 Date: 07/20/01

samples analyzed on 7/19

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Lead	15.00	40000.0	P

Comments:

U.S. EPA-CLP

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ANALYSIS RUN LOG

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Instrument ID Number: P4 Method: P

Start Date: 7/19/01 End Date: 7/19/01

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	1403													X												
S	1.00	1411													X												
S	1.00	1418																									
S	1.00	1423																									
S	1.00	1428																									
S	1.00	1432																									
ICV	1.00	1439																									
ICV	1.00	1447																									
ICV	1.00	1455													X												
ICB	1.00	1502													X												
ZZZZZZ	1.00	1510																									
CRI	1.00	1517													X												
ICSA	1.00	1536													X												
ICSAB	1.00	1558													X												
CCV	1.00	1606													X												
CCB	1.00	1613													X												
PBS	1.00	1628													X												
LCSS	1.00	1637													X												
SR-11S	1.00	1644													X												
SR-11	1.00	1652													X												
SR-11D	1.00	1659													X												
SR-11L	5.00	1707													( )												
SR-11A	1.00	1715																									
SR-12	1.00	1722													X												
SR-13	1.00	1730													X												
SR-14	1.00	1737													X												
CCV	1.00	1745													X												
CCB	1.00	1752													X												
SR-15	1.00	1800													X												
SR-16	1.00	1808													X												
SR-17	1.00	1815													X												
SR-18	1.00	1823													X												
SR-19	1.00	1830													X												

Non record analysis

U.S. EPA-CLP

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ANALYSIS RUN LOG

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Instrument ID Number: P4 Method: P

Start Date: 7/19/01 End Date: 7/19/01

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
SR-20	1.00	1838													X												
SR-21	1.00	1845													X												
CRI	1.00	1853													X												
ICSA	1.00	1901													X												
ICSAB	1.00	1908													X												
CCV	1.00	1916													X												
CCB	1.00	1923													X												
DUPLICATE2	1.00	1931													X												
SR-9	1.00	1939													X												
SR-10	1.00	1946													X												
ZZZZZZ	1.00	1954																									
ZZZZZZ	1.00	2001																									
ZZZZZZ	1.00	2009																									
ZZZZZZ	1.00	2017																									
ZZZZZZ	1.00	2024																									
ZZZZZZ	1.00	2032																									
ZZZZZZ	1.00	2039																									
CCV	1.00	2047													X												
CCB	1.00	2054													X												
ZZZZZZ	1.00	2102																									
ZZZZZZ	1.00	2110																									
ZZZZZZ	1.00	2117																									
ZZZZZZ	1.00	2125																									
ZZZZZZ	1.00	2132																									
ZZZZZZ	1.00	2140																									
ZZZZZZ	1.00	2147																									
CRI	1.00	2155													X												
ICSA	1.00	2203													X												
ICSAB	1.00	2210													X												
CCV	1.00	2218													X												
CCB	1.00	2225													X												

U.S. EPA-CLP

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ANALYSIS RUN LOG

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2141

Instrument ID Number: P4 Method: P

Start Date: 7/23/01 End Date: 7/23/01

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
SO	1.00	1057													X												
S	1.00	1104													X												
S	1.00	1111																									
S	1.00	1116																									
S	1.00	1121																									
S	1.00	1126																									
ICV	1.00	1131																									
ICV	1.00	1138																									
ICV	1.00	1145													X												
ICB	1.00	1152													X												
LRS	1.00	1159													X												
CRI	1.00	1207													X												
ICSA	1.00	1214													X												
ICSAB	1.00	1221													X												
CCV	1.00	1228													X												
CCB	1.00	1235													X												
SR-11L	5.00	1305													X												
ZZZZZZ	1.00	1313																									
CRI	1.00	1320													X												
ICSA	1.00	1328													X												
ICSAB	1.00	1347													X												
CCV	1.00	1355													X												
CCB	1.00	1403													X												

COMPUCHEM a division of Liberty Analytical Corp. LOGBOOK 1 O(6) 4

Trace ICP Runlog (P4)

Part (A) of a two part form

Page 1 of 4

Method (Circle one.):

CLP ILM04.0

SW-846 6010B

MCAWW 200.7

Case: _____ Date: 07-19-01

R2141 ~~U2105~~ 7/20/01 CL

~~Q2151~~ 7/20/01 CL ~~QH2027~~ 7/20/01 CL

S2151 7/19/01 ~~R2140~~ ~~R2125~~ 7/20/01 CL

~~QH2027~~ 7/20/01 CL R2151 QH2027

Operator: Christie Layden

File name: P4CL0719

WSL NAME N/A

No.	Sample ID	Comments	Action needed	No.	Sample ID	Comments	Action Needed
	S0	Blank			CCV-2		
	S	XCL-11			CCB-2		
	S	STD3		1	R2141-5		
	S	XCL-2		2	-6		
	S	XCL-3A		3	-7		
	S	PLSBR		4	-8		
	ICV1			5	-9		
	SPEXASSE			6	-10		
	ICV3			7	↓ -11		
	ICB			8	CRI-2		
	LRS			9	ICSA-2		
	CRI-1			10	ICSA-2		
	ICSA-1				CCV-3		
	ICSAB-1				CCB-3		
	CCV-1			1	R2141-12		
	CCB-1			2	-13		
1	WG11381-4	PAS	(R2141)	3	↓ -14		
2	↓ -3	LCSS		4	WG11627-5	PAW Pb↓	REFUN (Q2151)
3	R2141-1	orig 5 M 7/18/01		5	↓ -4	LCSW SET	
4	WG11381-1	S		6	Q2151-1	orig.	
5	↓ -2	D		7	WG11627-1	S	
6	R2141-1	SDI 1:5		8	-2	SD	
7	↓	PAS All @ 2x NEEDS POS for Pb 130xmc		9	↓ -3	D	
8	R2141-2			10	Q2151-1	SDI 1:5	
9	-3				CCV-4		
10	↓ -4				CCB-4		

COMMENTS

Reviewed By: [signature]

Date: 07-19-01

The presence of the Chemist's employee ID number, or signature, on this run log attests that strict compliance with the method's SOP has occurred. Any SOP deviations require documentation by the responsible chemist together with the chemist's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation.

COMPUCHEM a division of Liberty Analytical Corp. LOGBOOK 1 O(6) 4

Trace ICP Runlog (P4)

Part (B) of a two part form

Method (Circle one.):
CLP ILM04.0
SW-846 6010B
MCAWW 200.7

Case: SAME
Date: 07-19-01
Operator: SAME
File name: ↓
WSL.NAME ↓

No.	Sample ID	Comments	Action needed	No.	Sample ID	Comments	Action Needed
1	Q2151-1	PBS All @ 2XCRDL		1	S2151-5		
2	Q2151-2			2	↓ -6		
3	↓ -3			3	WG11674-2	PBS (SOLL)	(QH2027)
4	-4			4	↓ -1	LCSS	
5	-5			5	↓ -1	LCSW	
6	↓ -6			6	7/19/01 ~~QH2027-1~~	CCV-7	
7	WG11626-5	PBS	(S2151)	7	7/19/01 ~~QH2027-2~~	CCB-7	7/19/01
8	ARI-3			8	WG11674-2	PBS (Req)	(QH2027)
9	ICSA-3			9	↓ -1	LCSS	
10	ICSAB-3			10	↓ -1	LCSW	
	CCV-5				CCV-7		
	CCB-5				CCB-7		
1	~~WG11626-4~~	LCSS		1	CCV-7		
2	S2151-1	orig		2	CCB-7		
3	WG11626-1	S		3	QH2027-1 QH2027-2		
4	↓ -2	SD		4	WG11674-2 ↓ -1	PBS (Req) LCSS	(QH2027)
5	↓ -3	D		5	↓ -2	LCSW	
6	S2151-1	SDI 1:5		6	QH2027-1		
7	↓	PDS All @ 2XCRDL		7	QH2027-2		MP 7/23/01
8	S2151-2			8	WG11642-2	PBW	(U2105)
9	↓ -3			9	↓ -1	LCSW	
10	↓ -4	MP 7/23/01		10	U2105-2		
	CCV-6				CCV-8		
	CCB-6				CCB-8		

COMMENTS

Reviewed By: Jean Tan

Date: 07-19-01

The presence of the Chemist's employee ID number, or signature, on this run log attests that strict compliance with the method's SOP has occurred. Any SOP deviations require documentation by the responsible chemist together with the chemist's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation.

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TANDARDS and REAGENTS TRACEABILITY Date: 07-19-01

HNO3 [Baker Instra-analyzed Trace-Metals grade,	Ref#*:	1M2- 164-10
HCl [Baker Instra-analyzed Trace-Metals grade,	Ref#:	1M2- 163-16
XCL-11 multi-element standard mix	Ref#:	7M1- 13-13
XCL-2 multi-element standard mix	Ref#:	7M1- 13-14
XCL-3A multi-element standard mix	Ref#:	7M1- 15-8
ICV1 multi-element standard mix	Ref#:	7M1- 15-28
ICV2 multi-element standard mix	Ref#:	7M1- 16-1
ICV3 multi-element standard mix	Ref#:	7M1- 16-2
ICV4 multi-element standard mix	Ref#:	7M1- 16-3
ICSA multi-element standard mix	Ref#:	7M1- 16-23
ICSAB multi-element standard mix	Ref#:	7M1- 17-10
LRS-1 multi-element standard mix	Ref#:	7M1- 9-28
LRS-2 multi-element standard mix	Ref#:	7M1- 10-1
Spex multi-element standard mix	Ref#:	7M1- 12-3
COM Lab mix 5	Ref#:	7M1- 15-14
CRDL-1 multi-element standard mix	Ref#:	7M1- 14-21
ANTIMONY (Sb) 1,000 PPM single-element standard	Ref#:	7M1- 16-10
BISMUTH (Bi) 1,000 PPM single-element standard	Ref#:	7M1- 15-9
TITANIUM (Ti) 1,000 PPM single-element standard	Ref#:	7M1- 15-10
TIN (Sn) 1,000 PPM single-element standard	Ref#:	7M1- 14-19
IRON (Fe) 10,000 PPM single-element standard	Ref#:	7M1- 11-1
ALUMINUM (Al) 1,000 PPM single-element standard	Ref#:	7M1- 17-6
CALCIUM (Ca) 10,000 PPM single-element standard	Ref#:	7M1- 16-12
MAGNESIUM (Mg) 10,000 PPM single-element standard	Ref#:	7M1- 17-9
MOLYBDENUM (Mo) 1,000 PPM single-element standard	Ref#:	7M1- 16-17
ARSENIC (As) 1, 000 PPM single-element standard	Ref#:	7M1- 11-4

The following standard solutions are applicable only when dissolved samples are analyzed.

XCL-LCS multi-element standard mix Ref#: N/A
XCL-20 multi-element standard mix Ref#: N/A

Reviewed By: [signature]
Date: 07-19-01

The following spaces are provided for non-CLP metals standards not previously identified.

N/A ml of N/A 1,000 PPM standard Ref#: N/A
N/A ml of N/A 1,000 PPM standard Ref# N/A

*Ref# = Logbook ID, Page number and item number. from Materials Receipt Log

ındards/QC Preparation for Trace ICP (P4)

ndard Lot Number	Preparation Instructions
CB/CCB- 071901-CL	Place in a 500-ml volumetric flask: 100 ml of deionized water 75 ml concentrated HNO_3, and 25 ml concentrated HCl. Bring up to volume with deionized water. Prepare weekly.
-11- 071801-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3, and 5 ml concentrated HCl. Pipet 0.2 ml XCL-11 into flask. Bring up to volume with deionized water. Prepare weekly.
L-2- 071001-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3, and 5 ml concentrated HCl. Pipet 0.2 ml of XCL-2 into flask. Bring up to volume with deionized water. Prepare weekly.
L-3A- 071101-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3, and 5 ml concentrated HCl. Pipet 1.0 ml of XCL-3A into flask. Bring up to volume with deionized water. Prepare weekly.
SB2-2X- 071001-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml of concentrated HNO_3, and 5 ml concentrated HCl. Pipet 0.2 ml of Sn, Bi, Ti, Sb, N/A, N/A, into flask. Bring up to volume with deionized water. Prepare weekly.
D3- 071001-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3 5 ml concentrated HCl 1.0 ml of 1,000-ppm Al, 0.5 ml of 10,000-ppm Fe, 1.0 ml of 10,000-ppm Mg 1.0 ml of 10,000-ppm Ca, Bring up to volume with deionized water. Prepare weekly.
VS1- 071801-CL	Place in a 500-ml volumetric flask: 400 ml of deionized water 75 ml concentrated HNO_3 25 ml of concentrated HCl 0.5ml of Sb, 0.5 ml of Sn, 0.5 ml of Bi, 0.5 ml of Ti, 2.5 mL Ca. Mg. 0.5 ml of Al, 0.5 ml of Fe 0.500 ml of XCL-2. 0.500 ml of XCL-11, 2.5 ml of XCL-3A Bring to volume with deionized water. Prepare weekly.

*Standard Lot Number consists of standard ID, date prepared, and initials of preparer.

Reviewed By: Jean Tam Date: 07-19-01

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4/27/01:mlj

andards/QC Preparation for Trace ICP (P4) CompuChem a division of Liberty Analytical Corp. LOGBOOK 1 P(6) 7

ndard Lot Number	Preparation Instructions
I-071001-LL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml of concentrated HNO_3 10 ml concentrated HCl, Pipet 20.0 ml of ICV1 into flask. Bring up to volume with deionized water. Prepare as needed.
13-071001-LL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated. HNO_3 10 ml concentrated HCl Pipet:20.0 ml of ICV3, 20.0 ml of ICV2, and 20.0 ml of ICV4 into flask. Bring to volume with deionized water. Prepare as needed.
EXAS-071001-LL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet 0.2 ml of CompuChem SPEX into flask. Bring up to volume with deionized water. Prepare as needed.
SA-071801-LL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet 20.0 ml ICSA into flask. Bring up to volume with deionized water. Prepare as needed.
SAB-071801-LL	Place in a 200-ml volumetric flask: 50 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet 20.0 ml ICSA and 20.0 ml ICSB into flask. Pipet: 0.2 ml Bi standard 0.2 ml Sn standard 0.2 ml Ti standard 0.2 ml Mo standard into flask. Bring up to volume with deionized water. Prepare as needed.
RS-071001-LL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3 and 5 ml concentrated HCl Pipet 0.10 ml LRS-1 and 0.10 ml LRS-2 into flask. Prepare as needed.

Standard Lot Number consists of standard ID, date prepared, and initials of preparer.

Reviewed By: Jean Tam Date: 07-19-01

andard Lot Number*	Preparation Instructions
RI- 071001-LL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet: 0.20 CRDL-1 into flask. 0.008 ml Bi into flask. 0.008 ml Sn into flask. 0.004 ml Mo into flask. 0.012 ml Ti into flask. N/A ml N/A 1000 standard into flask. N/A ml N/A 1000 standard into flask. N/A ml N/A 1000 standard into flask. Bring up to volume with deionized water. Prepare as needed.
nternal Standard- 071601-LL	Place in a 2000-ml volumetric flask: 1000 ml of deionized water 20 ml of concentrated HNO_3 Pipet: 10 mL of COM LAB MIX #5 internal standard. Bring up to volume with DI water. Prepare as needed. Yttrium, introduced into the sample stream yielding a final concentration in the plasma of 1 ppm, is used as an internal standard. Cesium, introduced into the sample stream yielding a final concentration in the plasma of 50ppm, is used as a reducing agent.
As- 071301-LL	Place 100 ml volumetric flask 50 ml DI water 1 ml concentrated HNO_3 0.1 ml 1000 ppm As Bring to volume. Prepare as needed.

	Prepared By	Date Prepared	Preparation Instructions
Dissolved Metals only: LCS	N/A	N/A	Add 1.0 ml of XCL-LCS solution to 9.0 ml of acidified water N/A ml HNO_3 + N/A ml HCl .
Prep Blank	↓	↓	Use acidified water (1% HNO_3 + 5% HCl N/A ml HNO_3 + N/A ml HCl
Sample Spike	↓	↓	Add 0.1 ml of XCL-20 to 10.0 ml of sample.

*Standard Lot Number consists of standard ID, date prepared, and initials of preparer.

Reviewed by: Jean Tam Date: 07-19-01

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COMPUCHEM a division of Liberty Analytical Corp. LOGBOOK 1 O(6) 4

Trace ICP Runlog (P4)

Part (A) of a two part form

Page 1 of 1

Method (Circle one.):
CLP ILM04.0
SW-846 6010B
MCAWW 200.7

Case: _____

Date: 07-23-01

R2141

Q2142

Operator: Christie Layden

File name: P4CL0723

WSL NAME N/A

No.	Sample ID	Comments	Action needed	No.	Sample ID	Comments	Action Needed
	S0	Blank			CCV-2		
	S	XCL-11			CCB -2		
	S	STD3		1			
	S	XCL-2		2			
	S	XCL-3A		3			
	S	PLSBR		4			
	ICV1			5			
	SPEXASSE			6			
	ICV3			7			
	ICB			8			
	LRS			9			
	CRI -1			10			
	ICSA -1				CCV		
	ICSAB -1				CCB		
	CCV -1			1			
	CCB -1			2			
1	R2141-1	SDI 1:5	(R2141)	3			
2	WG11417-1	LCSW	(Q2142)	4			
3	CRI-2			5			
4	ICSA-2			6			
5	ICSAB-2			7			
6				8			
7				9			
8				10			
9					CCV		
10					CCB		

CZ 7/23/01

CZ 7/23/01

COMMENTS

Reviewed By: _____

Date: 7-23-01

The presence of the Chemist's employee ID number, or signature, on this run log attests that strict compliance with the method's SOP has occurred. Any SOP deviations require documentation by the responsible chemist together with the chemist's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation.

1/29/01:mlj

STANDARDS and REAGENTS TRACEABILITY

Date: 07-23-01

HNO3 [Baker Instra-analyzed Trace-Metals grade,	Ref#*:	1M2- 164-10
HCl [Baker Instra-analyzed Trace-Metals grade,	Ref#:	1M2- 163-16
XCL-11 multi-element standard mix	Ref#:	7M1- 13-13
XCL-2 multi-element standard mix	Ref#:	7M1- 13-14
XCL-3A multi-element standard mix	Ref#:	7M1- 15-8
ICV1 multi-element standard mix	Ref#:	7M1- 16-24
ICV2 multi-element standard mix	Ref#:	7M1- 16-1
ICV3 multi-element standard mix	Ref#:	7M1- 16-2
ICV4 multi-element standard mix	Ref#:	7M1- 16-3
ICSA multi-element standard mix	Ref#:	7M1- 16-23
ICSAB multi-element standard mix	Ref#:	7M1- 17-10
LRS-1 multi-element standard mix	Ref#:	7M1- 9-28
LRS-2 multi-element standard mix	Ref#:	7M1- 10-1
Spex multi-element standard mix	Ref#:	7M1- 12-3
COM Lab mix 5	Ref#:	7M1- 15-14
CRDL-1 multi-element standard mix	Ref#:	7M1- 14-21
ANTIMONY (Sb) 1,000 PPM single-element standard	Ref#:	7M1- 16-10
BISMUTH (Bi) 1,000 PPM single-element standard	Ref#:	7M1- 15-9
TITANIUM (Ti) 1,000 PPM single-element standard	Ref#:	7M1- 15-10
TIN (Sn) 1,000 PPM single-element standard	Ref#:	7M1- 14-19
IRON (Fe) 10,000 PPM single-element standard	Ref#:	7M1- 11-1
ALUMINUM (Al) 1,000 PPM single-element standard	Ref#:	7M1- 17-6
CALCIUM (Ca) 10,000 PPM single-element standard	Ref#:	7M1- 16-12
MAGNESIUM (Mg) 10,000 PPM single-element standard	Ref#:	7M1- 17-9
MOLYBDENUM (Mo) 1,000 PPM single-element standard	Ref#:	7M1- 16-17
ARSENIC (As) 1, 000 PPM single-element standard	Ref#:	7M1- 11-4

The following standard solutions are applicable only when dissolved samples are analyzed.

XCL-LCS multi-element standard mix	Ref#:	7/23/01 ~~N/A~~ EL 7M1-16-21 7M1-16-22
XCL-20 multi-element standard mix	Ref#:	N/A

Reviewed By: [signature]

Date: 7-23-01

The following spaces are provided for non-CLP metals standards not previously identified.

N/A ml of N/A 1,000 PPM standard Ref#: N/A

N/A ml of N/A 1,000 PPM standard Ref# N/A

*Ref# = Logbook ID, Page number and Item number. from Materials Receipt Log

Standards/QC Preparation for Trace ICP (P4)

Standard Lot Number	Preparation Instructions
SO/ICB/CCB-072001-CL	Place in a 500-ml volumetric flask: 100 ml of deionized water 75 ml concentrated HNO_3, and 25 ml concentrated HCl. Bring up to volume with deionized water. Prepare weekly.
XCL-11-071801-CL 7/23/01 15	Place in a 100-ml volumetric flask: 50 ml of deionized water 20 ml concentrated HNO_3, and 5 ml concentrated HCl. Pipet 0.2 ml XCL-11 into flask. Bring up to volume with deionized water. Prepare weekly.
XCL-2-072301-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3, and 5 ml concentrated HCl. Pipet 0.2 ml of XCL-2 into flask. Bring up to volume with deionized water. Prepare weekly.
XCL-3A-072301-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3, and 5 ml concentrated HCl. Pipet 1.0 ml of XCL-3A into flask. Bring up to volume with deionized water. Prepare weekly.
PLSB2-2X-072301-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml of concentrated HNO_3, and 5 ml concentrated HCl. Pipet 0.2 ml of Sn, Bi, Ti, Sb, N/A, N/A, into flask. Bring up to volume with deionized water. Prepare weekly.
STD3-072301-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3 5 ml concentrated HCl 1.0 ml of 1,000-ppm Al, 0.5 ml of 10,000-ppm Fe, 1.0 ml of 10,000-ppm Mg 1.0 ml of 10,000-ppm Ca, Bring up to volume with deionized water. Prepare weekly.
CVS1-071801-CL	Place in a 500-ml volumetric flask: 400 ml of deionized water 75 ml concentrated HNO_3 25 ml of concentrated HCl 0.5ml of Sb, 0.5 ml of Sn, 0.5 ml of Bi, 0.5 ml of Ti, 2.5 mL Ca. Mg. 0.5 ml of Al, 0.5 ml of Fe 0.500 ml of XCL-2. 0.500 ml of XCL-11, 2.5 ml of XCL-3A Bring to volume with deionized water. Prepare weekly.

*Standard Lot Number consists of standard ID, date prepared, and initials of preparer.

Reviewed By: _____ Date: 7-23-01

4/27/01:mlj

Standard Lot Number*	Preparation Instructions
ICV1- 072001-CL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml of concentrated HNO_3 10 ml concentrated HCl, Pipet 20.0 ml of ICV1 into flask. Bring up to volume with deionized water. Prepare as needed.
ICV3- 072001-CL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated. HNO_3 10 ml concentrated HCl Pipet:20.0 ml of ICV3, 20.0 ml of ICV2, and 20.0 ml of ICV4 into flask. Bring to volume with deionized water. Prepare as needed.
SPEXAS- 072301-CL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet 0.2 ml of CompuChem SPEX into flask. Bring up to volume with deionized water. Prepare as needed.
ICSA- 071801-CL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet 20.0 ml ICSA into flask. Bring up to volume with deionized water. Prepare as needed.
ICSAB- 071801-CL	Place in a 200-ml volumetric flask: 50 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet 20.0 ml ICSA and 20.0 ml ICSB into flask. Pipet: 0.2 ml Bi standard 0.2 ml Sn standard 0.2 ml Ti standard 0.2 ml Mo standard into flask. Bring up to volume with deionized water. Prepare as needed.
LRS- 072301-CL	Place in a 100-ml volumetric flask: 50 ml of deionized water 15 ml concentrated HNO_3 and 5 ml concentrated HCl Pipet 0.10 ml LRS-1 and 0.10 ml LRS-2 into flask. Prepare as needed.

*Standard Lot Number consists of standard ID, date prepared, and initials of preparer.

Reviewed By: [signature] Date: 7-23-01

Standards/QC Preparation for Trace ICP (P4)

 CompuChem a division of Liberty Analytical Corp. LOGBOOK 1 P(6) 7

Standard Lot Number*	Preparation Instructions
CRI - 072001-CL	Place in a 200-ml volumetric flask: 100 ml of deionized water 30 ml concentrated HNO_3 10 ml concentrated HCl Pipet: 0.20 CRDL-1 into flask. 0.008 ml Bi into flask. 0.008 ml Sn into flask. 0.004 ml Mo into flask. 0.012 ml Ti into flask. N/A ml N/A 1000 standard into flask. N/A ml N/A 1000 standard into flask. N/A ml N/A 1000 standard into flask. Bring up to volume with deionized water. Prepare as needed.
Internal Standard- 072001-CL	Place in a 2000-ml volumetric flask: 1000 ml of deionized water 20 ml of concentrated HNO_3 Pipet: 10 mL of COM LAB MIX #5 internal standard. Bring up to volume with DI water. Prepare as needed. Yttrium, introduced into the sample stream yielding a final concentration in the plasma of 1 ppm, is used as an internal standard. Cesium, introduced into the sample stream yielding a final concentration in the plasma of 50ppm, is used as a reducing agent.
As- 072301-CL	Place 100 ml volumetric flask 50 ml DI water 1 ml concentrated HNO_3 0.1 ml 1000 ppm As Bring to volume. Prepare as needed.

	Prepared By	Date Prepared	Preparation Instructions
Dissolved Metals only: LCS	CZ	7/23/01	Add 1.0 ml of XCL-LCS solution to 9.0 ml of acidified water 15 ml HNO_3 + 5 ml HCl .
Prep Blank	N/A	N/A	Use acidified water (1% HNO_3 + 5% HCl N/A ml HNO_3 + N/A ml HCl
Sample Spike	↓	↓	Add 0.1 ml of XCL-20 to 10.0 ml of sample.

*Standard Lot Number consists of standard ID, date prepared, and initials of preparer.

Reviewed by: [signature] Date: 7-23-01

Metals/Mercury Preparation Log

CompuChem a division of Liberty Analytical Corp.

Metals Method (circle one): CLP(ILM04.0/ILM04.1) 200.7 3010A 3020A 3050B 3005A Sample Prep Included 3030C

Mercury Method (circle one): MCAWW: 245.1 245.5 ILM04.0/ILM04.1 245.1-M 245.5-M SW846: 7470A 7471A

Case/SDG: Q2141 / R2141 Prepared by: M. Cuyler Date: 07-13-01 PREP LOG GENERATED ON: 07/09/01

#	CCN (Lab ID)	Client ID	Date Rec'd	ICAP Initial mL (g)	ICAP Final (mL)	HG Initial mL g	HG Final (mL)	Description Before	Description After (ICAP)	Description After (HG)	pH
1	R2141-1	SR-11	7/6/01	.00	200	N/A	N/A	brown coarse	yellow clear	N/A	N/A
2	R2141-10	SR-20	7/6/01	.04				brown coarse	yellow clear		
3	R2141-11	SR-21	7/6/01	.07				brown med	yellow clear		
4	R2141-12	DUPLICATE2	7/6/01	.08				brown coarse	yellow clear		
5	R2141-13	SR-9	7/6/01	.00				brown med	yellow clear		
6	R2141-14	SR-10	7/6/01	.05				brown med	yellow clear		
7	R2141-2	SR-12	7/6/01	.03				brown coarse	yellow clear		
8	R2141-3	SR-13	7/6/01	.02				brown coarse	yellow clear		
9	R2141-4	SR-14	7/6/01	.01				brown coarse	yellow clear		
10	R2141-5	SR-15	7/6/01	.02				brown coarse	yellow clear		
11	R2141-6	SR-16	7/6/01	.00				brown coarse	yellow clear		
12	R2141-7	SR-17	7/6/01	.02				brown coarse	yellow clear		
13	R2141-8	SR-18	7/6/01	.03				brown coarse	yellow clear		
14	R2141-9	SR-19	7/6/01	.04				brown med	yellow clear		
15											
16											
17											
18											
19											
20											
21	Sample Spike : WG11381-1			1.00	200	N/A	N/A	Ref CCN # : (R2141-1)			
22	Sample Spike Dup. : N/A			N/A	N/A			Ref CCN # : (N/A)			
23	Duplicate Sample : WG11381-2			1.00	200			Ref CCN # : (R2141-1)			
24	Lab Control Sample : WG11381-3			1.00				Reviewed by: [signature]			
25	Prep Blank : WG11381-4			1.00				Date: 07-16-01			

MCC 07-13-01

Reagent Manufacturer & Lot #'s:
HNO3: N1055 (1M2164-10) H2O2: 011501 (1M2164-5)
HCL: N0334 (1M2163-16)

Time Hg in water bath:	N/A
Time Hg out water bath:	N/A
water bath temp:	N/A
Hot block temp :	95

Sample Spike(SS) Ref:
ICAP: 2.0 ml XCL-20 7ml-17-13
HG: N/A

LCS Ref:
ICAP: 1.0g ea PPT 7ml-17-13
HG: N/A

NOTE: All standards and QC for mercury were prepared at the same time as the associated samples.
Refer to the attached Standard Preparation Logbook, with date matching the above preparation date, for preparation method and instruction.

CompuChem Environmental Corp.

Inorganic Dry Weight/Duplicate Dry Weight Worksheet

page 1 of ____

Analyst: M. Campbell

Data Entered in LIMS by: _____ Date: 07-13-01

Dish #	Sample ID (CCN)	Client ID	Container Weight	Container and Sample Wet Weight	Container and Sample Dry Weight (A)
1	R2421-1 Dup		1.26	8.66	7.71
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

		Time In		Time Out
A	Date: 07-13-01	1:52	Date: 07-14-01	8:17
B	Date:		Date:	
C	Date:		Date:	
D	Date:		Date:	
	Date:		Date:	

See next page for additional weighings if necessary

Analysis Report 07/19/01 05:30:10 PM page 1

Method: CLP5A-P4 Sample Name: R2141-2 Operator:
Run Time: 07/19/01 17:22:39
Comment: SDG:R2141 ClientID:SR-12 1:1
Mode: CONC Corr. Factor: 1

High level of Fe - Flag
Pb result "J" L

Elem	Ag3280	Al3082	Ba4934	Be3130	Ca3179	Cd2265	Co2286
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	-2.20139	83768.66	1322.017	2.309043	28082.98	1.725421	60.62901
SDev	.59418	24.04	1.506	.044230	83.91	.071435	.48691
%RSD	26.99095	.0286954	.1139121	1.915534	.2987982	4.140122	.8030997
#1	-1.55577	83755.81	1321.377	2.346928	28112.85	1.643449	60.92694
#2	-2.72526	83796.40	1323.737	2.260438	28147.87	1.758447	60.89297
#3	-2.32314	83753.79	1320.937	2.319764	27988.22	1.774366	60.06712
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5000.000	620000.0	130000.0	5000.000	620000.0	30000.00	40000.00
Low	-10.0000	-200.000	-200.000	-5.00000	-5000.00	-5.00000	-50.0000

Elem	Cr2677	Cu3247	Fe2714	K 7664	Mg2790	Mn2576	Na3302
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	149.2283	264.5906	144090.5	45611.30	49821.99	1936.797	-1567.67
SDev	.0942	25.1173	337.3	62.90	160.42	4.604	56.84
%RSD	.0631335	9.492891	.2340868	.1379141	.3219937	.2376908	3.625789
#1	149.1211	241.6736	144144.9	45590.66	49869.19	1937.138	-1528.77
#2	149.2979	260.6548	144397.4	45681.93	49953.51	1941.220	-1541.35
#3	149.2657	291.4435	143729.4	45561.31	49643.26	1932.032	-1632.90
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	40000.00	40000.00	400000.0	400000.0	620000.0	20000.00	500000.0
Low	-10.0000	-25.0000	-100.000	-5000.00	-5000.00	-15.0000	-5000.00

Elem	Ni2316	Tl1908	V 2924	Zn2062	Pb2203	Se1960	Sb2068
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	85.26732	34.41826	290.8978	287.9537	17.91489	.2860603	-18.5635
SDev	.71864	.50265	.5645	.9084	.52078	2.172041	1.2723
%RSD	.8428095	1.460423	.1940456	.3154707	2.906956	759.2946	6.853745
#1	85.32667	34.77362	291.3271	288.3740	18.45189	-1.24161	-17.9377
#2	85.95445	33.84315	291.1079	288.5759	17.88188	-.672723	-20.0275
#3	84.52084	34.63799	290.2584	286.9113	17.41140	2.772517	-17.7253
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	50000.00	40000.00	40000.00	20000.00	40000.00	50000.00	10000.00
Low	-40.0000	-10.0000	-50.0000	-10.0000	-3.00000	-5.00000	-60.0000

Elem	As1890	22031	22032	19601	19602	Sn1899	Bi2230
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	12.44715	22.69909	15.52254	7.451261	-3.29424	23.57600	-3.32408
SDev	1.32839	1.49608	1.00807	1.816768	3.95287	1.14944	.84499
%RSD	10.67228	6.590903	6.494227	24.38202	119.9934	4.875483	25.42016
#1	12.80419	22.12527	16.61336	7.188821	-5.45358	23.67302	-2.34844
#2	10.97672	24.39713	14.62530	9.384976	-5.69711	24.67386	-3.80242
#3	13.56053	21.57487	15.32896	5.779985	1.267975	22.38112	-3.82139
Errors	LC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	LC Pass	LC Pass
High	30000.00					10000.00	10000.00
Low	-5.00000					-20.0000	-10.0000

Elem	Mo2020	Ti3349
Units	ug/L	ug/L
Avge	2.025932	H11492.94
SDev	.256109	21.19
%RSD	12.64152	.1843382
#1	1.935813	H11495.25
#2	1.827065	H11512.88
#3	2.314919	H11470.70
Errors	LC Pass	LC High
High	10000.00	10000.00
Low	-10.0000	-30.0000

Analysis Report 07/19/01 06:23:10 PM page 1

Method: CLP5A-P4 Sample Name: R2141-7 Operator:
Run Time: 07/19/01 18:15:39
Comment: SDG:R2141 ClientID:SR-17 1:1
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	Ba4934	Be3130	Ca3179	Cd2265	Co2286
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	-.585706	47364.56	402.4101	2.646646	45673.76	2.189481	41.11436
SDev	.171629	212.43	1.0546	.017080	97.26	.355778	.23377
%RSD	29.30290	.4485078	.2620828	.6453459	.2129358	16.24941	.5685728
#1	-.709882	47595.01	403.3499	2.659235	45780.50	2.440659	41.03168
#2	-.389858	47322.12	402.6109	2.653500	45650.61	1.782360	40.93316
#3	-.657378	47176.55	401.2694	2.627204	45590.17	2.345422	41.37822
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5000.000	620000.0	130000.0	5000.000	620000.0	30000.00	40000.00
Low	-10.0000	-200.000	-200.000	-5.00000	-5000.00	-5.00000	-50.0000

Elem	Cr2677	Cu3247	Fe2714	K 7664	Mg2790	Mn2576	Na3302
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	91.69300	124.6643	101722.2	10849.25	36366.17	1152.258	95.85892
SDev	.59221	3.4255	185.6	31.24	73.45	1.526	49.02272
%RSD	.6458570	2.747758	.1824544	.2879038	.2019636	.1324293	51.14048
#1	92.30323	128.5914	101915.0	10882.28	36443.94	1153.829	140.1484
#2	91.65514	122.2915	101706.7	10845.29	36356.57	1152.165	43.18457
#3	91.12064	123.1101	101544.8	10820.19	36297.99	1150.781	104.2438
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	40000.00	40000.00	400000.0	400000.0	620000.0	20000.00	500000.0
Low	-10.0000	-25.0000	-100.000	-5000.00	-5000.00	-15.0000	-5000.00

Elem	Ni2316	Tl1908	V 2924	Zn2062	Pb2203	Se1960	Sb2068
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	76.54186	8.298541	126.8362	447.5942	103.9983	7.646784	-8.50195
SDev	.43803	2.714755	.1553	.9490	.3824	1.771669	1.40357
%RSD	.5722808	32.71365	.1224442	.2120247	.3676659	23.16881	16.50884
#1	77.01045	9.255467	126.9351	448.6371	104.1869	7.395835	-8.58351
#2	76.14267	10.40525	126.6572	447.3639	103.5583	9.530547	-9.86297
#3	76.47246	5.234905	126.9163	446.7815	104.2497	6.013969	-7.05938
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	50000.00	40000.00	40000.00	20000.00	40000.00	50000.00	10000.00
Low	-40.0000	-10.0000	-50.0000	-10.0000	-3.00000	-5.00000	-60.0000

Elem	As1890	22031	22032	19601	19602	Sn1899	Bi2230
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	29.15196	103.7569	104.1149	17.03793	2.955121	16.74954	.2064053
SDev	.94686	.3694	.7568	3.18958	1.239051	1.41413	1.892892
%RSD	3.248028	.3560053	.7269238	18.72048	41.92895	8.442778	917.0750
#1	28.06068	103.5336	104.5092	15.49212	3.350639	17.80406	1.377221
#2	29.63932	104.1833	103.2424	20.70588	3.948128	17.30198	1.219413
#3	29.75586	103.5540	104.5932	14.91579	1.566597	15.14258	-1.97742
Errors	LC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	LC Pass	LC Pass
High	30000.00					10000.00	10000.00
Low	-5.00000					-20.0000	-10.0000

Elem	Mo2020	Ti3349
Units	ug/L	ug/L
Avge	3.661274	2520.699
SDev	.306284	5.513
%RSD	8.365496	.2186941
#1	3.935440	2525.543
#2	3.717669	2521.853
#3	3.330711	2514.701
Errors	LC Pass	LC Pass
High	10000.00	10000.00
Low	-10.0000	-30.0000

75x ICSA level

Analysis Report 07/19/01 07:39:02 PM page 1

Method: CLPSA-P4 Sample Name: R2141-12 Operator:
Run Time: 07/19/01 19:31:31
Comment: SDG:R2141 ClientID: DUPLICATE2 1:1
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	Ba4934	Be3130	Ca3179	Cd2265	Co2286
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	-.762671	64156.04	638.0278	2.649544	26840.84	3.043678	54.98201
SDev	.389085	382.71	1.4496	.031313	35.71	.040276	.21978
%RSD	51.01609	.5965282	.2272042	1.181825	.1330448	1.323275	.3997309
#1	-1.12997	64503.82	639.3182	2.613720	26819.85	3.066155	54.81100
#2	-.803088	64218.26	638.3059	2.671698	26882.07	2.997180	54.90514
#3	-.354955	63746.03	636.4592	2.663214	26820.60	3.067700	55.22990
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5000.000	620000.0	130000.0	5000.000	620000.0	30000.00	40000.00
Low	-10.0000	-200.000	-200.000	-5.00000	-5000.00	-5.00000	-50.0000

Elem	Cr2677	Cu3247	Fe2714	K 7664	Mg2790	Mn2576	Na3302
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	131.3309	153.0006	109446.9	17554.98	24909.08	1433.003	-124.890
SDev	.1904	3.6285	170.4	33.11	21.44	1.486	74.558
%RSD	.1450098	2.371529	.1556997	.1885867	.0860931	.1037281	59.69891
#1	131.5127	155.2590	109551.4	17575.05	24899.25	1433.753	-199.031
#2	131.3471	154.9275	109539.0	17573.12	24933.67	1433.965	-49.9227
#3	131.1329	148.8152	109250.2	17516.77	24894.31	1431.291	-125.715
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	40000.00	40000.00	400000.0	400000.0	620000.0	20000.00	500000.0
Low	-10.0000	-25.0000	-100.000	-5000.00	-5000.00	-15.0000	-5000.00

Elem	Ni2316	Tl1908	V 2924	Zn2062	Pb2203	Se1960	Sb2068
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	101.4502	15.28976	173.2063	391.7638	158.8373	7.931474	-9.40442
SDev	.4391	1.13380	.2207	.8584	.3131	1.715435	1.04863
%RSD	.4328224	7.415391	.1274251	.2191011	.1971163	21.62820	11.15039
#1	100.9865	14.55081	173.0586	391.5903	158.9246	8.896790	-10.5397
#2	101.8596	16.59516	173.4600	392.6957	159.0974	8.946762	-8.47219
#3	101.5045	14.72330	173.1002	391.0056	158.4898	5.950870	-9.20134
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	50000.00	40000.00	40000.00	20000.00	40000.00	50000.00	10000.00
Low	-40.0000	-10.0000	-50.0000	-10.0000	-3.00000	-5.00000	-60.0000

Elem	As1890	22031	22032	19601	19602	Sn1899	Bi2230
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	36.49527	155.8616	160.3183	17.57565	3.113530	18.34170	1.604390
SDev	1.02953	.4662	.6964	2.02117	1.579452	1.35475	2.064468
%RSD	2.821007	.2991433	.4343719	11.49980	50.72866	7.386153	128.6762
#1	35.34619	155.8777	160.4412	18.41303	4.142735	19.77163	.5196714
#2	37.33373	155.3875	160.9450	19.04355	3.902855	18.17612	3.985110
#3	36.80588	156.3196	159.5686	15.27037	1.295002	17.07735	.3083901
Errors	LC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	LC Pass	LC Pass
High	30000.00					10000.00	10000.00
Low	-5.00000					-20.0000	-10.0000

Elem	Mo2020	Ti3349
Units	ug/L	ug/L
Avge	4.014574	3448.274
SDev	.153344	7.226
%RSD	3.819672	.2095446
#1	3.947686	3454.343
#2	3.906036	3450.198
#3	4.189999	3440.281
Errors	LC Pass	LC Pass
High	10000.00	10000.00
Low	-10.0000	-30.0000

75+ IESA level

Analysis Report QC Standard 07/23/01 12:06:58 PM page 1

Method: CLP5A-P4 Sample Name: LRS Operator:
Run Time: 07/23/01 11:59:49
Comment: LRS
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	Ba4934	Be3130	Ca3179	Cd2265	Co2286
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	5.298992	99.01309	10.16566	5.015246	1021.427	5.022019	4.836258
SDev	.246221	1.98841	.03345	.022140	1.014	.227876	.248759
%RSD	4.646565	2.008229	.3290383	.4414603	.0992347	4.537531	5.143628
#1	5.485150	100.8175	10.16632	5.014082	1020.806	5.171692	4.658203
#2	5.392014	99.34044	10.13188	5.037945	1022.597	4.759764	4.730084
#3	5.019812	96.88133	10.19877	4.993710	1020.880	5.134602	5.120486
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	5.000000	100.0000	10.00000	5.000000	1000.000	5.000000	5.000000
Range	50.00000	50.00000	50.00000	50.00000	50.00000	50.00000	50.00000

Elem	Cr2677	Cu3247	Fe2714	K 7664	Mg2790	Mn2576	Na3302
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	5.441622	5.032398	98.42039	1167.952	993.0821	9.971167	1611.330
SDev	.107809	.490001	2.03270	7.648	2.8755	.108544	7.450
%RSD	1.981192	9.736937	2.065324	.6548186	.2895530	1.088578	.4623469
#1	5.529656	4.481125	98.03993	1159.391	991.2735	9.886984	1605.535
#2	5.473831	5.418374	96.60481	1170.356	991.5749	10.09367	1619.734
#3	5.321380	5.197697	100.6165	1174.109	996.3979	9.932841	1608.721
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	5.000000	5.000000	100.0000	1000.000	1000.000	10.00000	2000.000
Range	50.00000	50.00000	50.00000	50.00000	50.00000	50.00000	50.00000

Elem	Ni2316	Tl1908	V 2924	Zn2062	Pb2203	Se1960	Sb2068
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	6.327257	10.69325	20.11497	26.34173	2.778620	6.160793	10.81840
SDev	.298563	1.72633	.22135	.09037	1.146981	.898228	.95577
%RSD	4.718678	16.14409	1.100424	.3430521	41.27880	14.57975	8.834693
#1	6.626583	11.66211	20.07678	26.30072	2.264906	6.267275	11.87714
#2	6.325725	11.71753	20.35293	26.44533	4.092662	7.001034	10.01921
#3	6.029463	8.700115	19.91520	26.27914	1.978293	5.214069	10.55885
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	5.000000	10.00000	20.00000	20.00000	3.000000	5.000000	10.00000
Range	50.00000	50.00000	50.00000	50.00000	50.00000	50.00000	50.00000

Elem	As1890	22031	22032	19601	19602	Sn1899	Bi2230
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	10.33331	1.428162	3.448172	4.696665	6.888649	20.71280	52.26409
SDev	1.33883	1.688380	.890773	4.201297	1.689070	.82475	1.64733
%RSD	12.95648	118.2205	25.83319	89.45277	24.51962	3.981828	3.151933
#1	10.77576	.9134399	2.934958	1.113632	8.837121	20.22678	51.64526
#2	11.39491	3.313995	4.476747	9.320548	5.839906	20.24655	54.13122
#3	8.829253	.0570496	2.932810	3.655815	5.988920	21.66507	51.01579
Errors	QC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass	QC Pass
Value	10.00000					20.00000	50.00000
Range	50.00000					50.50000	50.50000

Elem	Mo2020	Ti3349
Units	ug/L	ug/L
Avge	5.112578	40.42011
SDev	.352166	.24843
%RSD	6.888229	.6146131
#1	5.227092	40.15245
#2	4.717408	40.64330
#3	5.393236	40.46458
Errors	QC Pass	QC Pass
Value	5.000000	40.00000
Range	50.50000	50.50000

True value = 3 µg/L

$\frac{2.778\ \mu g/L}{3.0\ \mu g/L} \cdot 100 = 92.67\%$ recovery

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Method: CLP5A-P4 Sample Name: SDIR2141-1 Operator:
Run Time: 07/19/01 17:07:32 Serial
Comment: SDG:R2141 ClientID:SR-11L 1:5 dilution
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	Ba4934	Be3130	Ca3179	Cd2265	Co2286
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	9.093101	10547.80	420.8008	9.859239	504.5652	9.612514	96.84403
SDev	.065199	51.56	.6510	.004843	.5063	.250872	.31367
%RSD	.7170106	.4888128	.1546951	.0491169	.1003450	2.609844	.3238966
#1	9.028681	10488.80	421.4745	9.861931	504.5448	9.869591	96.78474
#2	9.159051	10584.16	420.7528	9.853648	505.0815	9.599603	97.18311
#3	9.091574	10570.46	420.1752	9.862137	504.0695	9.368346	96.56422
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5000.000	620000.0	130000.0	5000.000	620000.0	30000.00	40000.00
Low	-10.0000	-200.000	-200.000	-5.00000	-5000.00	-5.00000	-50.0000

Elem	Cr2677	Cu3247	Fe2714	K 7664	Mg2790	Mn2576	Na3302
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	51.97781	61.59884	14473.04	589.0138	1132.354	181.8884	109.9513
SDev	.34345	1.43094	38.64	5.7216	2.644	.4803	108.3185
%RSD	.6607549	2.323001	.2669614	.9713844	.2334981	.2640675	98.51502
#1	52.19783	60.00490	14502.81	595.3537	1130.974	182.3941	122.7310
#2	52.15354	62.77279	14486.94	587.4534	1135.403	181.8326	-4.19022
#3	51.58205	62.01883	14429.38	584.2342	1130.687	181.4384	211.3130
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	40000.00	40000.00	400000.0	400000.0	620000.0	20000.00	500000.0
Low	-10.0000	-25.0000	-100.000	-5000.00	-5000.00	-15.0000	-5000.00

Elem	Ni2316	Tl1908	V 2924	Zn2062	Pb2203	Se1960	Sb2068
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	103.1131	11.73169	114.2481	131.5928	11.52139	4.824745	47.55034
SDev	1.2454	2.04668	.2859	.3156	.24137	1.309228	.37458
%RSD	1.207814	17.44574	.2502356	.2395460	2.094984	27.13570	.7877442
#1	103.2034	9.632459	114.5553	131.8837	11.69677	6.276135	47.50243
#2	104.3108	11.84120	114.1992	131.6369	11.62129	4.465354	47.94656
#3	101.8249	13.72142	113.9898	131.2579	11.24611	3.732745	47.20202
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	50000.00	40000.00	40000.00	20000.00	40000.00	50000.00	10000.00
Low	-40.0000	-10.0000	-50.0000	-10.0000	-3.00000	-5.00000	-60.0000

Elem	As1890	22031	22032	19601	19602	Sn1899	Bi2230
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Avge	11.65859	13.78589	10.38598	9.342394	2.566071	174.4324	182.8086
SDev	1.21713	.67291	.44179	3.380024	.725627	1.7789	1.0764
%RSD	10.43978	4.881142	4.253697	36.17942	28.27774	1.019806	.5887951
#1	11.17855	14.47538	10.30467	12.43860	3.196270	175.4920	181.5660
#2	13.04254	13.13089	10.86278	9.852122	1.772776	172.3786	183.4515
#3	10.75468	13.75140	9.990498	5.736456	2.729166	175.4265	183.4085
Errors	LC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	LC Pass	LC Pass
High	30000.00					10000.00	10000.00
Low	-5.00000					-20.0000	-10.0000

Elem	Mo2020	Ti3349
Units	ug/L	ug/L
Avge	179.8957	427.8849
SDev	.2813	.7176
%RSD	.1563754	.1677191
#1	180.2181	428.0005
#2	179.7004	428.5378
#3	179.7685	427.1165
Errors	LC Pass	LC Pass
High	10000.00	10000.00
Low	-10.0000	-30.0000

SECTION 5

SDG NARRATIVES AND

PROJECT CHAIN-OF-CUSTODY RECORDS

CompuChem

a division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE

SDG # R2141
CONTRACT # OLM04-REVS

SAMPLE IDENTIFICATIONS: DUPLICATE2, SR-10, SR-11, SR-12, SR-13, SR-14, SR-15, SR-16, SR-17, SR-18, SR-19, SR-20, SR-21, SR-9

The 14 soil samples listed above were received intact, properly refrigerated at 5°C, in sealed shipping containers, on July 6, 2001. Samples SR-9 and SR-10 were received but not listed on the Chain-of-Custodies (COCs). The client was contacted and directed CompuChem to proceed with analyses. All other documentation was complete. The samples were scheduled for the requested analyses of the semivolatile fractions. The samples were prepared and analyzed following the current EPA Contract Laboratory Program (CLP) Statement of Work (SOW), Document OLM04.2. The pH values of these soil samples ranged from 5.1 to 7.6, and the percent moistures ranged from 5 to 17. All pertinent Quality Assurance Notices are included in the narrative section, and all pertinent Laboratory Notices for SDG R2141 are included in the sample data sections.

Extraction and analysis holding time requirements were met for all of these samples.

There were several Project analytes identified above the Contract Required Quantitation Limit (CRQL) in 10 of these samples. Manual quantitations were performed on one or more of the process files associated with this SDG, including samples DUPLICATE2, SR-10, SR-11, SR-12, SR-13, SR-14, SR-15, SR-16, SR-17, SR-18, SR-19, SR-20, SR-21, and SR-9. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

In the initial undiluted analysis of SR-15, the on-column amounts of benzo(a)anthracene and benzo(b)fluoranthene exceeded the instrument's analytical range as defined by the highest concentration level of the Initial Calibration. The sample was reanalyzed at a 4x dilution in order to bring the on-column amounts into range. We have reported both analyses of SR-15.

In the initial undiluted analysis of SR-16, the on-column amount of benzo(b)fluoranthene exceeded the instrument's analytical range as defined by the highest concentration level of the Initial Calibration. The sample was reanalyzed at a 4x dilution in order to bring the on-column amount into range. We have reported both analyses of SR-16.

Due to the results of a screen of the sample, SR-20 was initially analyzed at a 12x dilution. The screen Reconstructed Ion Chromatogram (RIC) is included immediately behind the RIC of the reportable run. Due to the results of a screen of the sample, SR-10 was initially analyzed at a 2x dilution. The screen Reconstructed Ion Chromatogram (RIC) is included immediately behind the RIC of the reportable run. Due to the viscosity of the sample extract, DUPLICATE2 was initially analyzed at a 5x dilution.

All decafluorotriphenylphosphine (DFTPP) abundance criteria were met for tunes associated to this SDG. Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG. All of the surrogates met recovery criteria in the analyses of these samples. All of the internal standards met response and retention time criteria in the analyses of these samples. The associated method blank met all quality control criteria.

SR-11 was used as the original to prepare the duplicate matrix spikes. The associated duplicate matrix spikes met all advisory accuracy criteria. With one exception, the associated duplicate matrix spikes met all advisory precision criteria. The Relative Percent Difference (RPD) of pyrene was flagged as an outlier in the comparison of the duplicate matrix spikes. Do to the clients request, the matrix spike duplicates are not being reported, but can be found in the non-reportable's section of the data package.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Paul T. Frankson
Manager, GC/MS SVOA
July 23, 2001
Amended August 21, 2001

CompuChem
A Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

INORGANIC CASE SUMMARY NARRATIVE
SDG # R2141
PROTOCOL #ILM04.0

The indicated Sample Delivery Group (SDG) consisting of fourteen (14) soil samples was received into the laboratory management system (LIMS) on July 6, 2001 intact and in good condition with Chain of Custody (COC) records in order. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The samples were analyzed for lead using analytical methods delineated in ILM04.0.

SAMPLE IDs:

The cover page contained in this package lists the client ID's and the associated CompuChem numbers which are part of this SDG.

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV & CCV), blanks (ICB, CCB) and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within CLP allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSS & PBS) were found to be within acceptable ranges. All field samples were run within contract holding times.

CompuChem utilizes a soil Laboratory Control Samples (LCS) purchased from Environmental Resource Associates (ERA). With each lot of soil LCS material purchased, a certification document is included which provides Performance Acceptance Limits (PAL's). The limits are listed as guidelines for acceptable results and closely approximate the 95 % confidence interval. As with any LCS it is a QC measure used to demonstrate control and any results obtained which are outside the acceptance criteria require corrective action up to and including re-digesting and re-analyzing the entire sample preparation batch.

MATRIX RELATED QUALITY CONTROL:

The sample matrix spike WG11381-1 (SR-11S) was inside control limits for all requested analytes.

CLP control limits for matrix spike recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more; in this case effected analytes are not flagged even if recoveries fall outside percentage recovery control limits.

The sample matrix duplicate, WG11381-2 (SR-11D) was inside control limits for all requested analytes.

CLP control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the CRDL in both the original and duplicate samples, and

+/- the CRDL for concentrations less than five times the CRDL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, R2141-1 (SR-11L) was performed in accordance with CLP requirements for ICP analysis.

The adjusted sample concentrations were inside control limits for all requested analytes.

CLP control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution-adjusted concentrations from the original values for all analyte concentrations with values greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Mary K. Powell
Data Reviewer II
July 23, 2001

Note: This report is paginated for reference and accountability.

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COMPUCHEM
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 056984

Project Name: LPI	Client Address: 2755 BERGEY RD HATFIELD, PA 19440	Point-of-Contact: MIKE CHRISTIE
Carrier: FEDEX		Telephone No.: 215 997-9003
Airbill No.: 7916 0550 3475		Sampling complete? Y or N (see Note 1)
Sampler Name: SMG	Sampler Signature: Scott Gallagher	Project-specific (PS) or Batch (B) QC ?

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil / Sediment / Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other_____	A. HCl + Ice B. HNO3 + Ice C. NaOH + Ice D. H2SO4 + Ice E. Unpreserved F. Ice Only G. Other_____ H. NaHSO4 + Ice I. ZnAc+NaOH + Ice	F. Filtered U. Unfiltered	H. High M. Medium L. Low	C. CLP 3/90 T. TCLP S. SW-846 W. CWA 600-series O. Other_____

Sample ID (9 characters maximum)	Date:Year: 2001	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	LEAD	SEE NOTE		Remarks / Comments (see Notes 2 & 3)
SR-11	7/3	10:15	S	F	—	4	C	1											X	X		ANALYZE SAMPLES
SR-12	7/3	10:20	S	F	—	4	C	1											X	X		FOR THE FOLLOWING:
SR-13	7/3	14:15	S	F	—	4	C	1											X	X		BENZO(A) PYRENE
SR-14	7/3	14:18	S	F	—	4	C	1											X	X		BENZ(A) ANTHRACENE
SR-15	7/3	14:20	S	F	—	4	C	1											X	X		BENZO(B) FLUORANTHENE
SR-16	7/3	14:22	S	F	—	4	C	1											X	X		DIBENZO(A,H) ANTHRACENE
SR-17	7/3	14:25	S	F	—	4	C	1											X	X		INDENO(1,2,3-CD) PYRENE
SR-18	7/3	14:27	S	F	—	4	C	1											X	X		DIBENZO FURAN
SR-19	7/3	14:30	S	F	—	4	C	1											X	X		
SR-20	7/3	14:35	S	F	—	4	C	1											X	X		

Clients Special Instructions: Temperature 5 °C

Lab: Received In Good Condition? Y or N Describe Problems, If any: SAMPLES SR-9 & SR-10 RECEIVED BUT NOT LISTED ON THE CHAIN OF CUSTODY

#1 Relinquished By: (Sig) Scott Gallagher	#2 Relinquished By: (Sig)	#3 Relinquished By: (Sig)
Date: 7/3/01	Date:	Date:
Company Name: PENN PAL	Company Name:	Company Name:
Time: 1705	Time:	Time:
#1 Received By: (Sig) Courtney Fuller	#2 Received By: (Sig)	#3 Received By: (Sig)
Date: 7/6/01	Date:	Date:
Company Name: COMPUCHEM	Company Name:	Company Name:
Time: 8:55	Time:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; If "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

CompuChem
a division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513
1-800-833-5097

CHAIN-OF-CUSTODY RECORD

No. 056890

Project Name: UPT	Client Address: 2755 BERGEY RD HATFIELD, PA 19440	Point-of-Contact: MIKE CHRISTIE
Carrier: FEDEX		Telephone No.: 215 997-9100
Airbill No.: 7916 0550 5475		Sampling complete: Y or N (see Note 1)
Sampler Name: SMG	Sampler Signature: [signature]	Project-specific (PS) or Batch (B) QC ?

BOX #1	BOX #2	BOX #3	Box #4	Box #5
1. Surface Water	A. HCl + Ice	F. Filtered	H. High	C. CLP-3/91
2. Ground Water	B. HNO3 + Ice	U. Unfiltered	M. Medium	T. TCLP
3. Leachate	C. NaOH + Ice		L. Low	S. SW-846
4. Rinsate	D. H2SO4 + Ice			W. CWA 600-series
5. Soil / Sediment / Sludge	E. Unpreserved			O. Other
6. Trip Blank	F. Ice Only			
7. Oil	G. Other			
8. Waste	H. NaHSO4 + Ice			
9. Other	I. ZnAc+NaOH + Ice			

Sample ID (9 characters maximum)	Date:Year 2001	Time	Box #1 Matrix	Box #2 Preservative	Box #3 Filtered / Unfiltered	Box #4 Expected Conc.	Box #5 Method	No. of Bottles	Use for Lab QC (MS or DUP)	VOA	SVOC	Pesticide	PCB	Herbicide	Metals / Mercury	Cyanide	TOC / TOX	O&G / TPH	LEAD	SEE NOTE			Remarks / Comments (see Notes 2 & 3)
SR-21	7/3	14:38	S	F	—	L	C	1											X	X			ANALYZE SAMPLES
DUPLICATE2	7/3	14:35	S	F	—	L	C	1.											X	X			FOR THE FOLLOWING
	/	:																					BENZO(A) PYRENE
	/	:																					BENZ-(A) ANTHRACENE
	/	:																					BENZO(B) FLUORANTHENE
	/	:																					DIBENZO(A,H) ANTHRACENE
	/	:																					INDENO(1,2,3-CD) PYRENE
	/	:																					DIBENZO FURAN
	/	:																					
	/	:																					

Clients Special Instructions: Temperature 5 °C

Lab: Received in Good Condition? Y or N Describe Problems, if any:

#1 Relinquished By: (Sig) [signature]	Date: 7/3/01	#2 Relinquished By: (Sig)	Date:	#3 Relinquished By: (Sig)	Date:
Company Name: PENN EAC	Time: 1705	Company Name:	Time:	Company Name:	Time:
#1 Received By: (Sig) [signature]	Date: 7/6/01	#2 Received By: (Sig)	Date:	#3 Received By: (Sig)	Date:
Company Name: COMPUCHEM	Time: 9:45	Company Name:	Time:	Company Name:	Time:

Note (1): If "N" lab will hold samples to await remainder of project-maximizing batch size and minimizing QC ratio; If "Y" lab will begin processing batches now.
Note (2): Samples stored 60 days after date report mailed at no extra charge. Note (3): All lab copies of data destroyed after three years.

COMPUCHEM a Divison of Liberty Analytical
COMMERCIAL RECEIVING LOG

Client: PENN E&R	Rec'd Date: 7/6/01	PPS/RFA
Project: LPT	Courier: FEDEX	Lab Instructions
Quote: Q2141	Airbill No.	SVOAs by OLM04.2 (report LPT.sub), Pb by ILM04.0
Login No. R2141	7916055054 75	* Use Your QC
Subcontract? Y / N		
TAT Verbal Report B		

Cooler Rec'd By: Courtney Fuller	
Sample Login By: C. Scott	
Temperature: 5.6 °C	
Cyanide Samples checked for sulfide & chlorine? Y / NA	
Phenol Samples checked for chlorine? Y / NA	
Received in Good Condition? Y / N	
If no, explain:	

Parameters

CompuChem ID	Client ID	QC	Matrix	Date 20 01	Military Time	LEAD SVOAs No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
R2141-1	SR-11	*	SO	7/3	10:15	1-8oz-	NA														
-2	SR-12			/	10:20																
-3	SR-13			/	14:15																
-4	SR-14			/	14:18																
-5	SR-15			/	14:20																
-6	SR-16			/	14:22																
-7	SR-17			/	14:25																
-8	SR-18			/	14:27																
-9	SR-19			/	14:30																
-10	SR-20			/	14:35																
-11	SR-21			/	14:38																
-12	DUPLICATE2			/	14:35																
				/	:																
				/	:																
				/	:																
				/	:																
				/	:																
				/	:																
				/	:																
				/	:																

CS 7/6/1

CS 7/6/1

Container Type Abbreviations: 40mL(40mL vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER

rfl - 6/28/01:dce

COMPUCHEM a Divison of Liberty Analytical
COMMERCIAL RECEIVING LOG

52

Client: PENN E&P	Rec'd Date: 7/6/01	PPS/RFA
Project: L&T	Courier: FEDEX	Lab Instructions
Quote:	Airbill No. 791605505445	
Login No.		
Subcontract? Y / N		
TAT Verbal Report		

Cooler Rec'd By: [illegible]	
Sample Login By: [illegible]	
Temperature: 5°C	
Cyanide Samples checked for sulfide & chlorine? Y (NA)	
Phenol Samples checked for chlorine? Y / (NA)	
Received in Good Condition? (Y) / N	
If no, explain:	

Parameters

CompuChem ID	Client ID	QC	Matrix	Date 20 01	Military Time	No. & Type (LEAD SVOKS)	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
R2141-13	SR-9		SO	7/2	13:35	1-8oz.															
✓ -14	SR-10		↓	↓/↓	13:40	↓															
				/	:																
				/	:																
				/	:																
				/	:																
				/	:																
				/	:																
				/	:																
				/	:	7/6/1															
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				/	:																
				/	:																
				/	:																

Container Type Abbreviations: 40mL(40mL vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER _____ r11 - 6/28/01:dce

COMPUCHEM

Login Chain of Custody Report (ln01)

Jul. 06, 2001 05:52 PM

Login Number: R2141

Account: PENN — Penn Environmental & Remediation

Project: LPT

Case: Q2141

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
R2141-1	SR-11	03-JUL-01	06-JUL-01	9	19-JUL-01	*USE FOR QC*/PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil S %MOISTURE-UNDECA	Hold: 17-JUL-01					
Soil S METALS-ILM04.0	Hold: 31-JUL-01					
Soil S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar		1	Bottles	
R2141-2	SR-12	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil S %MOISTURE-UNDECA	Hold: 17-JUL-01					
Soil S METALS-ILM04.0	Hold: 31-JUL-01					
Soil S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar		1	Bottles	
R2141-3	SR-13	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil S %MOISTURE-UNDECA	Hold: 17-JUL-01					
Soil S METALS-ILM04.0	Hold: 31-JUL-01					
Soil S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar		1	Bottles	
R2141-4	SR-14	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil S %MOISTURE-UNDECA	Hold: 17-JUL-01					
Soil S METALS-ILM04.0	Hold: 31-JUL-01					
Soil S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar		1	Bottles	
R2141-5	SR-15	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil S %MOISTURE-UNDECA	Hold: 17-JUL-01					
Soil S METALS-ILM04.0	Hold: 31-JUL-01					
Soil S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar		1	Bottles	
R2141-6	SR-16	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil S %MOISTURE-UNDECA	Hold: 17-JUL-01					
Soil S METALS-ILM04.0	Hold: 31-JUL-01					
Soil S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar		1	Bottles	

Signature : C Stoll

Date : 7/6/1

COMPUCHEM

Login Chain of Custody Report (In01)

Jul. 06, 2001 05:52 PM

Login Number: R2141

Account: PENN — Penn Environmental & Remediation

Project: LPT

Q2141

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
R2141-7	SR-17	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	
R2141-8	SR-18	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	
R2141-9	SR-19	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	
R2141-10	SR-20	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	
R2141-11	SR-21	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	
R2141-12	DUPLICATE2	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	

Signature : C. Smith

Date : 7/6/1

COMPUCHEM

Login Chain of Custody Report (ln01)

Jul. 06, 2001 *06:52 PM*

Login Number: R2141

Account: PENN — Penn Environmental & Remediation

Project: LPT

Q2141

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date	Comments
R2141-13	SR-9	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	
R2141-14	SR-10	03-JUL-01	06-JUL-01	9	19-JUL-01	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
Soil	S %MOISTURE-UNDECA	Hold: 17-JUL-01				
Soil	S METALS-ILM04.0	Hold: 31-JUL-01				
Soil	S SVOA-LL-OLM04.2	Hold: 16-JUL-01	8oz jar	1	Bottles	

Signature : C Smith

Date : 7/6/1

COMPUCHEM

Work Group Report (wk02)

10-JUL-01 11:06 AM

Work Group: WG11422
Department: 310 ORGANIC EXTRACTIONS **Created:** 10-JUL-01

Sample	Client ID	Product	Matrix	RecvDate	Bottle#	Lab Information
R2141-1	SR-11	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-10	SR-20	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-11	SR-21	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-12	DUPLICATE2	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-13	SR-9	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-14	SR-10	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-2	SR-12	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-3	SR-13	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-4	SR-14	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-5	SR-15	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-6	SR-16	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-7	SR-17	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-8	SR-18	SVOA-LL-OLM04.2	Soil	06-JUL-01		
R2141-9	SR-19	SVOA-LL-OLM04.2	Soil	06-JUL-01		
WG11422-1	SBLKUO	SVOA-LL-OLM04.2	Soil	10-JUL-01		
WG11422-2	Matrix Spike	SVOA-LL-OLM04.2	Soil	10-JUL-01		
WG11422-3	Matrix Spike Duplica	SVOA-LL-OLM04.2	Soil	10-JUL-01		
WG11422-4	Matrix Spike	SVOA-LL-OLM04.2	Soil	10-JUL-01		
WG11422-5	Matrix Spike Duplica	SVOA-LL-OLM04.2	Soil	10-JUL-01		

Comments:

R2141-1	*USE FOR QC*/PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-10	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-11	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-12	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-13	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-14	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-2	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-3	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-4	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-5	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-6	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-7	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-8	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0
R2141-9	PPS768/SVOAs BY OLM04.2 (REPORT LPT.sub), Pb BY ILM04.0

EXTRACTS

Batch # 7-11-2

Internal Chain of Custody

Relinquished By	[signature]	Date 7/11/01	Received By	GCMS Retrig #2	Date 7/11/01	Reason	[signature]
Relinquished By	GCMS Retrig #2	Date 7/12/01	Received By	F. Nagle	Date 7/12/01	Reason	Analysis #66
Relinquished By	F. Nagle	Date 7/12/01	Received By	GCMS Retrig #2	Date 7/12/01	Reason	Temp Storage
Relinquished By	GCMS Retrig	Date 7/12	Received By	G. Mikulo	Date 7/12	Reason	Analysis
Relinquished By	G. Mikulo	Date 7/12	Received By	GCMS Retrig	Date 7/12	Reason	Temp Storage
Relinquished By	GCMS Retrig #2	Date 7/12/01	Received By	F. Nagle	Date 7/12/01	Reason	Analysis #66
Relinquished By	F. Nagle	Date 7/12/01	Received By	GCMS Retrig #2	Date 7/12/01	Reason	Temp Storage
Relinquished By		Date	Received By		Date	Reason	

FN 7/13/01

Internal Chain of Custody

RAW SAMPLE

Laboratory: Inorganics Requested By: M. Crupler

Water ____ Soil ✓ P.E. ____ Date: 07-13-01

EPA ____ Commercial ✓ Shift: 1 2 3

This form generated on: 7/9/01

	CCN	Receipt Date	Preservation	Analysis Parameter	Bottle Number (receiving use only)
1	R2141-1	7/6/01		METALS HG	1 of 1
2	R2141-10	7/6/01		METALS HG	of
3	R2141-11	7/6/01		METALS HG	of
4	R2141-12	7/6/01		METALS HG	of
5	R2141-13	7/6/01		METALS HG	of
6	R2141-14	7/6/01		METALS HG	of
7	R2141-2	7/6/01		METALS HG	of
8	R2141-3	7/6/01		METALS HG	of
9	R2141-4	7/6/01		METALS HG	of
10	R2141-5	7/6/01		METALS HG	of
11	R2141-6	7/6/01		METALS HG	of
12	R2141-7	7/6/01		METALS HG	of
13	R2141-8	7/6/01		METALS HG	of
14	R2141-9	7/6/01		METALS HG	of
15				METALS HG	of
16				METALS HG	of
17				METALS HG	of
18				METALS HG	of
19				METALS HG	of
20				METALS HG	of

Relinquished By: M. Crupler Date: 07-13-01 Received By: M. Crupler Date: 07-13-01

Relinquished By: M. Crupler Date: 07-13-01 Received By: S. Drage #1 Date: 07-13-01

Relinquished By: ____ Date: ____ Received By: ____ Date: ____

Internal Chain of Custody

ICP ANALYSIS

Project:_____

Case:_____ SDG:_____

Matrix:_____

COC for: raw sample extract digestates leachates aliquots other(explain):_____

CompuChem Numbers for Associated Samples

R2141-1	R2141-10	R2141-11	R2141-12	R2141-13	R2141-14
R2141-2	R2141-3	R2141-4	R2141-5	R2141-6	R2141-7
R2141-8	R2141-9				

Released by	Received by	Date	Reason
M. Carrupla	ICP Storage	07-13-01	Storage
ICP Storage	[illegible]	7/19/01	Analysis
[illegible]	ICP Storage	7/19/01	Storage
ICP Storage	[illegible]	7/23/01 7/23/01	Analysis
[illegible]	ICP Storage	7/23/01 7/23/01	Storage