

Thermo Nutech
W.O. No. N9-10-064-7232

RECEIVED
JAN 27 2000

Bechtel Hanford Inc.
SDG H0563

Case Narrative

EDMC

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0563 is composed of one liquid (water) sample designated under SAF No. B99-085 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU-QC Sa.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. Results were transmitted to BHI via facsimile on November 23, 1999

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.



TMA/RICHMOND

SAMPLE DELIVERY GROUP H0563

SAMPLE SUMMARY

SDG 7232
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BOWLM3	200 East B pond	WATER		N910064-01	B99-085	B99-085-5	10/06/99 06:45
Method Blank		WATER		N910064-03	B99-085		
Lab Control Sample		WATER		N910064-02	B99-085		
Duplicate (N910064-01)	200 East B pond	WATER		N910064-04	B99-085		10/06/99 06:45

SAMPLE SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/23/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0563

SDG 7232
 Contact Kevin C. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG H0563

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7232	B99-085-5	BOWLM3	WATER				10/11/99	5	N910064-01	7232-001
		Method Blank	WATER						N910064-03	7232-003
		Lab Control Sample	WATER						N910064-02	7232-002
		Duplicate (N910064-01)	WATER				10/11/99	5	N910064-04	7232-004

QC SUMMARY

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 11/23/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Gas Proportional Counting										
80A	WATER	Gross Alpha in Water	6904-080	20.0	1		1	1	1/1	
80B	WATER	Gross Beta in Water	6904-080	15.0	1		1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 11/23/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

WORK SUMMARY

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	SUF-							
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
BOWLM3		N910064-01	7232-001	80A/80		11/08/99	11/23/99	NJV	Gross Alpha in Water	
200 East B pond	WATER	10/06/99	7232-001	80B/80		11/08/99	11/23/99	NJV	Gross Beta in Water	
B99-085-5	B99-085	10/11/99								
Method Blank		N910064-03	7232-003	80A/80		11/08/99	11/23/99	NJV	Gross Alpha in Water	
	WATER		7232-003	80B/80		11/08/99	11/23/99	NJV	Gross Beta in Water	
	B99-085									
Lab Control Sample		N910064-02	7232-002	80A/80		11/08/99	11/23/99	NJV	Gross Alpha in Water	
	WATER		7232-002	80B/80		11/08/99	11/23/99	NJV	Gross Beta in Water	
	B99-085									
Duplicate (N910064-01)		N910064-04	7232-004	80A/80		11/08/99	11/23/99	NJV	Gross Alpha in Water	
200 East B pond	WATER	10/06/99	7232-004	80B/80		11/08/99	11/23/99	NJV	Gross Beta in Water	
	B99-085	10/11/99								

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
80A/80	B99-085	Gross Alpha in Water	EPA900.0	1			1	1	1		4
80B/80	B99-085	Gross Beta in Water	EPA900.0	1			1	1	1		4
TOTALS				2			2	2	2		8

WORK SUMMARY

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/23/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0563

N910064-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7232</u>	Client/Case no <u>Hanford</u>	<u>SDG H0563</u>
Contact <u>Kevin C. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N910064-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7232-002</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B99-085</u>	

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	73.0	5.2	0.91	3.0	80A	67.0	2.7	109	65-135	80-120
Gross Beta	85.2	3.9	2.3	4.0	80B	83.0	3.3	103	75-125	

200 Area Source ctzn-200-CW-1 OUQCSa

QC-LCS 32142

LAB CONTROL SAMPLES

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>11/23/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0563

N910064-04

BOWLM3

DUPLICATE

SDG <u>7232</u>	Client/Case no <u>Hanford</u>	SDG <u>H0563</u>
Contact <u>Kevin C. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N910064-04</u>	Lab sample id <u>N910064-01</u>	Client sample id <u>BOWLM3</u>
Dept sample id <u>7232-004</u>	Dept sample id <u>7232-001</u>	Location/Matrix <u>200 East B pond</u> <u>WATER</u>
	Received <u>10/11/99</u>	Collected <u>10/06/99 06:45</u>
		Custody/SAF No <u>B99-085-5</u> <u>B99-085</u>

ANALYTE	DUPLICATE		MDA	RDL	QUALI-	TEST	ORIGINAL		MDA	QUALI-	RPD	3σ	PROT
	pCi/L	2σ ERR (COUNT)					pCi/L	2σ ERR (COUNT)					
Gross Alpha	-0.132	0.38	0.91	3.0	U	80A	0.127	0.49	1.0	U	-		
Gross Beta	-0.659	1.2	2.2	4.0	U	80B	-0.931	1.1	2.0	U	-		

200 Area Source ctzn-200-CW-1 OUQCSa

QC-DUP#1 32159

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>11/23/99</u>

DUPLICATES

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SUMMARY DATA SECTION

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

N910064-01

BOWLM3

DATA SHEET

SDG <u>7232</u>	Client/Case no <u>Hanford</u>	SDG <u>H0563</u>
Contact <u>Kevin C. Johnson</u>	Contract <u>TRB-SBB-207925</u>	
Lab sample id <u>N910064-01</u>	Client sample id <u>BOWLM3</u>	
Dept sample id <u>7232-001</u>	Location/Matrix <u>200 East B pond</u>	<u>WATER</u>
Received <u>10/11/99</u>	Collected <u>10/06/99 06:45</u>	
	Custody/SAF No <u>B99-085-5</u>	<u>B99-085</u>

ANALYTE	CAS NO	RESULT pCi/L	2 σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.127	0.49	1.0	3.0	U	80A
Gross Beta	12587-47-2	-0.931	1.1	2.0	4.0	U	80B

200 Area Source ctzn-200-CW-1 OUQCSa

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/23/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0563

METHOD SUMMARY

GROSS ALPHA IN WATER
GAS PROPORTIONAL COUNTING

Test 80A Matrix WATER
SDG 7232
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Gross Alpha
Preparation batch 6904-080					
BOWLM3	N910064-01	80		7232-001	U
BLK (QC ID=32143)	N910064-03	80		7232-003	U
LCS (QC ID=32142)	N910064-02	80		7232-002	ok
Duplicate (N910064-01)	N910064-04	80		7232-004	- U

Nominal values and limits from method RDLs (pCi/L) 3.0
200 Area Source ctzn-200-CW-1 OUQCSa

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 6904-080 2σ prep error 20.0 % Reference Lab Notebook 6904 pg. 080																
BOWLM3	N910064-01	80		1.0	0.300			37	100				33	11/02/99	11/08	GRB-111
BLK (QC ID=32143)	N910064-03	80		1.0	0.300			34	100					11/02/99	11/08	GRB-113
LCS (QC ID=32142)	N910064-02	80		0.91	0.300			34	100					11/02/99	11/08	GRB-112
Duplicate (N910064-01)	N910064-04	80		0.91	0.300			13	100				33	11/02/99	11/08	GRB-114
																(QC ID=32159)

Nominal values and limits from method 3.0 0.300 5-150 100 180

PROCEDURES REFERENCE EPA900.0
EP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES + 2 SD MDA 0.96 + 0.10
FOR 4 SAMPLES RESIDUE 30 + 22

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/23/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0563

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test 80B Matrix WATER

SDG 7232

Contact Kevin C. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG H0563

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Gross Beta
------------------	---------------	----------	----------	----------	------------

Preparation batch 6904-080

BOWLM3	N910064-01	80		7232-001	U
BLK (QC ID=32143)	N910064-03	80		7232-003	U
LCS (QC ID=32142)	N910064-02	80		7232-002	ok
Duplicate (N910064-01)	N910064-04	80		7232-004	- U

Nominal values and limits from method RDLs (pCi/L) 4.0
200 Area Source ctzn-200-CW-1 OUQCSa

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
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Preparation batch 6904-080 2σ prep error 15.0 % Reference Lab Notebook 6904 pg. 080

BOWLM3	N910064-01	80		2.0	0.300			37	100				33	11/02/99	11/08	GRB-111
BLK (QC ID=32143)	N910064-03	80		1.9	0.300			34	100					11/02/99	11/08	GRB-113
LCS (QC ID=32142)	N910064-02	80		2.3	0.300			34	100					11/02/99	11/08	GRB-112
Duplicate (N910064-01)	N910064-04	80		2.2	0.300			13	100				33	11/02/99	11/08	GRB-114
	(QC ID=32159)															

Nominal values and limits from method 4.0 0.300 5-150 100 180

PROCEDURES REFERENCE EPA900.0
EP-120 Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD MDA 2.1 ± 0.37
FOR 4 SAMPLES RESIDUE 30 ± 22

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 11/23/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/23/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG_H0563

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

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SUMMARY DATA SECTION

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Protocol Hanford
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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Lab id TMANC
Protocol Hanford
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Version 3.06
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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Lab id TMANC
Protocol Hanford
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Report date 11/23/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/23/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 1. A fixed percentage specified in the protocol.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/23/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/23/99

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SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/23/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG_H0563

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/23/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES

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SUMMARY DATA SECTION

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/23/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0563

SDG 7232
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0563

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Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0563

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
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Version 3.06
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Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-085-5

Page 1 of 1

Collector Bowers/Trice	Company Contact C Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 7N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location 200 East B pond	SAF No. B99-085			
Ice Chest No. ERC 99-005	Field Logbook No. EL 1511	Method of Shipment Fed ex			
Shipped To TMA/RECRA	Offsite Property No. A910289	Bill of Lading/Air Bill No. 423579530267			

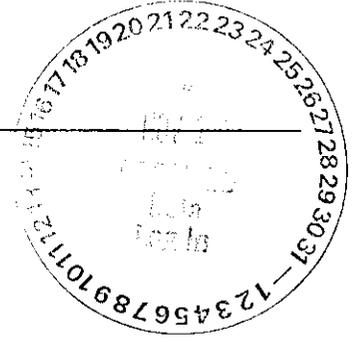
COA B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HCl or H2SO4 to pH <2 Cool			
	Type of Container	P	P	P	aG	P	P	aGs*			
Special Handling and/or Storage	No. of Container(s)	1	1	1	2	2	2	3			
	Volume	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL			
SAMPLE ANALYSIS		Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	See item (2) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)			
Sample No.	Matrix *	Sample Date	Sample Time								
BOWLM2	Water	10/6/99	0515								
BOWLM3	Water	10/6/99	0645				X				

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *
Relinquished By Trice	Date/Time 10/6/99 1320	Received By Ref # 1A	Date/Time 10/6/99 1320	(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc) Collector unavailable to relinquish samples. NOT from a Rad Area				Soil Water Vapor Other Solid Other Liquid
Relinquished By Ref # 1A	Date/Time 10/7/99 0820	Received By Nielson	Date/Time 10/7/99 0820					
Relinquished By Nielson	Date/Time 10/7/99 1430	Received By FedEx	Date/Time 10/7/99					
Relinquished By FedEx	Date/Time 10/8/99	Received By TNU M. Goldenberg	Date/Time 10/8/99					
LABORATORY SECTION	Received By							Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client:	<u>Bechtel Hanford Inc</u>	Date/Time received	<u>10-8-99</u>
CoC No.	<u>B99-085-5</u>		
Container I.D. No.	<u>ER99-005</u>	Requested TAT (Days)	<u>45</u> P.O. Received Yes [] No []
INSPECTION			
1.	Custody seals on shipping container intact?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
2.	Custody seals on shipping container dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
3.	Custody seals on sample containers intact?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
4.	Custody seals on sample containers dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
5.	Cooler Temperature: _____	Packing material is:	Wet [] Dry [<input checked="" type="checkbox"/>]
6.	Number of samples in shipping container:	<u>1</u>	
7.	Number of containers per sample:	<u>2</u> (Or see CoC _____)	
8.	Paperwork agrees with samples?	Yes [<input checked="" type="checkbox"/>]	No []
9.	Samples have:	Tape [] Hazard labels [] Rad labels [] Appropriate sample labels [<input checked="" type="checkbox"/>]	
10.	Samples are:	In good condition [<input checked="" type="checkbox"/>] Leaking [] Broken Container [] Missing []	
11.	Describe any anomalies: _____ _____ _____		
13.	Was P.M. notified of any anomalies?	Yes []	No [] Date _____
14.	Received by	<u>M. Goldenberg</u>	Date: <u>10-8-99</u> Time: <u>10:00</u>
LOGIN			
TNU W.O. No.	Group No.	Client W.O. No.	
_____	_____	_____	
PROGRAM MANAGER			
Sample holding times exceeded?	Yes []	No []	
Client Notified: Name	Date/time _____		



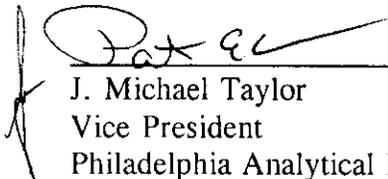
**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-085
RFW# : 9910L314
SDG# : H0563
SAF# : B99-085

W.O. # : 10985-001-001-9999-00
Date Received: 10-08-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met with the exception of pH, Nitrate, Nitrite and Phosphate which were received past hold.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blanks were within method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries were within the 75-125% control limits. The matrix spike duplicates were within the 20% RPD control limit.
8. The replicate analyses were within the 20% RPD control limit.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-16-99
Date

njpl10-314

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
Acidity	___ 305.1		
___ Alkalinity ___ Bicarbonate ___ Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chromatography:			
___ Bromide <input checked="" type="checkbox"/> Chloride <input checked="" type="checkbox"/> Fluoride	<input checked="" type="checkbox"/> 300.0	___ 9056	
<input checked="" type="checkbox"/> Nitrite <input checked="" type="checkbox"/> Nitrate <input checked="" type="checkbox"/> Phosphate	<input checked="" type="checkbox"/> 300.0	___ 9056	
<input checked="" type="checkbox"/> Sulfate ___ Formate ___ Acetate ___ Oxalate	<input checked="" type="checkbox"/> 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chlorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chlorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B	___ 9014 ___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable			___ 412 (a) ___ 4500CN-I (b)
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
<input checked="" type="checkbox"/> Nitrate-Nitrite ___ Nitrate ___ Nitrite	<input checked="" type="checkbox"/> 353.2		
Ammonia	<input checked="" type="checkbox"/> 350.3		
Total ___ Kjeldahl ___ Organic Nitrogen	___ 351.4		
Total ___ Organic ___ Inorganic Carbon	___ 415.1	___ 9060	
Oil & Grease	___ 413.1	___ 9070	
<input checked="" type="checkbox"/> pH ___ pH; paper	___ 150.1	<input checked="" type="checkbox"/> 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1	___ 420.2 ___ 9065 ___ 9066	
___ Ortho ___ Total Phosphate	___ 365.2		___ 4500-P B ___ C ___ 210A (a) ___ 2520 (b)
Salinity			
Settleable Solids	___ 160.5		
Sulfide	___ 376.1	___ 376.2	<input checked="" type="checkbox"/> 9030B/9034 (acid soluble)
Reactive ___ Cyanide ___ Sulfide		___ Section 7.3	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach		___ 1312	
Total ___ Dissolved ___ Suspended ___ Solids	160 ___ .1 ___ .2 ___ .3		
Total Organic Halides	___ 450.1	___ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
___ Total ___ Dissolved ___ Suspended	___ 160.4		
Other:		Method:	

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
 - a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
 - b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
 - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
 - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
 - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
 - f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/16/99

CLIENT: TNU-HANFORD B99-085
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9910L314

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	BOWLM3	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.50 u	MG/L	0.50	1.0
		Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		pH	5.8	PH UNITS	0.01	1.0
		Sulfide	2.0 u	MG/L	2.0	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LICB84-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.50 u	MG/L	0.50	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.50 u	MG/L	0.50	1.0
BLANK10	99LICD84-MB1	Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	99LN3053-MB1	Nitrate Nitrite	0.02 u	MG-N/L	0.02	1.0
BLANK10	99LAMD39-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	99LSD052-MB1	Sulfide	2.0 u	MG/L	2.0	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 11/16/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED	INITIAL	SPIKED	%RECOV	DILUTION
			SAMPLE	RESULT	AMOUNT		FACTOR (SPK)
-002	BOWLM3	Chloride by IC	4.7	0.00	5.0	94.1	1.0
		Chloride by IC MSD	4.8	0.00	5.0	96.6	1.0
		Fluoride by IC	10.2	0.00	10.0	102.4	1.0
		Fluoride by IC MSD	10.2	0.00	10.0	101.7	1.0
		Nitrite by IC	4.8	0.25u	5.0	96.5	1.0
		Nitrite by IC MSD	4.8	0.25u	5.0	96.3	1.0
		Nitrate by IC	4.6	0.25u	5.0	92.6	1.0
		Nitrate by IC MSD	4.7	0.25u	5.0	93.1	1.0
		Phosphate by IC	4.6	0.25u	5.0	91.5	1.0
		Phosphate by IC MSD	4.6	0.25u	5.0	91.8	1.0
		Sulfate by IC	4.7	0.50u	5.0	93.4	1.0
		Sulfate by IC MSD	4.7	0.50u	5.0	93.3	1.0
		Nitrate Nitrite	0.50	0.02u	0.50	99.4	1.0
		Nitrate Nitrite MSD	0.51	0.02u	0.50	101.4	1.0
		Ammonia, as N	0.92	0.10u	1.0	91.5	1.0
		Sulfide	9.9	0.00	10.0	99.0	1.0
		Sulfide MSD	9.9	0.00	10.0	99.0	1.0
BLANK10	99LICB84-MB1	Chloride by IC	4.7	0.25u	5.0	95.0	1.0
		Fluoride by IC	10.4	0.50u	10.0	104.1	1.0
		Nitrite by IC	4.9	0.25u	5.0	97.3	1.0
		Nitrate by IC	4.8	0.25u	5.0	96.5	1.0
		Sulfate by IC	4.8	0.50u	5.0	95.7	1.0
BLANK10	99LICD84-MB1	Phosphate by IC	4.9	0.25u	5.0	97.5	1.0
BLANK10	99LN3053-MB1	Nitrate Nitrite	0.50	0.02u	0.50	99.6	1.0
		Nitrate Nitrite MSD	0.51	0.02u	0.50	101.6	1.0
BLANK10	99LAMD39-MB1	Ammonia, as N	0.95	0.10u	1.0	95.0	1.0
		Ammonia, as N MSD	0.95	0.10u	1.0	95.2	1.0
BLANK10	99LSD052-MB1	Sulfide	10.0	2.0 u	10.0	100	1.0
		Sulfide MSD	10.0	2.0 u	10.0	100	1.0

Recra LabNet - Lionville

INORGANICS DUPLICATE SPIKE REPORT 11/16/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1		SPIKE#2	
			%RECOV	%RECOV	%RECOV	%DIFF
-002	BOWLM3	Chloride by IC	94.1	96.6	2.6	
		Fluoride by IC	102.4	101.7	0.71	
		Nitrite by IC	96.5	96.3	0.17	
		Nitrate by IC	92.6	93.1	0.56	
		Phosphate by IC	91.5	91.8	0.33	
		Sulfate by IC	93.4	93.3	0.064	
		Nitrate Nitrite	99.4	101.4	2.0	
		Sulfide	99.0	99.0	0.00	
BLANK10	99LN3053-MB1	Nitrate Nitrite	99.6	101.6	2.0	
BLANK10	99LAMD39-MB1	Ammonia, as N	95.0	95.2	0.21	
BLANK10	99LSD052-MB1	Sulfide	100	100	0.00	

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 11/16/99

CLIENT: TNU-HANFORD B99-085
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9910L314

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE RPD		FACTOR (REP)
-002REP	BOWLM3	Chloride by IC	0.25u	0.25u	NC	1.0
		Fluoride by IC	0.50u	0.50u	NC	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	0.25u	0.25u	NC	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	0.50u	0.50u	NC	1.0
		Nitrate Nitrite	0.02u	0.02u	NC	1.0
		Ammonia, as N	0.10u	0.10u	NC	1.0
		pH	5.8	5.7	1.6	1.0
		Sulfide	2.0 u	2.0 u	NC	1.0

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-085

DATE RECEIVED: 10/08/99

RFW LOT # :9910L314

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWLM3						
CHLORIDE BY IC	002	W	99LICB84	10/06/99	10/13/99	10/13/99
CHLORIDE BY IC	002 REP	W	99LICB84	10/06/99	10/13/99	10/13/99
CHLORIDE BY IC	002 MS	W	99LICB84	10/06/99	10/13/99	10/13/99
CHLORIDE BY IC	002 MSD	W	99LICB84	10/06/99	10/13/99	10/13/99
FLUORIDE BY IC	002	W	99LICB84	10/06/99	10/13/99	10/13/99
FLUORIDE BY IC	002 REP	W	99LICB84	10/06/99	10/13/99	10/13/99
FLUORIDE BY IC	002 MS	W	99LICB84	10/06/99	10/13/99	10/13/99
FLUORIDE BY IC	002 MSD	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRITE BY IC	002	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRITE BY IC	002 REP	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRITE BY IC	002 MS	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRITE BY IC	002 MSD	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRATE BY IC	002	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRATE BY IC	002 REP	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRATE BY IC	002 MS	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRATE BY IC	002 MSD	W	99LICB84	10/06/99	10/13/99	10/13/99
PHOSPHATE BY IC	002	W	99LICD84	10/06/99	10/13/99	10/13/99
PHOSPHATE BY IC	002 REP	W	99LICD84	10/06/99	10/13/99	10/13/99
PHOSPHATE BY IC	002 MS	W	99LICD84	10/06/99	10/13/99	10/13/99
PHOSPHATE BY IC	002 MSD	W	99LICD84	10/06/99	10/13/99	10/13/99
SULFATE BY IC	002	W	99LICB84	10/06/99	10/13/99	10/13/99
SULFATE BY IC	002 REP	W	99LICB84	10/06/99	10/13/99	10/13/99
SULFATE BY IC	002 MS	W	99LICB84	10/06/99	10/13/99	10/13/99
SULFATE BY IC	002 MSD	W	99LICB84	10/06/99	10/13/99	10/13/99
NITRATE NITRITE	002	W	99LN3053	10/06/99	11/10/99	11/10/99
NITRATE NITRITE	002 REP	W	99LN3053	10/06/99	11/10/99	11/10/99
NITRATE NITRITE	002 MS	W	99LN3053	10/06/99	11/10/99	11/10/99
NITRATE NITRITE	002 MSD	W	99LN3053	10/06/99	11/10/99	11/10/99
AMMONIA	002	W	99LAMD39	10/06/99	10/19/99	10/19/99
AMMONIA	002 REP	W	99LAMD39	10/06/99	10/19/99	10/19/99
AMMONIA	002 MS	W	99LAMD39	10/06/99	10/19/99	10/19/99
PH	002	W	99LPH110	10/06/99	10/13/99	10/13/99
PH	002 REP	W	99LPH110	10/06/99	10/13/99	10/13/99
SULFIDE	002	W	99LSD052	10/06/99	10/10/99	10/10/99
SULFIDE	002 REP	W	99LSD052	10/06/99	10/10/99	10/10/99

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-085

DATE RECEIVED: 10/08/99

RFW LOT # :9910L314

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	002 MS	W	99LSD052	10/06/99	10/10/99	10/10/99
SULFIDE	002 MSD	W	99LSD052	10/06/99	10/10/99	10/10/99

LAB QC:

CHLORIDE BY IC	MB1	W	99LICB84	N/A	10/13/99	10/13/99
CHLORIDE BY IC	MB1 BS	W	99LICB84	N/A	10/13/99	10/13/99
FLUORIDE BY IC	MB1	W	99LICB84	N/A	10/13/99	10/13/99
FLUORIDE BY IC	MB1 BS	W	99LICB84	N/A	10/13/99	10/13/99
NITRITE BY IC	MB1	W	99LICB84	N/A	10/13/99	10/13/99
NITRITE BY IC	MB1 BS	W	99LICB84	N/A	10/13/99	10/13/99
NITRATE BY IC	MB1	W	99LICB84	N/A	10/13/99	10/13/99
NITRATE BY IC	MB1 BS	W	99LICB84	N/A	10/13/99	10/13/99
PHOSPHATE BY IC	MB1	W	99LICD84	N/A	10/13/99	10/13/99
PHOSPHATE BY IC	MB1 BS	W	99LICD84	N/A	10/13/99	10/13/99
SULFATE BY IC	MB1	W	99LICB84	N/A	10/13/99	10/13/99
SULFATE BY IC	MB1 BS	W	99LICB84	N/A	10/13/99	10/13/99
NITRATE NITRITE	MB1	W	99LN3053	N/A	11/10/99	11/10/99
NITRATE NITRITE	MB1 BS	W	99LN3053	N/A	11/10/99	11/10/99
NITRATE NITRITE	MB1 BSD	W	99LN3053	N/A	11/10/99	11/10/99
AMMONIA	MB1	W	99LAMD39	N/A	10/19/99	10/19/99
AMMONIA	MB1 BS	W	99LAMD39	N/A	10/19/99	10/19/99
AMMONIA	MB1 BSD	W	99LAMD39	N/A	10/19/99	10/19/99
SULFIDE	MB1	W	99LSD052	N/A	10/10/99	10/10/99
SULFIDE	MB1 BS	W	99LSD052	N/A	10/10/99	10/10/99
SULFIDE	MB1 BSD	W	99LSD052	N/A	10/10/99	10/10/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-085-5	Page 1 of 1
Collector Bowers/Trice	Company Contact C Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 7N	Data Turnaround 45 Days	
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa	Sampling Location 200 East B pond	Field Logbook No. EL 1511	SAF No. B99-085	Method of Shipment Fed ex		
Ice Chest No. SML 457	Offsite Property No. A000290	Bill of Lading/Air Bill No. 423579530223				
Shipped To TMA/RECRA	COA B20CW1 671C					

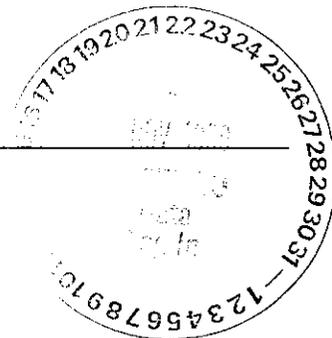
POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HCl or H2SO4 to pH <2 Cool
	Special Handling and/or Storage	Type of Container	P	P	P	aG	P	P
	No. of Container(s)	1	1	1	2	2	2	3
	Volume	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL

SAMPLE ANALYSIS	Sulfides - 9030	See item (1) in Special Instructions	NO2/NO3 - 353 1; Ammonia - 350 3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	See item (2) in Special Instructions	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol)
-----------------	-----------------	--------------------------------------	----------------------------------	------------------------	-------------------------	--------------------------------------	---

Sample No.	Matrix *	Sample Date	Sample Time							
BOWLM2	Water	10/6/99	0515	X	X	X	X	X	X	
BOWLM3	Water	10/6/99	0645	X	X	X	X	X	X	

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *
Relinquished By	Date/Time	Received By	Date/Time	(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc) collector unavailable to relinquish samples. NOT from a Rad Area				Soil Water Vapor Other Solid Other Liquid
Relinquished By	Date/Time	Received By	Date/Time					
Relinquished By	Date/Time	Received By	Date/Time					
Relinquished By	Date/Time	Received By	Date/Time					
LABORATORY SECTION	Received By	Title		Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By				Date/Time	

012



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-085
RFW# : 9910L314
SDG/SAF# : H0563/B99-085

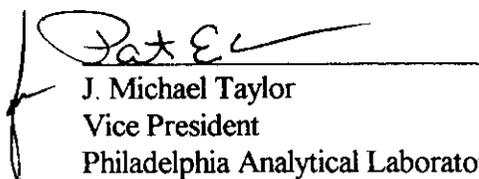
W.O.# : 10985-001-001-9999-00
Date Received: 10-08-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. The preparation/method blank for 1 analyte was outside method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
 - a.) The MB result for Zinc was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and the sample read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

- 11 The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.


J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory
mld/m10-314

10-25-99
Date



METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9910L314

Leaching Procedure: 1310 1311 1312 Other:_____

CLP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A 3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Antimony	<u> </u> 6010B <u> </u> 7041 ⁵	<u> </u> 200.7 <u> </u> 204.2			<u> </u> 99
Arsenic	<input checked="" type="checkbox"/> 6010B <u> </u> 7060A ⁵	<u> </u> 200.7 <u> </u> 206.2	<u> </u> 3113B		<u> </u> 99
Barium	<input checked="" type="checkbox"/> 6010B	<u> </u> 200.7			<u> </u> 99
Beryllium	<input checked="" type="checkbox"/> 6010B	<u> </u> 200.7			<u> </u> 99
Bismuth	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Boron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Cadmium	<input checked="" type="checkbox"/> 6010B <u> </u> 7131A ⁵	<u> </u> 200.7 <u> </u> 213.2			<u> </u> 99
Calcium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Chromium	<input checked="" type="checkbox"/> 6010B <u> </u> 7191 ⁵	<u> </u> 200.7 <u> </u> 218.2			<u> </u> SS17
Cobalt	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Copper	<input checked="" type="checkbox"/> 6010B <u> </u> 7211 ⁵	<u> </u> 200.7 <u> </u> 220.2			<u> </u> 99
Iron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Lead	<input checked="" type="checkbox"/> 6010B <u> </u> 7421 ⁵	<u> </u> 200.7 <u> </u> 239.2	<u> </u> 3113B		<u> </u> 99
Lithium	<u> </u> 6010B <u> </u> 7430 ⁴	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Magnesium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Manganese	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Mercury	<u> </u> 7470A ³ <u> </u> 7471A ³	<u> </u> 245.1 ² <u> </u> 245.5 ²			<u> </u> 99
Molybdenum	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Nickel	<input checked="" type="checkbox"/> 6010B	<u> </u> 200.7			<u> </u> 99
Potassium	<u> </u> 6010B <u> </u> 7610 ⁴	<u> </u> 200.7 <u> </u> 258.1 ⁴			<u> </u> 99
Rare Earths	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Selenium	<input checked="" type="checkbox"/> 6010B <u> </u> 7740 ⁵	<u> </u> 200.7 <u> </u> 270.2	<u> </u> 3113B		<u> </u> 99
Silicon	<u> </u> 6010B ¹	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silica	<u> </u> 6010B	<u> </u> 200.7		<u> </u> 1620	<u> </u> 99
Silver	<input checked="" type="checkbox"/> 6010B <u> </u> 7761 ⁵	<u> </u> 200.7 <u> </u> 272.2			<u> </u> 99
Sodium	<u> </u> 6010B <u> </u> 7770 ⁴	<u> </u> 200.7 <u> </u> 273.1 ⁴			<u> </u> 99
Strontium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Thallium	<u> </u> 6010B <u> </u> 7841 ⁵	<u> </u> 200.7 <u> </u> 279.2 <u> </u> 200.9			<u> </u> 99
Tin	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Titanium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Uranium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Vanadium	<input checked="" type="checkbox"/> 6010B	<u> </u> 200.7			<u> </u> 99
Zinc	<input checked="" type="checkbox"/> 6010B	<u> </u> 200.7			<u> </u> 99
Zirconium	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99

Other: _____

Method: _____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/24/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-002	BOWLM3	Silver, Total	1.0	u UG/L	1.0	1.0
		Arsenic, Total	3.3	u UG/L	3.3	1.0
		Barium, Total	0.75	UG/L	0.30	1.0
		Beryllium, Total	0.10	u UG/L	0.10	1.0
		Cadmium, Total	0.30	u UG/L	0.30	1.0
		Chromium, Total	0.80	u UG/L	0.80	1.0
		Copper, Total	1.2	u UG/L	1.2	1.0
		Nickel, Total	1.2	u UG/L	1.2	1.0
		Lead, Total	2.1	u UG/L	2.1	1.0
		Selenium, Total	3.7	u UG/L	3.7	1.0
		Vanadium, Total	0.60	u UG/L	0.60	1.0
		Zinc, Total	9.2	UG/L	0.80	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/24/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK1	99L0697-MB1	Silver, Total	1.0	u UG/L	1.0	1.0
		Arsenic, Total	3.3	u UG/L	3.3	1.0
		Barium, Total	0.52	UG/L	0.30	1.0
		Beryllium, Total	0.10	u UG/L	0.10	1.0
		Cadmium, Total	0.30	u UG/L	0.30	1.0
		Chromium, Total	0.80	u UG/L	0.80	1.0
		Copper, Total	1.2	u UG/L	1.2	1.0
		Nickel, Total	1.5	UG/L	1.2	1.0
		Lead, Total	2.1	u UG/L	2.1	1.0
		Selenium, Total	3.7	u UG/L	3.7	1.0
		Vanadium, Total	0.60	u UG/L	0.60	1.0
		Zinc, Total	4.9	UG/L	0.80	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/24/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	BOWLM3	Silver, Total	50.4	1.0 u	50.0	100.8	1.0
		Arsenic, Total	1980	3.3 u	2000	98.9	1.0
		Barium, Total	1920	0.75	2000	95.9	1.0
		Beryllium, Total	49.3	0.10u	50.0	98.6	1.0
		Cadmium, Total	48.9	0.30u	50.0	97.8	1.0
		Chromium, Total	197	0.80u	200	98.7	1.0
		Copper, Total	243	1.2 u	250	97.0	1.0
		Nickel, Total	480	1.2 u	500	95.9	1.0
		Lead, Total	487	2.1 u	500	97.4	1.0
		Selenium, Total	1980	3.7 u	2000	99.0	1.0
		Vanadium, Total	504	0.60u	500	100.8	1.0
		Zinc, Total	485	9.2	500	95.1	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/24/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-002REP	BOWLM3	Silver, Total	1.0 u	1.0 u	NC	1.0
		Arsenic, Total	3.3 u	3.3 u	NC	1.0
		Barium, Total	0.75	0.38	65.5	1.0
		Beryllium, Total	0.10u	0.10u	NC	1.0
		Cadmium, Total	0.30u	0.30u	NC	1.0
		Chromium, Total	0.80u	0.80u	NC	1.0
		Copper, Total	1.2 u	1.2 u	NC	1.0
		Nickel, Total	1.2 u	1.2 u	NC	1.0
		Lead, Total	2.1 u	2.1 u	NC	1.0
		Selenium, Total	3.7 u	3.7 u	NC	1.0
		Vanadium, Total	0.60u	0.60u	NC	1.0
		Zinc, Total	9.2	1.4	147.2	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/24/99

CLIENT: TNU-HANFORD B99-085

RECRA LOT #: 9910L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	99L0697-LC1	Silver, LCS	493	500	UG/L	98.7
		Arsenic, LCS	9820	10000	UG/L	98.2
		Barium, LCS	4940	5000	UG/L	98.8
		Beryllium, LCS	248	250	UG/L	99.0
		Cadmium, LCS	246	250	UG/L	98.2
		Chromium, LCS	495	500	UG/L	99.0
		Copper, LCS	1230	1250	UG/L	98.7
		Nickel, LCS	1960	2000	UG/L	97.9
		Lead, LCS	2440	2500	UG/L	97.8
		Selenium, LCS	9880	10000	UG/L	98.8
		Vanadium, LCS	2530	2500	UG/L	101.0
		Zinc, LCS	987	1000	UG/L	98.7

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-085

DATE RECEIVED: 10/08/99

RFW LOT # :9910L314

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWLM3						
SILVER, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
SILVER, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
SILVER, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
ARSENIC, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
ARSENIC, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
ARSENIC, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
BARIUM, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
BARIUM, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
BARIUM, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
BERYLLIUM, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
BERYLLIUM, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
BERYLLIUM, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
CADMIUM, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
CADMIUM, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
CADMIUM, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
CHROMIUM, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
CHROMIUM, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
CHROMIUM, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
COPPER, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
COPPER, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
COPPER, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
NICKEL, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
NICKEL, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
NICKEL, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
LEAD, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
LEAD, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
LEAD, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
SELENIUM, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
SELENIUM, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
SELENIUM, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
VANADIUM, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
VANADIUM, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99
VANADIUM, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99
ZINC, TOTAL	002	W	99L0697	10/06/99	10/14/99	10/18/99
ZINC, TOTAL	002 REP	W	99L0697	10/06/99	10/14/99	10/18/99

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-085

DATE RECEIVED: 10/08/99

RFW LOT # :9910L314

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	002 MS	W	99L0697	10/06/99	10/14/99	10/18/99

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
SILVER, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
ARSENIC LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
ARSENIC, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
BARIUM LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
BARIUM, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
BERYLLIUM LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
BERYLLIUM, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
CADMIUM LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
CADMIUM, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
CHROMIUM LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
CHROMIUM, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
COPPER LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
COPPER, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
NICKEL LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
NICKEL, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
LEAD LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
LEAD, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
SELENIUM LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
SELENIUM, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
VANADIUM LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
VANADIUM, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99
ZINC LABORATORY	LC1 BS	W	99L0697	N/A	10/14/99	10/18/99
ZINC, TOTAL	MB1	W	99L0697	N/A	10/14/99	10/18/99

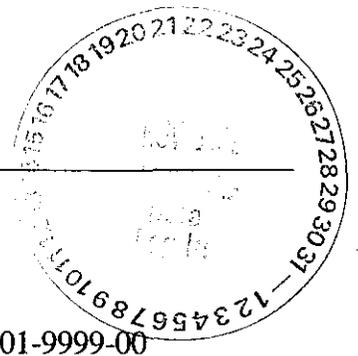
Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-085-5	Page 1 of 1
Collector Bowers/Trice		Company Contact C Cearlock		Telephone No. 372-9574		Project Coordinator TRENT, SJ	
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa		Sampling Location 200 East B pond		SAF No. B99-085		Price Code 7N Data Turnaround 45 Days	
Ice Chest No. SML 457		Field Logbook No. EL 1511		Method of Shipment Fed ex			
Shipped To TMA/RECRA RECRA		Offsite Property No. ACM0290		Bill of Lading/Air Bill No. 423579530223			
COA B20CW1671C							

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HCl or H2SO4 to pH <2 Cool			
	Type of Container	P	P	P	aG	P	P	aGs*			
	No. of Container(s)	1	1	1	2	2	2	3			
Special Handling and/or Storage	Volume	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL			
SAMPLE ANALYSIS		Sulfides - 9030	See item (1) in Special Instructions.	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	See item (2) in Special Instructions.	VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)			
Sample No.	Matrix *	Sample Date	Sample Time								
BOWLM2	Water	10/6/99	0515 ^{10/199}	X	X	X	X	X	X		
BOWLM3	Water	10/6/99	0645	X	X	X	X	X	X		

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By <i>Chie</i>	Date/Time 10/6/99 1320	Received By <i>Ref IA</i>	Date/Time 10/6/99 1320	(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc) Collector unavailable to relinquish samples. Not from a Red Area				Soil Water Vapor Other Solid Other Liquid	
Relinquished By <i>Ref #1A</i>	Date/Time 10/7/99 0820	Received By <i>R Nielson</i>	Date/Time 10/7/99 0820						
Relinquished By <i>R Nielson</i>	Date/Time 10/7/99 1430	Received By <i>Fed Ex</i>	Date/Time						
Relinquished By <i>Fed Ex</i>	Date/Time 10/8/99 0910	Received By <i>Vicki Hernandez</i>	Date/Time 10/8/99 0910						
LABORATORY SECTION	Received By	Title		Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time	

012

**Recra LabNet Philadelphia
Analytical Report**



Client: TNU HANFORD B99-085
RFW #: 9910L314
SDG/SAF#: H0563/B99-085

W.O. #: #: 10985-001-001-9999-00
Date Received: 10-08-99

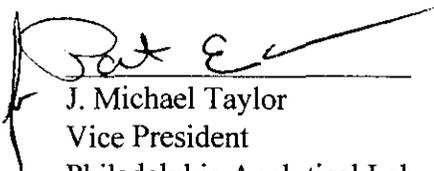
GC SCAN

The set of samples consisted of two (2) water samples collected on 10-06-99.

The samples and their associated QC samples were prepared on 10-15-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and Butanol on 10-16-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The samples were packaged and stored as specified in the method protocol; the cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. All initial calibrations associated with this data set were within acceptance criteria.
4. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
5. Surrogates were not used for this analysis.
6. The blank spike recovery was within advisory control limits of 50%-150%.
7. All matrix spike recoveries were within advisory control limits of 50%-150%.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-5-99
Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 6 pages.

001

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

- U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I** = Interference.

ABBREVIATIONS

- BS** = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD** = Indicates blank spike duplicate.
- MS** = Indicates matrix spike.
- MSD** = Indicates matrix spike duplicate.
- DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA** = Not Applicable.
- DF** = Dilution Factor.
- NR** = Not Required.
- SP** = Indicates spiked compound.

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 11/03/99 13:11

RFW Batch Number: 9910L314

Client: TNU-HANFORD B99-085

Work Order: 10985-001-001-9999-00

Page: 1

	Cust ID:	BOWLM2	BOWLM2	BOWLM2	BOWLM3	BLK	BLK BS
Sample	RFW#:	001	001 MS	001 MSD	002	99LLC157-MB1	99LLC157-MB1
Information	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

	fl	fl	fl	fl	fl	fl
n-Propyl Alcohol	5.0 U	111 %	115 %	5.0 U	5.0 U	104 %
Ethanol	5.0 U					

003

Handwritten signature

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Recra LabNet - Lionville Laboratory
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/08/99

RFW LOT # :9910L314

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWLM2	001	W	99LLC157	10/06/99	10/15/99	10/16/99
BOWLM2	001 MS	W	99LLC157	10/06/99	10/15/99	10/16/99
BOWLM2	001 MSD	W	99LLC157	10/06/99	10/15/99	10/16/99
BOWLM3	002	W	99LLC157	10/06/99	10/15/99	10/16/99

LAB QC:

BLK	MB1	W	99LLC157	N/A	10/15/99	10/16/99
BLK	MB1 BS	W	99LLC157	N/A	10/15/99	10/16/99

W. J. [Signature]
10/13/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-085-5		Page 1 of 1	
Collector Bowers/Trice		Company Contact C Cearlock		Telephone No. 372-9574		Project Coordinator TRENT, SJ		Price Code 7N	
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa		Sampling Location 200 East B pond		SAF No. B99-085		Data Turnaround 45 Days			
Ice Chest No. SML 457		Field Logbook No. EL 1511		Method of Shipment Fed ex					
Shipped To TMA/RECRA RECRA		Offsite Property No. ACR0290		Bill of Lading/Air Bill No. 423579530223					
COA B20CW1671C									

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HCl or H2SO4 to pH <2 Cool			
	Type of Container	P	P	P	aG	P	P	aGs*			
Special Handling and/or Storage	No. of Container(s)	1	1	1	2	2	2	3			
	Volume	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL			
SAMPLE ANALYSIS		Sulfides - 9010	See item (1) in Special Instructions	NO2/NO3 - 353.1; Ammonia - 350.3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	See item (2) in Special Instructions	VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)			
Sample No.	Matrix *	Sample Date	Sample Time								
BOWLM2	Water	10/6/99	0515	X	X	X	X	X	X		
BOWLM3	Water	10/6/99	0645	X	X	X	X	X	X		

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time	(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc) Collector unavailable to relinquish samples. NOT from a Red Area				Soil Water Vapor Other Solid Other Liquid	
Chloe	10/6/99 1320	Ref IA	10/6/99 1320								
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time						
Ref #1A	10/7/99 0820	R Nielsen	10/7/99 0820	Fed Ex							
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time						
Fed Ex	10/8/99 0910	Keith Hernandez	10/8/99 0910								
LABORATORY SECTION	Received By	Title								Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method				Disposed By				Date/Time		



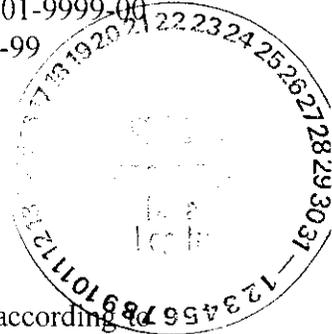
a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-085
RFW# : 9910L314
SDG/SAF #: H0563/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 10-08-99



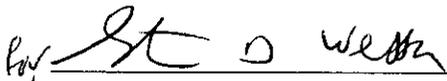
SEMIVOLATILE

One (1) water sample was collected on 10-06-99.

The sample and its associated QC samples were extracted on 10-12-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 10-20-99.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding times for extraction and analysis were met.
3. Non-target compounds were detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminant Di-n-butylphthalate at a level less than the CRQL.
8. The sample was spectrally searched for Butylated Hydroxytoluene; however, it was not identified in the sample.


J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-15-99
Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

GLOSSARY OF BNA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- A** = Indicates that a TIC is a suspected aldol-condensation product.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.



CO

Cust ID:	BOWLM3	BOWLM3	BOWLM3	SBLKER	SBLKER BS
RFW#:	002	002 MS	002 MSD	99LE1240-MB1	99LE1240-MB1
2-Chloronaphthalene	10 U	20 U	20 U	10 U	10 U
2-Nitroaniline	25 U	50 U	50 U	25 U	25 U
Dimethylphthalate	10 U	20 U	20 U	10 U	10 U
Acenaphthylene	10 U	20 U	20 U	10 U	10 U
2,6-Dinitrotoluene	10 U	20 U	20 U	10 U	10 U
3-Nitroaniline	25 U	50 U	50 U	25 U	25 U
Acenaphthene	10 U	49 %	88 %	10 U	79 %
2,4-Dinitrophenol	25 U	50 U	50 U	25 U	25 U
4-Nitrophenol	25 U	30 %	76 %	25 U	59 %
Dibenzofuran	10 U	20 U	20 U	10 U	10 U
2,4-Dinitrotoluene	10 U	46 %	92 %	10 U	72 %
Diethylphthalate	0.8 J	20 U	20 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	20 U	20 U	10 U	10 U
Fluorene	10 U	20 U	20 U	10 U	10 U
4-Nitroaniline	25 U	50 U	50 U	25 U	25 U
4,6-Dinitro-2-methylphenol	25 U	50 U	50 U	25 U	25 U
N-Nitrosodiphenylamine (1)	10 U	20 U	20 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	20 U	20 U	10 U	10 U
Hexachlorobenzene	10 U	20 U	20 U	10 U	10 U
Pentachlorophenol	25 U	41 %	86 %	25 U	68 %
Phenanthrene	10 U	20 U	20 U	10 U	10 U
Anthracene	10 U	20 U	20 U	10 U	10 U
Carbazole	10 U	20 U	20 U	10 U	10 U
Di-n-butylphthalate	0.9 JB	20 U	1 JB	0.8 J	10 U
Fluoranthene	10 U	20 U	20 U	10 U	10 U
Pyrene	10 U	62 %	80 %	10 U	72 %
Butylbenzylphthalate	10 U	20 U	20 U	10 U	10 U
3,3'-Dichlorobenzidine	10 U	20 U	20 U	10 U	10 U
Benzo(a)anthracene	10 U	20 U	20 U	10 U	10 U
Chrysene	10 U	20 U	20 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	20 U	20 U	10 U	10 U
Di-n-octyl phthalate	10 U	20 U	20 U	10 U	10 U
Benzo(b)fluoranthene	10 U	20 U	20 U	10 U	10 U
Benzo(k)fluoranthene	10 U	20 U	20 U	10 U	10 U
Benzo(a)pyrene	10 U	20 U	20 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	20 U	20 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	20 U	20 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	20 U	20 U	10 U	10 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BOWLM3

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 9910L314-002

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A102015

Level: (low/med) LOW Date Received: 10/08/99

% Moisture: decanted: (Y/N) Date Extracted: 10/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/20/99

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

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

Number TICs found: 6

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	6.19	7	JB
2.	UNKNOWN	6.88	9	JB
3.	UNKNOWN	7.14	7	J
4.	UNKNOWN	7.51	10	JB
5.	UNKNOWN	8.12	20	J
6.	UNKNOWN	13.30	5	JB

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKER

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-085

Matrix: (soil/water) WATER Lab Sample ID: 99LE1240-MB1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A102011

Level: (low/med) LOW Date Received: 10/12/99

% Moisture: decanted: (Y/N) Date Extracted: 10/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/20/99

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0 CONCENTRATION UNITS:

Number TICs found: 8 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	6.11	3	J
2.	UNKNOWN	6.19	4	J
3.	UNKNOWN	6.89	5	J
4.	UNKNOWN	7.44	3	J
5.	UNKNOWN	7.51	7	J
6.	UNKNOWN	11.51	3	J
7.	UNKNOWN	12.55	9	J
8.	UNKNOWN	13.32	30	J

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/08/99

RFW LOT # :9910L314

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWLM3	002	W	99LE1240	10/06/99	10/12/99	10/20/99
BOWLM3	002 MS	W	99LE1240	10/06/99	10/12/99	10/20/99
BOWLM3	002 MSD	W	99LE1240	10/06/99	10/12/99	10/20/99

LAB QC:

SBLKER	MB1	W	99LE1240	N/A	10/12/99	10/20/99
SBLKER	MB1 BS	W	99LE1240	N/A	10/12/99	10/20/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-085-5	Page 1 of 1	10	
Collector Bowers/Trice		Company Contact C Cearlock		Telephone No. 372-9574		Project Coordinator TRENT, SJ		Price Code 7N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa		Sampling Location 200 East B pond		SAF No. B99-085					
Ice Chest No. SML 457		Field Logbook No. EL 1511		Method of Shipment Fed ex					
Shipped To TMA/RECRA RECRA		Offsite Property No. AC90290		Bill of Lading/Air Bill No. 423579530223					
COA B20CW1671C									

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HCl or H2SO4 to pH <2 Cool			
	Type of Container	P	P	P	aG	P	P	aGs*			
Special Handling and/or Storage	No. of Container(s)	1	1	1	2	2	2	3			
	Volume	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL			
SAMPLE ANALYSIS		Sulfides - 9030	See item (1) in Special Instructions	NO2/NO3 - 353 1; Ammonia - 350 3	Semi-VOA - 8270A (TCL)	Gross Alpha, Gross Beta	See item (2) in Special Instructions	VOA - 8260A (TCL), VOA - 8260A (Add- On) (1- Propanol, Ethanol)			
Sample No.	Matrix *	Sample Date	Sample Time								
BOWLM2	Water	10/6/99	0515 ^{10/19/99}	X	X	X	X	X	X		
BOWLM3	Water	10/6/99	0645	X	X	X	X	X	X		

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time	(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc) Collector unavailable to relinquish samples. Not from a Rad Area					
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time						
LABORATORY SECTION		Received By	Date/Time	Title						Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time	



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client : TNU-HANFORD B99-085
RFW# : 9910L314
SDG/SAF #: H0563/B99-085

W.O. #: 10985-001-001-9999-00
Date Received: 10-08-99

GC/MS VOLATILE

Two (2) water samples were collected on 10-06-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 10-15-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminants Methylene Chloride, Acetone and the target compound 2-Butanone at levels less than the CRQL.



J. Michael Taylor

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-15-99

Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U** = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J** = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E** = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D** = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I** = Interference.
- NQ** = Result qualitatively confirmed but not able to quantify.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X** = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y** = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.



Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 11/11/99 22:31

RFW Batch Number: 9910L314

Client: TNU-HANFORD B99-085

Work Order: 10985001001 Page: 1a

04

Sample Information	Cust ID:	BOWLM2	BOWLM3	BOWLM3	BOWLM3	VBLKWK	VBLKWK BS
	RFW#:	001	002	002 MS	002 MSD	99LVH412-MB1	99LVH412-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate	Toluene-d8	93 %	96 %	93 %	89 %	94 %	92 %
Recovery	Bromofluorobenzene	89 %	94 %	88 %	86 %	95 %	88 %
	1,2-Dichloroethane-d4	85 %	90 %	83 %	85 %	96 %	85 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Chloromethane		1 J	1 J	10 U	2 J	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride		10 B	9 B	10 B	9 B	4 J	6 B
Acetone		6 JB	4 JB	5 JB	4 JB	4 J	4 JB
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	5 U	96 %	91 %	5 U	95 %
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	5 U	5 U	5 U	5 U
Chloroform		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone		2 JB	10 U	10 U	10 U	2 J	2 JB
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	5 U	95 %	94 %	5 U	95 %
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Benzene		5 U	5 U	99 %	97 %	5 U	101 %
Trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Toluene		5 U	5 U	99 %	94 %	5 U	98 %

*= Outside of EPA CLP QC limits.

AW
11-12-99

Cust ID: BOWLM2 BOWLM3 BOWLM3 BOWLM3 VBLKWK VBLKWK BS

RFW#: 001 002 002 MS 002 MSD 99LVH412-MB1 99LVH412-MB1

Chlorobenzene	5 U	5 U	97 %	93 %	5 U	96 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-085

DATE RECEIVED: 10/08/99

RFW LOT # :9910L314

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOWLM2	001	W	99LVH412	10/06/99	N/A	10/15/99
BOWLM3	002	W	99LVH412	10/06/99	N/A	10/15/99
BOWLM3	002 MS	W	99LVH412	10/06/99	N/A	10/15/99
BOWLM3	002 MSD	W	99LVH412	10/06/99	N/A	10/15/99

LAB QC:

VBLKWK	MB1	W	99LVH412	N/A	N/A	10/15/99
VBLKWK	MB1 BS	W	99LVH412	N/A	N/A	10/15/99

AW
11-10-99



9910L314

A11 FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client <u>TNU-Hanford B99-085</u>	Refrigerator #	1	2	2	2	2	2
Est. Final Proj. Sampling Date	#/Type Container	Liquid	<u>3AG-2AG</u>	<u>1PL</u>	<u>2PL</u>	<u>1PL</u>	<u>2PL</u>
Project # <u>10485-001-001-9999-00</u>		Solid					
Project Contact/Phone #	Volume	Liquid	<u>40 IL</u>	<u>500</u>	<u>1L</u>	<u>1L</u>	<u>1L</u>
RECRA Project Manager <u>OS</u>		Solid	<u>16L 2R</u>				
QC <u>Spec</u> Del <u>std</u> TAT <u>30 days</u>	Preservatives	<u>H2SO4</u>	<u>---</u>	<u>---</u>	<u>HNO3</u>	<u>H2SO4</u>	<u>---</u>
Date Rec'd <u>10/8/99</u> Date Due <u>11/7/99</u>	ANALYSES REQUESTED	ORGANIC				INORG	
Account #		VOA	BNA	Pest/PCB	Herb	Metal	CN

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only													
			MS	MSD				0029H	0029L	0029M	15FD	2020	1030Z	1030M	0800						
	<u>001</u>	<u>BOW L m 2</u>	<u>X</u>	<u>X</u>	<u>W</u>	<u>10/6/99</u>	<u>0515</u>	<u>3</u>	<u>✓</u>												
	<u>002</u>	<u>+ L 3</u>	<u>X</u>	<u>X</u>	<u>L</u>	<u>10/6/99</u>	<u>0645</u>	<u>3</u>	<u>✓</u>												

Special Instructions:
Self # B99-085
COMPOSITE WASTE

- DATE/REVISIONS:
- met ① = As, Ba, Cd, Cr, Pb, Se, Ag, Cu,
 - Ni, V, Zn, Be
 - Ang ② = ICCL, ICFL, ICNO3, ICNO2, ICPO4,
 - ICSO4, IPH
 -
 -

RECRA LabNet Use Only	
Samples were	COC Tape was:
1) Shipped <u>✓</u> or Hand Delivered <u>---</u>	1) Present on Outer Package <u>Y</u> or N
Airbill # <u>*</u>	2) Unbroken on Outer Package <u>Y</u> or N
2) Ambient or Chilled <u>---</u>	3) Present on Sample <u>Y</u> or N
3) Received in Good Condition <u>Y</u> or N	4) Unbroken on Sample <u>Y</u> or N
4) Labels Indicate Properly Preserved <u>Y</u> or N	COC Record Present Upon Sample Rec't <u>Y</u> or N
5) Received Within Holding Times <u>Y</u> or N	Cooler Temp. <u>1/6</u> C

Relinquished by	Received by	Date	Time
<u>Fed Ex</u>	<u>P. [Signature]</u>		<u>0910</u>

Relinquished by

Received by

Date

Time

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or N Y

NOTES:

4235 7953 0223 PH, NO3, NO2, PO4 out

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-085-5	Page 1 of 1
Collector Bowers/Trice		Company Contact C Cearlock		Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 7N Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU - QC Sa		Sampling Location 200 East B pond		SAF No. B99-085		
Ice Chest No. SML-457		Field Logbook No. EL 1511		Method of Shipment Fed ex		
Shipped To TMA/RECRA RECRA		Offsite Property No. A990290		Bill of Lading/Air Bill No. 423579530223		
COA B20CW1671C						

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	ZnAc+NaOH to pH >9 Cool	Cool 4C	H2SO4 to pH <2 Cool 4C	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HCl or H2SO4 to pH <2 Cool			
	Type of Container	P	P	P	aG	P	P	aGs*			
	No. of Container(s)	1	1	1	2	2	2	3			
Special Handling and/or Storage	Volume	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	40mL			
SAMPLE ANALYSIS		Sulfides - 9030	See item (1) in Special Instructions	NO2/NO3 - 353 J; Ammonia - 350 J	Semi-VOA - 8270A (TCL)	Gross Alpha; Gross Beta	See item (2) in Special Instructions	VOA - 8260A (TCL); VOA - 8260A (Add- On) (1 - Propanol, Ethanol)			
Sample No.	Matrix *	Sample Date	Sample Time								
BOWLM2	Water	10/6/99	0515	X	X	X	X	X			
BOWLM3	Water	10/6/99	0645	X	X	X	X	X			

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *
Relinquished By <i>Chie</i>	Date/Time 10/6/99 1320	Received By <i>Ref IA</i>	Date/Time 10/6/99 1320	(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Copper, Nickel, Vanadium, Zinc) <i>Collector unavailable to relinquish samples.</i> <i>NOT from a Red Area</i>				Soil Water Vapor Other Solid Other Liquid
Relinquished By <i>Ref #1A</i>	Date/Time 10/7/99 0820	Received By <i>R Nielson</i>	Date/Time 10/7/99 0920					
Relinquished By <i>R Nielson</i>	Date/Time 10/7/99 1430	Received By <i>Fed Ex</i>	Date/Time					
Relinquished By <i>Fed Ex</i>	Date/Time 10/8/99 0910	Received By <i>Kids Heron</i>	Date/Time 10/8/99 0910					
LABORATORY SECTION	Received By	Title		Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time		