



0053952

H0892



Recra LabNet Philadelphia  
208 Welsh Pool Road  
Lionville, PA 19341-1333

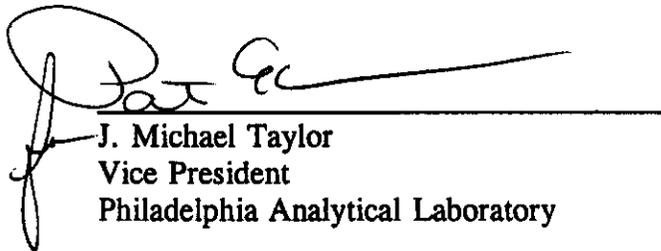
### Analytical Report

Client : TNU-HANFORD B99-093  
RFW# : 0006L693  
SDG# : H0892  
SAF# : B99-093

W.O. # : 10985-001-001-9999-00  
Date Received: 06-29-00

### INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 8 solid samples.
2. The samples were 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.
4. The cooler temperature was recorded on the chain-of-custody.
5. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
6. Results for solid samples are reported on a dry weight basis.
7. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
\_\_\_\_\_  
J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory

08-14-00  
Date

npl06-693

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.

**WET CHEMISTRY**  
**METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS**

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	___ D2216-80		
% Moisture	✓ D2216-80		___ ILMO4.0 (e)
% Solids	✓ D2216-80		___ ILMO4.0 (e)
% Volatile Solids	___ D2216-80		
ASTM Extraction in Water	___ D3987-81/85		
BTU	___ D240-87		
CEC		___ 9081	___ c
Chromium VI		___ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		___ 1110(mod) ___ 9045C	
Cyanide, Total		___ 9010B	___ ILMO4.0 (e)
Cyanide, Reactive		___ Section 7.3	
Halides, Extractable Organic		___ 9020B	___ EPA 600/4/84-008
Halides, Total		___ 9020B	___ EPA 600/4/84-008
EP Toxicity		___ 1310A	
Flash Point		___ 1010	
Ignitability		___ 1010	
Oil & Grease		___ 9071A	
Carbon, Total Organic		___ 9060	___ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	___ D240-87(mod)	___ 5050	
Petroleum Hydrocarbons, Total Recoverable		___ 9071	___ EPA 418.1
pH, Soil		___ 9045C	
Sulfide, Reactive		___ Section 7.3	
Sulfide		___ 9030B(mod)	
Specific Gravity	___ D1429-76C/	___ D5057-90	
Sulfur, Total		___ 9056	
Synthetic Preparation Leach		___ 1312	
Paint Filter		9095A	
<b>Other:</b>	<b>Method:</b>		
<b>Other:</b>	<b>Method</b>		

**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.

Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 07/18/00

CLIENT: TNU-HANFORD B99-093  
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0006L693

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	BOYM46	% Moisture	9.1	%	0.01	1.0
		% Solids	90.9	%	0.01	1.0
-002	BOYM47	% Moisture	19.6	%	0.01	1.0
		% Solids	80.4	%	0.01	1.0
-003	BOYM48	% Moisture	14.2	%	0.01	1.0
		% Solids	85.8	%	0.01	1.0
-004	BOYM49	% Moisture	6.4	%	0.01	1.0
		% Solids	93.6	%	0.01	1.0
-005	BOYM42	% Moisture	14.0	%	0.01	1.0
		% Solids	86.0	%	0.01	1.0
-006	BOYM43	% Moisture	13.0	%	0.01	1.0
		% Solids	87.0	%	0.01	1.0
-007	BOYM44	% Moisture	8.0	%	0.01	1.0
		% Solids	92.0	%	0.01	1.0
-008	BOYM45	% Moisture	12.0	%	0.01	1.0
		% Solids	88.0	%	0.01	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 07/18/00

CLIENT: TNU-HANFORD B99-093  
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 0006L693

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-----	-----	-----	-----	-----	-----	
-004REP	BOYM49	% Moisture	6.4	6.4	0.16	1.0
		% Solids	93.6	93.6	0.011	1.0

RECRA LabNet Use Only  
00060693

# Custody Transfer Record/Lab Work Request Page 1 of 1



FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(9) Perrone  
60gms

Client <u>TNU-Hanford B99-093</u>	Refrigerator # <u>1</u>
Est. Final Proj. Sampling Date _____	#/Type Container Liquid _____ Solid <u>1FG</u>
Project # <u>10985-001-001-999900</u>	Volume Liquid _____ Solid <u>250</u>
Project Contact/Phone # _____	Preservatives <u>-</u>
RECRA Project Manager <u>AS</u>	ANALYSES REQUESTED →
QC Spec <u>Del Std TAT 30day</u>	
Date Rec'd <u>6-29-00</u> Date Due <u>7-29-00</u>	ORGANIC VOA BNA Pest/PCB Herb
Account # _____	INORG 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				1	2	3	4	5	6	7	8	9	10				
													IRMS								
	001	B09M46			SO	6-27-00	0945	✓													✓
	002	47					0850	✓													✓
	003	48					1000	✓													✓
	004	49					1015	✓													✓
	005	42					0850	✓													✓
	006	43					0905	✓													✓
	007	44					0915	✓													✓
	008	45					0930	✓													✓

Special Instructions: Saf B99-093

DATE/REVISIONS:  
 1. Run Matrix QC  
 2. 7:500 Samples logged for 90% moisture  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_  
 5. \_\_\_\_\_  
 6. \_\_\_\_\_

RECRA LabNet Use Only	
Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered _____	COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> or N
Airbill # <u>See below</u>	2) Unbroken on Outer Package <input checked="" type="checkbox"/> or N
2) Ambient or <u>Chilled</u>	3) Present on Sample <input checked="" type="checkbox"/> or N
3) Received in Good Condition <input checked="" type="checkbox"/> or N	4) Unbroken on Sample <input checked="" type="checkbox"/> or N
4) Labels Indicate Property Preserved <input checked="" type="checkbox"/> or N	COC Record Present Upon Sample Rec't <input checked="" type="checkbox"/> or N
5) Received Within Holding Times <input checked="" type="checkbox"/> or N	Cooler Temp. <u>4.6</u> °C

Relinquished by	Received by	Date	Time
FedEx	T. Beppel	6-29-00	0930

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or  N

NOTES:  
423579536839



**Recra LabNet Philadelphia  
208 Welsh Pool Road  
Lionville, PA19341-1333  
Analytical Report**

**Client:** TNU-HANFORD B99-093  
**RFW #:** 0006L693  
**SDG/SAF #:** H0892/B99-093

**W.O. #:** 10985-001-001-9999-00  
**Date Received:** 06-29-2000

**GC/MS VOLATILE**

Eight (8) solid samples were collected on 06-27-2000.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260B for client specified Volatile target compound Carbon Tetrachloride on 07-05,10-2000.

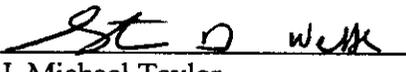
The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for the analysis was met.
3. All samples required a medium level analysis and additional dilution due to high levels of target compounds.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.

All blank spike recoveries were within EPA QC limits.

The target compound is not included in the spiking solution. (CLP spike recoveries have been reported on the Form 3.)

6. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

*Jug*   
J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory

07-31-00  
Date



som\group\data\voa\tnu-hanford-06-693.doc

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 1 1 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, Special List

Report Date: 07/26/00 11:47

04

RFW Batch Number: 0006L693

Client: TNU-HANFORD B99-093

Work Order: 10985001001 Page: 1a

	Cust ID:	B0YM46	B0YM47	B0YM48	B0YM49	B0YM49	B0YM49
Sample Information	RFW#:	001	002	003	004	004 MS	004 MSD
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
	D.F.:	1030	2630	205	1030	1030	1030
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
	Level:	MED	MED	MED	MED	MED	MED
Surrogate	1,2-Dichloroethane-d4	110 %	115 %	110 %	112 %	118 %	117 %
Recovery	Toluene-d8	96 %	99 %	97 %	100 %	99 %	98 %
	Bromofluorobenzene	94 %	98 %	95 %	97 %	98 %	97 %
Carbon Tetrachloride		0.25E+08	0.28E+08	2700000	0.13E+08	0.13E+08	0.13E+08

	Cust ID:	B0YM42	B0YM43	B0YM44	B0YM45	VBLKHK	VBLKHK BS
Sample Information	RFW#:	005	006	007	008	00LVH266-MB1	00LVH266-MB1
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOIL	SOIL
	D.F.:	105	1950	488	25.0	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
	Level:	MED	MED	MED	MED	MED	MED
Surrogate	1,2-Dichloroethane-d4	114 %	110 %	111 %	113 %	110 %	101 %
Recovery	Toluene-d8	98 %	98 %	99 %	97 %	100 %	87 %
	Bromofluorobenzene	97 %	96 %	96 %	97 %	99 %	84 %
Carbon Tetrachloride		2000000	0.20E+08	3700000	530000	620 U	620 U

\*= Outside of EPA CLP QC limits.





Bechtel Hanbrd Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-093-13		Page 1 of 1		
Collector R Fahlberg		Company Contact VJ Rohay		Telephone No. 372-9100		Project Coordinator TRENT, SJ		Price Code 9N Data Turnaround 45 Days		
Project Designation 200-ZP-2 Passive Soil Vapor Extraction - Other Solid		Sampling Location 200W		SAF No. B99-093		Air Quality <input type="checkbox"/>				
Ice Chest No. ERC 99.049		Field Logbook No. EL-1517		COA R20ZP2DP60		Method of Shipment Federal Express				
Shipped To TMA/RECRA 6.27.00		Offsite Property No. A000226		Bill of Lading/Air Bill No. 42357953-6839						
POSSIBLE SAMPLE HAZARDS/REMARKS NONE				Preservation		Cool 4C				
Special Handling and/or Storage				Type of Container		aG				
				No. of Container(s)		1				
				Volume		250mL				
SAMPLE ANALYSIS				VOA - 8260A (TCL) (Carbon tetrachloride)						
Sample No.	Matrix *	Sample Date	Sample Time							
BOYM46	OTHER SOLID	6.27.00	0945	X						
BOYM47	OTHER SOLID	6.27.00	0950	X						
BOYM48	OTHER SOLID	6.27.00	1000	X						
BOYM49	OTHER SOLID	6.27.00	1015	X						
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS				
Relinquished By R. Fahlberg		Date/Time 6.27.00		Received By R. Thoren		Date/Time 6/27/00 1:30		<p>** Laboratory may use medium level preparation for VOA. They are to report any other halogenated compounds found.</p> <p>** Laboratory must include the % Moisture data as part of all hard copy reports.</p> <p>Sample originated in non RAD controlled area. &lt;2000 PC1/g no TA Required</p> <p>(2C)</p>		<p>Matrix *</p> <p>S=Soil SE=Settlement SO=Solid S=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Time WJ=Wipe L=Liquid V=Vegetation X=Other</p>
Relinquished By R. Thoren		Date/Time 6/28/00 1430		Received By F. O. E. V.		Date/Time				
Relinquished By FedEx		Date/Time 6/29/00 0930		Received By Thoren		Date/Time 6/29/00 0930				
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				

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-093-12		Page 1 of 1	
Collector R Fahlberg		Company Contact VJ Rohay		Telephone No. 372-9100		Project Coordinator TRENT, SJ		Price Code 9N Date Turnaround 45 Days	
Project Designation 200-ZP-2 Passive Soil Vapor Extraction - Other Solid		Sampling Location 200W		SAF No. B99-093		Air Quality <input type="checkbox"/>			
Ice Chest No. ERC 99-049		Field Logbook No. EL-1517		COA R20ZP2DP60		Method of Shipment Federal Express			
Shipped To RF 6.27.00 TMA/RECRA		Offsite Property No. A000226		Bill of Lading/Air Bill No. 42357938-6839					
POSSIBLE SAMPLE HAZARDS/REMARKS  NONE				Preservation		Cool 4C			
				Type of Container		nG			
				No. of Container(s)		1			
				Special Handling and/or Storage		Volume		250mL	
SAMPLE ANALYSIS				VOA - B260A (TCL) (Carbon tetrachloride)					
Sample No.		Matrix *	Sample Date	Sample Time					
BOYM42		OTHER SOLID	6.27.00	0850	X				
BOYM43		OTHER SOLID	6.27.00	0905	X				
BOYM44		OTHER SOLID	6.27.00	0915	X				
BOYM45		OTHER SOLID	6.27.00	0930	X				
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS			
Relinquished By R Fahlberg		Date/Time 6/27/00 1130		Received By R. Thoren		** Laboratory may use medium level preparation for VOA. They are to report any other halogenated compounds found.			
Relinquished By R. Thoren		Date/Time 6/28/00 1430		Received By FED EX		** Laboratory must include the % Moisture data as part of all hard copy reports.			
Relinquished By Fedex		Date/Time 6/29/00 0930		Received By Thorpel		Sample originated in non Rad controlled area & wrapped 9 NO TA Required			
Relinquished By		Date/Time		Received By		(20)			
Relinquished By		Date/Time		Received By					
Relinquished By		Date/Time		Received By					
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	