



0059633

27 March 2003

Mr. Steve Trent  
Fluor Hanford Inc.  
825 Jadwin Ave.  
Richland, WA 99352

**Subject: Contract No. 630  
Analytical Data Package**

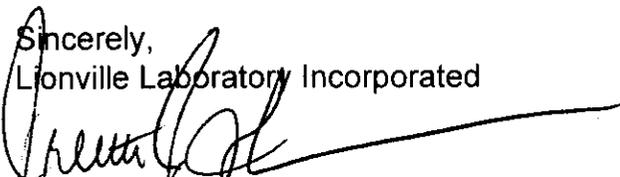


Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0302L799
SDG #	H2081
SAF #	F03-004
Date Received	2-21-03
# Samples	1
Matrix	Water
Volatiles	X
Semivolatiles	X
Pest/PCB	
DRO/GRO	
GC Alcohol	X
Metals	X
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,  
Lionville Laboratory Incorporated  
  
Orlette S. Johnson  
Project Manager

**RECEIVED**  
JUN 09 2003  
**EDMC**

Lionville Laboratory, Inc.  
VOA ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD F03-004 H2081

RFW LOT # :0302L799

CLIENT ID	RFW #	MTX	PREP #	COLLECTN DATE	REC	EXT/PREP	ANALYSIS
B16HC7	001	W	03LVX055	02/19/03	02/21/03	N/A	02/26/03
B16HC7	001 MS	W	03LVX055	02/19/03	02/21/03	N/A	02/26/03
B16HC7	001 MSD	W	03LVX055	02/19/03	02/21/03	N/A	02/26/03
LAB QC:							
VBLKJA	MB1	W	03LVX055	N/A	N/A	N/A	02/26/03
VBLKJA	MB1 BS	W	03LVX055	N/A	N/A	N/A	02/26/03

*ad*  
03-06-03





Client: TNU-HANFORD F03-004  
LVL #: 0302L799  
SDG/SAF # H2081/F03-004

W.O. #: 11343-606-001-9999-00  
Date Received: 02-21-2003

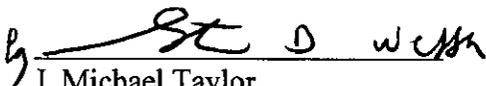
### GC/MS VOLATILE

One (1) water sample was collected on 02-19-2003.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL volatile target compounds on 02-26-2003.

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

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The required holding time for analysis was met.
3. Non-target compounds were not detected in the sample.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. One (1) of five (5) blank spike recoveries was outside EPA QC limits. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than 3x the CRQL.
8. Internal standard area and retention time criteria were met
9. Manual integrations are performed according to OP L-QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. "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  
President  
Lionville Laboratory Incorporated

03-17-03  
Date

som\group\data\voa\tnu-hanford\0302-799.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

### 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.

## 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.

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP** - Missed Peak: manually added peak not found by automatic quan program.
- PA** - Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



8

Cust ID: B16HC7 B16HC7 B16HC7 VBLKJA VBLKJA BS

RFW#: 001 001 MS 001 MSD 03LVX055-MB1 03LVX055-MB1

Chlorobenzene	5 U	101 %	100 %	5 U	107 %
Ethylbenzene	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U

\*= Outside of EPA CLP QC limits.



FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F03-004-20		Page 1 of 1				
Collector Fahlberg/Johansen/Thomas		Company Contact Steve Trent		Telephone No. 373-5869		Project Coordinator TRENT, SJ		Price Code 7N		Data Turnaround 45 Days				
Project Designation 200 Area Source Characterization 200-CS-1 OU - QC Sampli		Sampling Location B8828		SAF No. F03-004		Air Quality <input type="checkbox"/>								
Ice Chest No. ERC 01 024		Field Logbook No. HNF-N-3251		COA 117514ES10		Method of Shipment Federal Express								
Shipped To <del>BERLINE SERVICES (Formerly TMA)</del> <b>RECRA</b> Mb22003		Offsite Property No. A030134		Bill of Lading/Air Bill No. SEE OSC										
POSSIBLE SAMPLE HAZARDS/REMARKS				Preservation	HCl or H2SO4 to pH < 2 Cool	Cool 4C	HNO3 to pH < 2	H2SO4 to pH < 2 Cool 4C	Cool 4C	ZnAc+NaOH to pH > 9 Cool	HNO3 to pH < 2			
Special Handling and/or Storage				Type of Container	aGs*	aG	P	P	P	P	P			
				No. of Container(s)	3	2	2	1	1	1	2			
				Volume	40mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL			
SAMPLE ANALYSIS				VOA - 8260A (TCL); VOA - 8260A (Add- On) (1- Propanol, Ethanol)	Semi-VOA - 8270A (Add- On) (Tributyl phosphate)	See item (1) in Special Instructions.	NO2/NO3 - 353.2; Ammonia - 350.3	See item (2) in Special Instructions.	Sulfides - 9030	Gross Alpha; Gross Beta				
Sample No.	Matrix *	Sample Date	Sample Time											
B16HC7	WATER	2-19-03	1200	X	X	X	X	X	X	X				
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From		Date/Time 1300		Received By/Stored In		Date/Time 1300		<p>** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met. ** The laboratory is to analyze pH within 24 hours of sample receipt.</p> <p>(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc)</p> <p>(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040</p> <p>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</p> <p>Personnel not available to relinquish samples from the 3728 Ref # 3A on 2/20/03</p>				<p>S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other</p>		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
REF 3A 3728		22003 0830		SIOGAL		22003 0830								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
SIOGAL		22003 0830		FED EX										
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By		Title				Date/Time						
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time						

# LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hamford

Purchase Order/Project:

DATE: 2-21-03

SAF# / SOW# / Release #: F03-004

Laboratory SDG #:

03021799

**NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION**

- |  |   |  |   |   |
|--|---|--|---|---|
| 1. Custody seals on coolers or shipping container intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 2. Outside of coolers or shipping containers are free from damage?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 3. Airbill # recorded?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 5. Sample containers are intact?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 6. Custody seals on sample containers intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 7. All samples on coc received?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 8. All sample label information matches coc?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 10. Shipment meets LVL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)  | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | <input checked="" type="checkbox"/> see Comment # |
| 11. Where applicable, bar code labels are affixed to coc?  | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment #            |
| 12. coc signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 13. coc will be faxed or emailed to client?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date)   | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |

Cooler # / temp (°C) and Comments:

# ERC 01024/0.4°C

#1 pH out of hold.

Laboratory Sample Custodian:

*[Signature]*

Laboratory Project Manager:

10-

Lionville Laboratory, Inc.  
BNA ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD F03-004 H2081

DATE RECEIVED: 02/21/03

LVL LOT # :0302L799

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16HC7	001	W	03LE0203	02/19/03	02/24/03	03/13/03
B16HC7	001 MS	W	03LE0203	02/19/03	02/24/03	03/14/03
B16HC7	001 MSD	W	03LE0203	02/19/03	02/24/03	03/14/03

LAB QC:

SBLKNW	MB1	W	03LE0203	N/A	02/24/03	03/13/03
SBLKNW	MB1 BS	W	03LE0203	N/A	02/24/03	03/13/03





Client: TNU-HANFORD F03-004  
LVL #: 0302L799  
SDG/SAF # H2081/F03-004

W.O. #: 11343-606-001-9999-00  
Date Received: 02-21-2003

### SEMIVOLATILE

One (1) water sample was collected on 02-19-2003.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on method 3520 on 02-24-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compound Tributylphosphate on 03-13,14-2003.

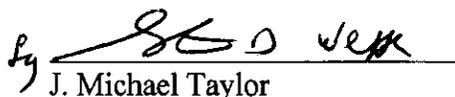
The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The sample was extracted and analyzed within required holding time.
3. All surrogate recoveries were within EPA QC limits.
4. 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 B/N spike recoveries have been reported on the Form 3.)

5. Internal standard area and retention time criteria were met.
6. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
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.

By   
J. Michael Taylor

President  
Lionville Laboratory Incorporated

03-18-03  
Date

som\gorup\data\bna\tnu-hanford-0302-799.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 11 pages.

02

## 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.

mmz\10-94\gloss.bna



## 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.

mmz\10-94\gloss.bna



## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP** - Missed Peak: manually added peak not found by automatic quan program.
- PA** - Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



## WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc.Contract: 1343-06-01Case No.: TNUHANFORD F03-004 H2081RFW Lot No.: 0302L799-001MATRIX Spike - Sample No.: B16HC7Level: (low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	MS CONCENTRATION UG/L	MS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	125	0	93.3	75	36 -97
N-Nitroso-Di-n-propylamine	125	0	91.3	73	41 -116
1,2,4-Trichlorobenzene	125	0	104	83	39 -98
Acenaphthene	125	0	101	81	46 -118
2,4-Dinitrotoluene	125	0	103	82	24 -96
Pyrene	125	0	126	101	26 -127

COMPOUND	SPIKE ADDED UG/L	MSD CONCENTRATION UG/L	MSD % REC #	% RPD #	QC LIMITS RPD	REC
1,4-Dichlorobenzene	128	101	79	5	28	36 -97
N-Nitroso-Di-n-propylamine	128	91.4	71	2	38	41 -116
1,2,4-Trichlorobenzene	128	113	88	5	28	39 -98
Acenaphthene	128	101	79	2	31	46 -118
2,4-Dinitrotoluene	128	102	80	2	38	24 -96
Pyrene	128	134	105	3	31	26 -127

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 6 outside limitsSpike Recovery: 0 out of 12 outside limits

COMMENTS:

3C  
WATER SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Lionville Labs, Inc.

Contract: 1343-06-01

Case No.: TNUHANFORD F03-004 H2081

RFW Lot No.: 0302L799

BLANK Spike - Sample No.: SBLKNWLE0203-MB1

Level: (low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	BS CONCENTRATION UG/L	BS % REC #	QC LIMITS REC
1,4-Dichlorobenzene	50.0	0	42.0	84	36 -97
N-Nitroso-Di-n-propylamine	50.0	0	41.0	82	41 -116
1,2,4-Trichlorobenzene	50.0	0	46.0	92	39 -98
Acenaphthene	50.0	0	43.2	86	46 -118
2,4-Dinitrotoluene	50.0	0	46.3	93	24 -96
Pyrene	50.0	0	47.8	96	26 -127

# Column to be used to flag recovery value with an asterisk  
\* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS:



FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F03-004-20		Page 1 of 1						
Collector Fahlberg/Johansen/Thomas		Company Contact Steve Trent		Telephone No. 373-5869		Project Coordinator TRENT, SJ		Price Code 7N		Data Turnaround 45 Days						
Project Designation 200 Area Source Characterization 200-CS-1 OU - QC Sampii		Sampling Location B8828		SAF No. F03-004		Air Quality <input type="checkbox"/>										
Ice Chest No. ERC 01 024		Field Logbook No. HNF-N-3251		COA 117514ES10		Method of Shipment Federal Express										
Shipped To RECRA <del>EBERLINE SERVICES (Formerly TMA)</del> Mb 22003		Offsite Property No. A030134		Bill of Lading/Air Bill No. SEE OSPC												
POSSIBLE SAMPLE HAZARDS/REMARKS																
Special Handling and/or Storage				Preservation	HCl or H2SO4 to pH < 2 Cool	Cool 4C	HNO3 to pH < 2	H2SO4 to pH < 2 Cool 4C	Cool 4C	ZnAc+NaOH to pH > 9 Cool	HNO3 to pH < 2					
				Type of Container	aGs*	aG	P	P	P	P	P					
				No. of Container(s)	3	2	2	1	1	1	1	2				
				Volume	40mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL					
SAMPLE ANALYSIS				VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	See item (1) in Special Instructions.	NO2/NO3 - 353.2; Ammonia - 350.3	See item (2) in Special Instructions.	Sulfides - 9030	Gross Alpha; Gross Beta						
Sample No.	Matrix *	Sample Date	Sample Time													
B16HC7	WATER	2-19-03	1200	X	X	X	X	X	X	X						
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met. ** The laboratory is to analyze pH within 24 hours of sample receipt.</p> <p>(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}</p> <p>(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040</p> <p>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</p> <p>Personnel not available to relinquish samples from the 3728 Ref # 3A on 2/20/03</p>				<p>S=Soil SE=Sediment SO=Solid SH=Shade W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other</p>				
REF ID KFA Libers		2-19-03		Ref 3A 3728		2-19-03										
REF 3A 3728		22003 0830		SIOGAL		22003 0830										
SIOGAL		22003 0830		FED EX												
KFA		2-2-03 0915		KFA		2-2-03 0915										
LABORATORY SECTION		Received By		Title		Date/Time										
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time										

# LIONVILLE LABORATORY INCORPORATED

## SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hartford

Purchase Order/Project:

DATE: 2.21.03

SAF# / SOW# / Release #: F03-004

Laboratory SDG #:

03021799

**NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION**

- |  |   |  |   |   |
|--|---|--|---|---|
| 1. Custody seals on coolers or shipping container intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 2. Outside of coolers or shipping containers are free from damage?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 3. Airbill # recorded?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 5. Sample containers are intact?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 6. Custody seals on sample containers intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 7. All samples on coc received?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 8. All sample label information matches coc?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)  | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | <input checked="" type="checkbox"/> see Comment # |
| 11. Where applicable, bar code labels are affixed to coc?  | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment #            |
| 12. coc signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 13. coc will be faxed or emailed to client?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date)   | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |

Cooler # / temp (°C) and Comments:

# ERC 01024/0.4°C

#1 pH out of hold.

Laboratory Sample Custodian:

Laboratory Project Manager:

*[Handwritten Signature]*

11

Lionville Laboratory, Inc.  
GCSC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD F03-004 H2081

DATE RECEIVED: 02/21/03

LVL LOT # :0302L799

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16HC7	001	W	03LE0252	02/19/03	03/06/03	03/06/03
B16HC7	001 MS	W	03LE0252	02/19/03	03/06/03	03/06/03
B16HC7	001 MSD	W	03LE0252	02/19/03	03/06/03	03/06/03

LAB QC:

BLK	MB1	W	03LE0252	N/A	03/06/03	03/06/03
BLK	MB1 BS	W	03LE0252	N/A	03/06/03	03/06/03
BLK	MB1 BSD	W	03LE0252	N/A	03/06/03	03/06/03

*Handwritten signature/initials*





## Analytical Report

Client: TNU HANFORD F03-004  
LVL#: 0302L799  
SDG/SAF#: H2081/F03-004

W.O.#: 11343-606-001-9999-00  
Date Received: 02-21-2003

### GC SCAN

One (1) water sample was collected on 02-19-2003.

The sample and its associated QC samples were analyzed on 03-06-2003 according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures based on method 8015B for n-Propyl Alcohol and Ethanol.

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

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. The sample was analyzed outside of holding time. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
3. The method blank was below the reporting limits for all target compounds.
4. Surrogates are not currently employed in the methodology.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. 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.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

  
Date

r:\group\data\gsc\tnu\0302-799.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 8 pages.

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 03GC076

Initiator: Boyle Santoro  
 Date: 3/21/03  
 Client: TNY

Batch: 0302L799  
 Samples: 001  
 Method: SW846/MCAWW/CLP1

Parameter: 06CSC  
 Matrix: Water  
 Prep Batch: 03LE0252

## 1. Reason for SDR

a. COC Discrepancy  Tech Profile Error  Client Request  Sampler Error on C-O-C  
 Transcription Error  Wrong Test Code  Other \_\_\_\_\_

### b. General Discrepancy

Missing Sample/Extract\*  Container Broken  Wrong Sample Pulled  Label ID's Illegible  
 Hold Time Exceeded  Insufficient Sample\*  Preservation Wrong  Received Past Hold  
 Improper Bottle Type  Not Amenable to Analysis

Note\*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: \_\_\_\_\_

### c. Problem (Include all relevant specific results; attach data if necessary)

(b) Sample was analyzed out of hold.

## 2. Known or Probable Causes(s)

## 3. Discussion and Proposed Action

Other Description: Narrative

Re-log  
 Entire Batch  
 Following Samples: \_\_\_\_\_  
 Re-leach  
 Re-extract  
 Re-digest  
 Revise EDD  
 Change Test Code to \_\_\_\_\_  
 Place On/Take Off Hold (circle)

[Signature] 3/21/03

## 4. Project Manager Instructions...signature/date:

Concur with Proposed Action  
 Disagree with Proposed Action; See Instruction  
 Include in Case Narrative  
 Client Contacted:  
 Date/Person \_\_\_\_\_  
 Add  
 Cancel

## 5. Final Action...signature/date:

Other Explanation:

Verified re-[log][leach][extract][digest][analysis] (circle)  
 Included in Case Narrative  
 Hard Copy COC Revised  
 Electronic COC Revised  
 EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

### Route Distribution of Completed SDR

Initiator  
 Lab General Manager: M. Taylor  
 Project Mgr: Stone/Johnson/Haslett  
 Technical Mgr: Wesson/Daniels  
 QA (file)  
 Data Management: Feldman  
 Sample Prep: Beegle/Kiger

### Route Distribution of Completed SDR

Metals: Beegle  
 Inorganic: Perrone  
 GC/LC: Kiger  
 MS: Rychlak/Layman  
 Log-in: Melnic  
 Admin: Soos  
 Other: \_\_\_\_\_

## GLOSSARY OF OGCS 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.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 03/21/03 14:08

RFW Batch Number: 0302L799

Client: TNUHANFORD F03-004 H2081 Work Order: 11343606001 Page: 1

	Cust ID:	B16HC7	B16HC7	B16HC7	BLK	BLK BS	BLK BSD
Sample	RFW#:	001	001 MS	001 MSD	03LE0252-MB1	03LE0252-MB1	03LE0252-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	99 %	103 %	5.0 U	98 %	99 %
Ethanol	5.0 U	100 %	100 %	5.0 U	98 %	98 %

*Handwritten signature/initials*

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





# LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hartford

Purchase Order/Project:

DATE: 2-21-03

SAF# / SOW# / Release #: F03-004

Laboratory SDG #:

03021799

**NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION**

- |  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No         | <input type="checkbox"/> N/A        | <input type="checkbox"/> see Comment # |
|--|---|-------------------------------------|-------------------------------------|--|
| 1. Custody seals on coolers or shipping container intact, signed and dated?  | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 2. Outside of coolers or shipping containers are free from damage?   | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 3. Airbill # recorded?   | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 5. Sample containers are intact?   | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 6. Custody seals on sample containers intact, signed and dated?  | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 7. All samples on coc received?  | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 8. All sample label information matches coc?   | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)   | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 10. Shipment meets LVLJ Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)  | <input type="checkbox"/>                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>    |
| 11. Where applicable, bar code labels are affixed to coc?  | <input type="checkbox"/>                | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>               |
| 12. coc signed and dated?  | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 13. coc will be faxed or emailed to client?  | <input checked="" type="checkbox"/>     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date)   | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>               |

Cooler # / temp (°C) and Comments:

# ERC 01024 / 0.4°

# 1 pH out of spec.

Laboratory Sample Custodian:

Laboratory Project Manager:

*[Signature]*

*[Signature]*



Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD F03-004 H2081

DATE RECEIVED: 02/21/03

LVL LOT # :0302L799

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B16HC7						
SILVER, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
SILVER, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
SILVER, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
ARSENIC, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
ARSENIC, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
ARSENIC, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
BARIUM, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
BARIUM, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
BARIUM, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
BERYLLIUM, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
BERYLLIUM, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
BERYLLIUM, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
CADMIUM, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
CADMIUM, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
CADMIUM, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
CHROMIUM, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
CHROMIUM, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
CHROMIUM, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
COPPER, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
COPPER, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
COPPER, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
NICKEL, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
NICKEL, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
NICKEL, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
LEAD, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
LEAD, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
LEAD, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
SELENIUM, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
SELENIUM, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
SELENIUM, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
VANADIUM, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
VANADIUM, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03
VANADIUM, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03
ZINC, TOTAL	001	W	03L0111	02/19/03	03/03/03	03/04/03
ZINC, TOTAL	001 REP	W	03L0111	02/19/03	03/03/03	03/04/03

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD F03-004 H2081

DATE RECEIVED: 02/21/03

LVL LOT # :0302L799

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	001 MS	W	03L0111	02/19/03	03/03/03	03/04/03

LAB QC:

SILVER LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
SILVER, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
ARSENIC LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
ARSENIC, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
BARIUM LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
BARIUM, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
BERYLLIUM LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
BERYLLIUM, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
CADMIUM LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
CADMIUM, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
CHROMIUM LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
CHROMIUM, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
COPPER LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
COPPER, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
NICKEL LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
NICKEL, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
LEAD LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
LEAD, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
SELENIUM LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
SELENIUM, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
VANADIUM LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
VANADIUM, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03
ZINC LABORATORY	LC1 BS	W	03L0111	N/A	03/03/03	03/04/03
ZINC, TOTAL	MB1	W	03L0111	N/A	03/03/03	03/04/03



## Analytical Report

---

**Client:** TNU-HANFORD F03-004  
**LVL#:** 0302L799  
**SDG/SAF#:** H2081/F03-004

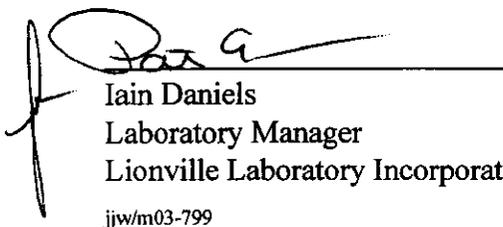
**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 02-21-03

### METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for sample discrepancies in LvLI's sample acceptance policy.
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 blanks for 2 analytes were 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 results for Barium and Zinc were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples 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 80-120% 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 14 pages.

11. The duplicate analyses for 5 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.
13. 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.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated  
jjw/m03-799

03-06-03  
Date

## METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0302L799

Leaching Procedure:   1310     1311     1312   Other: \_\_\_\_\_

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

Metals Digestion Methods:  3005A   3010A     3015     3020A     3050B     3051     200.7     SS17    
  Other: \_\_\_\_\_  

### Metals Analysis Methods

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

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, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

L-WI-033/N-04/98

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/05/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B16HC7	Silver, Total	0.80	u UG/L	0.80	1.0
		Arsenic, Total	3.5	u UG/L	3.5	1.0
		Barium, Total	0.41	UG/L	0.10	1.0
		Beryllium, Total	0.29	UG/L	0.10	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Chromium, Total	0.71	UG/L	0.60	1.0
		Copper, Total	3.3	UG/L	0.60	1.0
		Nickel, Total	1.8	u UG/L	1.8	1.0
		Lead, Total	2.6	u UG/L	2.6	1.0
		Selenium, Total	3.7	UG/L	3.6	1.0
		Vanadium, Total	0.21	UG/L	0.10	1.0
		Zinc, Total	12.4	UG/L	1.4	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/05/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK1	03L0111-MB1	Silver, Total	0.80 u	UG/L	0.80	1.0
		Arsenic, Total	3.5 u	UG/L	3.5	1.0
		Barium, Total	0.35	UG/L	0.10	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Cadmium, Total	0.40 u	UG/L	0.40	1.0
		Chromium, Total	0.60 u	UG/L	0.60	1.0
		Copper, Total	0.60 u	UG/L	0.60	1.0
		Nickel, Total	1.8 u	UG/L	1.8	1.0
		Lead, Total	2.6 u	UG/L	2.6	1.0
		Selenium, Total	3.6 u	UG/L	3.6	1.0
		Vanadium, Total	0.14	UG/L	0.10	1.0
		Zinc, Total	14.5	UG/L	1.4	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/05/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	SPIKED	INITIAL	SPIKED	%RECOV	DILUTION
			SAMPLE	RESULT	AMOUNT		FACTOR (SPK)
-001	B16HC7	Silver, Total	51.0	0.80u	50.0	102.0	1.0
		Arsenic, Total	1990	3.5 u	2000	99.5	1.0
		Barium, Total	2010	0.41	2000	100.4	1.0
		Beryllium, Total	49.6	0.29	50.0	98.6	1.0
		Cadmium, Total	50.5	0.40u	50.0	101.0	1.0
		Chromium, Total	204	0.71	200	101.5	1.0
		Copper, Total	256	3.3	250	101.2	1.0
		Nickel, Total	501	1.8 u	500	100.2	1.0
		Lead, Total	501	2.6 u	500	100.2	1.0
		Selenium, Total	1990	3.7	2000	99.5	1.0
		Vanadium, Total	506	0.21	500	101.1	1.0
		Zinc, Total	512	12.4	500	99.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/05/03

CLIENT: TNUHANFORD F03-004 H2081

LVL LOT #: 0302L799

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	B16HC7	Silver, Total	0.80u	1.0	NC <i>200 MW 3/5/03</i>	1.0
		Arsenic, Total	3.5 u	3.5 u	NC <i>200 MW 3/5/03</i>	1.0
		Barium, Total	0.41	0.45	9.3	1.0
		Beryllium, Total	0.29	0.18	46.8	1.0
		Cadmium, Total	0.40u	0.40u	NC	1.0
		Chromium, Total	0.71	1.5	71.5	1.0
		Copper, Total	3.3	2.7	20.0	1.0
		Nickel, Total	1.8 u	1.8 u	NC	1.0
		Lead, Total	2.6 u	2.6 u	NC	1.0
		Selenium, Total	3.7	3.6 u	<i>200 MW 3/5/03</i>	1.0
		Vanadium, Total	0.21	0.66	103.4	1.0
		Zinc, Total	12.4	10.8	13.8	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/05/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RSCOV
			SAMPLE	AMOUNT		
-----	-----	-----	-----	-----	-----	-----
LCS1	03L0111-LC1	Silver, LCS	498	500	UG/L	99.6
		Arsenic, LCS	9840	10000	UG/L	98.4
		Barium, LCS	4980	5000	UG/L	99.5
		Beryllium, LCS	245	250	UG/L	98.0
		Cadmium, LCS	248	250	UG/L	99.2
		Chromium, LCS	500	500	UG/L	99.9
		Copper, LCS	1250	1250	UG/L	100
		Nickel, LCS	1990	2000	UG/L	99.3
		Lead, LCS	2470	2500	UG/L	98.8
		Selenium, LCS	9980	10000	UG/L	99.8
		Vanadium, LCS	2510	2500	UG/L	100.4
		Zinc, LCS	1000	1000	UG/L	100.4



FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F03-004-20						
Collector Fahlberg/Johansen/Thomas		Company Contact Steve Trent		Telephone No. 373-5869		Project Coordinator TRENT, SJ		Price Code 7N	Data Turnaround 45 Days					
Project Designation 200 Area Source Characterization 200-CS-1 OU - QC Sampli		Sampling Location B8828		SAF No. F03-004		Air Quality <input type="checkbox"/>								
Ice Chest No. ERC 01 024		Field Logbook No. HNF-N-3251		COA 117514ES10		Method of Shipment Federal Express								
Shipped To RECRA EDERLINE SERVICES (Formerly TMA) 4/6/22003		Offsite Property No. A030134		Bill of Lading/Air Bill No. SEE OSPC										
POSSIBLE SAMPLE HAZARDS/REMARKS				Preservation	HCl or H2SO4 to pH <2 Cool	Cool 4C	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	ZnAc+NaOH to pH >9 Cool	HNO3 to pH <2			
Special Handling and/or Storage				Type of Container	aGs*	aG	P	P	P	P	P			
				No. of Container(s)	3	2	2	1	1	1	2			
				Volume	40mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL			
SAMPLE ANALYSIS				VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	See item (1) in Special Instructions.	NO2/NO3 - 353.2; Ammonia - 350.3	See item (2) in Special Instructions.	Sulfides - 9030	Gross Alpha; Gross Beta				
Sample No.	Matrix *	Sample Date	Sample Time											
B16HC7	WATER	2-19-03	1200	X	X	X	X	X	X	X				
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From RFEDL KFA Jhb 2-19-03		Date/Time 1300		Received By/Stored In Ref 3A 3728		Date/Time 1300		<p>** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met. ** The laboratory is to analyze pH within 24 hours of sample receipt.</p> <p>(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc)</p> <p>(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040</p> <p>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</p> <p>Personnel not available to relinquish samples from the 3728 Ref # 3A on 2/20/03</p>				<p>S=Soil SE=Soil/est SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wt=Wipe L=Liquid V=Vegetation X=Other</p>		
Relinquished By/Removed From RF 3A 3728		Date/Time 22003 0830		Received By/Stored In SIGALE Mch		Date/Time 22003 0830								
Relinquished By/Removed From ENCALE A Jhb		Date/Time 22003 0830		Received By/Stored In FED EX		Date/Time								
Relinquished By/Removed From KEDICV		Date/Time 2-2-03 0915		Received By/Stored In JL Mich		Date/Time 2-2-03 0915								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By		Title		Date/Time								
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time								

13

# LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hartford

Purchase Order/Project:

DATE: 2-21-03

SAF# / SOW# / Release #: F03-004

Laboratory SDG #:

03021799

**NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION**

- |  |   |  |   |   |
|--|---|--|---|---|
| 1. Custody seals on coolers or shipping container intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 2. Outside of coolers or shipping containers are free from damage?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 3. Airbill # recorded?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 5. Sample containers are intact?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 6. Custody seals on sample containers intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 7. All samples on coc received?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 8. All sample label information matches coc?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 10. Shipment meets LVLJ Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)  | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | <input checked="" type="checkbox"/> see Comment # |
| 11. Where applicable, bar code labels are affixed to coc?  | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment #            |
| 12. coc signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 13. coc will be faxed or emailed to client?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date)   | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |

Cooler # / temp (°C) and Comments:

# ERC 01024 / 0.4°C

#1 pH out of hold

Laboratory Sample Custodian:

*[Signature]*

Laboratory Project Manager:



Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD F03-004 H2081

DATE RECEIVED: 02/21/03

LVL LOT # :0302L799

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
B16HC7							
CHLORIDE BY IC	001	W	03LICB14	02/19/03	02/27/03	02/27/03	
CHLORIDE BY IC	001 REP	W	03LICB14	02/19/03	02/27/03	02/27/03	
CHLORIDE BY IC	001 MS	W	03LICB14	02/19/03	02/27/03	02/27/03	
FLUORIDE BY IC	001	W	03LICCC14	02/19/03	02/27/03	02/27/03	
FLUORIDE BY IC	001 REP	W	03LICCC14	02/19/03	02/27/03	02/27/03	
FLUORIDE BY IC	001 MS	W	03LICCC14	02/19/03	02/27/03	02/27/03	
NITRITE BY IC	001	W	03LICE14	02/19/03	02/27/03	02/27/03	2217
NITRITE BY IC	001 REP	W	03LICE14	02/19/03	02/27/03	02/27/03	2226
NITRITE BY IC	001 MS	W	03LICE14	02/19/03	02/27/03	02/27/03	2236
NITRATE BY IC	001	W	03LICD14	02/19/03	02/27/03	02/27/03	2217
NITRATE BY IC	001 REP	W	03LICD14	02/19/03	02/27/03	02/27/03	2226
NITRATE BY IC	001 MS	W	03LICD14	02/19/03	02/27/03	02/27/03	2236
PHOSPHATE BY IC	001	W	03LICD14	02/19/03	02/27/03	02/27/03	2217
PHOSPHATE BY IC	001 REP	W	03LICD14	02/19/03	02/27/03	02/27/03	2226
PHOSPHATE BY IC	001 MS	W	03LICD14	02/19/03	02/27/03	02/27/03	2236
SULFATE BY IC	001	W	03LICA14	02/19/03	02/27/03	02/27/03	
SULFATE BY IC	001 REP	W	03LICA14	02/19/03	02/27/03	02/27/03	
SULFATE BY IC	001 MS	W	03LICA14	02/19/03	02/27/03	02/27/03	
NITRATE NITRITE	001	W	03LN3A14	02/19/03	03/07/03	03/07/03	
NITRATE NITRITE	001 REP	W	03LN3A14	02/19/03	03/07/03	03/07/03	
NITRATE NITRITE	001 MS	W	03LN3A14	02/19/03	03/07/03	03/07/03	
AMMONIA	001	W	03LAM007	02/19/03	02/26/03	02/26/03	
AMMONIA	001 REP	W	03LAM007	02/19/03	02/26/03	02/26/03	
AMMONIA	001 MS	W	03LAM007	02/19/03	02/26/03	02/26/03	
PH	001	W	03LPH014	02/19/03	02/25/03	02/25/03	1624
PH	001 REP	W	03LPH014	02/19/03	02/25/03	02/25/03	1626
SULFIDE	001	W	03LSD006	02/19/03	02/26/03	02/26/03	
SULFIDE	001 REP	W	03LSD006	02/19/03	02/26/03	02/26/03	

LAB QC:

CHLORIDE BY IC	MB1	W	03LICB14	N/A	02/27/03	02/27/03
CHLORIDE BY IC	MB1 BS	W	03LICB14	N/A	02/27/03	02/27/03
FLUORIDE BY IC	MB1	W	03LICCC14	N/A	02/27/03	02/27/03
FLUORIDE BY IC	MB1 BS	W	03LICCC14	N/A	02/27/03	02/27/03

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD F03-004 H2081

DATE RECEIVED: 02/21/03

LVL LOT # :0302L799

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRITE BY IC	MB1	W	03LICE14	N/A	02/27/03	02/27/03
NITRITE BY IC	MB1 BS	W	03LICE14	N/A	02/27/03	02/27/03
NITRATE BY IC	MB1	W	03LICD14	N/A	02/27/03	02/27/03
NITRATE BY IC	MB1 BS	W	03LICD14	N/A	02/27/03	02/27/03
PHOSPHATE BY IC	MB1	W	03LICD14	N/A	02/27/03	02/27/03
PHOSPHATE BY IC	MB1 BS	W	03LICD14	N/A	02/27/03	02/27/03
SULFATE BY IC	MB1	W	03LICA14	N/A	02/27/03	02/27/03
SULFATE BY IC	MB1 BS	W	03LICA14	N/A	02/27/03	02/27/03
NITRATE NITRITE	MB1	W	03LN3A14	N/A	03/07/03	03/07/03
NITRATE NITRITE	MB1 BS	W	03LN3A14	N/A	03/07/03	03/07/03
AMMONIA	MB1	W	03LAM007	N/A	02/26/03	02/26/03
AMMONIA	MB1 BS	W	03LAM007	N/A	02/26/03	02/26/03
AMMONIA	MB1 BSD	W	03LAM007	N/A	02/26/03	02/26/03
SULFIDE	MB1	W	03LSD006	N/A	02/26/03	02/26/03
SULFIDE	MB1 BS	W	03LSD006	N/A	02/26/03	02/26/03
SULFIDE	MB1 BSD	W	03LSD006	N/A	02/26/03	02/26/03



## Analytical Report

**Client:** TNU-HANFORD F03-004 H2081  
**LVL#:** 0302L799

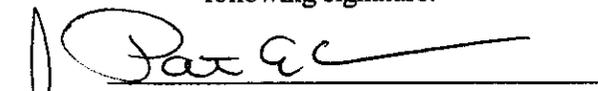
**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 02-21-03

### INORGANIC 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 that was received past hold and Nitrate, Nitrite and Phosphate that were analyzed past hold (see the sample chronology summary for analyses times for short hold samples).
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy with the exception of pH as noted on the Sample Receipt Checklist.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia and Sulfide were within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries for Chloride, Fluoride, Nitrate Nitrite, Phosphate, Sulfate Nitrate Nitrite and Ammonia were within the 75-125% control limits.
8. The replicate analyses for Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate, Nitrate Nitrite, Ammonia, pH and Sulfide were within the 20% RPD control limit.

Insufficient sample volume was provided so as to perform both replicate and matrix spike analyses for Sulfide.

9. 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 package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
\_\_\_\_\_  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated  
njpl02-799

03-18-03  
Date

The results presented in this report relate to the analytical testing and conditions of the samples upon 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 13 pages.

Lionville Laboratory Incorporated

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"/> Nitrate <input checked="" type="checkbox"/> Nitrite <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	<input checked="" type="checkbox"/> 425.1		
<input checked="" type="checkbox"/> Nitrate-Nitrite ___ Nitrate ___ Nitrite	<input checked="" type="checkbox"/> 353.2		
Ammonia	350.3		
Total ___ Kjeldahl ___ Organic Nitrogen	351.3		
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
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	160.5		
Sulfide	376.1		<input checked="" type="checkbox"/> 9030B/9034 (acid soluble)
Reactive ___ Cyanide ___ Sulfide		___ Section 7.3	(___ 9014 ___ 9030B)
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:	

## Lionville Laboratory Incorporated

### 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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/11/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B16HC7	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	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	0.25 u	MG/L	0.25	1.0
		Nitrate Nitrite	0.020u	MG/L	0.020	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
		pH	5.8	PH UNIT	0.01	1.0
		Sulfide	1.0 u	MG/L	1.0	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/11/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK10	03LICB14-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
BLANK10	03LICCC14-MB1	Fluoride by IC	0.25 u	MG/L	0.25	1.0
BLANK10	03LICB14-MB1	Nitrite by IC	0.25 u	MG/L	0.25	1.0
BLANK10	03LICD14-MB1	Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	03LICA14-MB1	Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	03LN3A14-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	03LAM007-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0
BLANK10	03LSD006-MB1	Sulfide	1.0 u	MG/L	1.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/11/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B16HC7	Chloride by IC	5.2	0.24	5.0	98.5	1.0
		Fluoride by IC	5.4	0.00	5.0	108.5	1.0
		Nitrite by IC	5.16	0.25u	5.00	103.2	1.0
		Nitrate by IC	5.04	0.25u	5.00	100.9	1.0
		Phosphate by IC	5.2	0.25u	5.0	103.0	1.0
		Sulfate by IC	5.1	0.25u	5.0	102.2	1.0
		Nitrate Nitrite	0.52	0.02u	0.50	104.8	1.0
		Ammonia, as N	2.0	0.10u	2.0	100.5	1.0
BLANK10	03LICB14-MB1	Chloride by IC	4.7	0.25u	5.0	94.6	1.0
BLANK10	03LICC14-MB1	Fluoride by IC	5.1	0.25u	5.0	101.4	1.0
BLANK10	03LICR14-MB1	Nitrite by IC	4.91	0.25u	5.00	98.1	1.0
BLANK10	03LICD14-MB1	Nitrate by IC	4.74	0.25u	5.00	94.7	1.0
		Phosphate by IC	5.6	0.25u	5.0	111.2	1.0
BLANK10	03LICA14-MB1	Sulfate by IC	4.8	0.25u	5.0	95.8	1.0
BLANK10	03LN3A14-MB1	Nitrate Nitrite	0.52	0.02u	0.50	103.4	1.0
BLANK10	03LAM007-MB1	Ammonia, as N	2.0	0.10u	2.0	99.0	1.0
		Ammonia, as N MSD	2.0	0.10u	2.0	98.0	1.0
BLANK10	03LSD006-MB1	Sulfide	11.4	1.0 u	11.5	98.8	1.0
		Sulfide MSD	11.3	1.0 u	11.5	98.0	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 03/11/03

CLIENT: TNUHANFORD F03-004 H2081  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	03LAM007-MB1	Ammonia, as N	99.0	98.0	1.0
BLANK10	03LSD006-MB1	Sulfide	98.8	98.0	0.88

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/11/03

CLIENT: TNUHANFORD F03-004 H2081  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0302L799

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
-001REP	B16HC7	Chloride by IC	0.25u	0.25u	NC	1.0
		Fluoride by IC	0.25u	0.25u	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	0.25u	0.25u	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	0.9	1.0
		Sulfide	1.0 u	1.0 u	NC	1.0



<b>FH-Central Plateau Project</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>			F03-004-20	Page 1 of 1
Collector Fahlberg/Johansen/Thomas	Company Contact Steve Trent	Telephone No. 373-5869	Project Coordinator TRENT, SJ		Price Code 7N	Data Turnaround 45 Days
Project Designation 200 Area Source Characterization 200-CS-1 OU - QC Sampli		Sampling Location B8828	SAF No. F03-004		Air Quality <input type="checkbox"/>	
Ice Chest No. ERC 01 024	Field Logbook No. HNF-N-3251	COA 117514ES10	Method of Shipment Federal Express			
Shipped To RECRA EDERLINE SERVICES (Formerly TMA) Mb 22003		Offsite Property No. A030134	Bill of Lading/Air Bill No. SEE OSPC			

Special Handling and/or Storage	Preservation	HCl or H2SO4 to pH <2 Cool	Cool 4C	HNO3 to pH <2	H2SO4 to pH <2 Cool 4C	Cool 4C	ZnAc+NaOH to pH >9 Cool	HNO3 to pH <2		
	Type of Container	aGs*	aG	P	P	P	P	P		
	No. of Container(s)	3	2	2	1	1	1	2		
	Volume	40mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL		
<b>SAMPLE ANALYSIS</b>		VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	See item (1) in Special Instructions.	NO2/NO3 - 353.2; Ammonia - 350.3	See item (2) in Special Instructions.	Sulfides - 9030	Gross Alpha; Gross Beta		
Sample No.	Matrix *	Sample Date	Sample Time							
B16HC7	WATER	2-19-03	1200	X	X	X	X	X		

<b>CHAIN OF POSSESSION</b>		<b>Sign/Print Names</b>		<b>SPECIAL INSTRUCTIONS</b>				<b>Matrix *</b>
Relinquished By/Removed From REF 3A 3728 22003 0830	Date/Time 2-19-03 0830	Received By/Stored In SIOGALE	Date/Time 22003 0830	** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met. ** The laboratory is to analyze pH within 24 hours of sample receipt.				S=Soil SE=Soil near SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From SIOGALE	Date/Time 22003 0830	Received By/Stored In FED EX	Date/Time	(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc)				
Relinquished By/Removed From KYOICV	Date/Time 2-2-03 0915	Received By/Stored In D. Miller	Date/Time 2-2-03 0915	(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Samples did not originate in radiological controlled area. No total activity associated with sample/samples.				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Personnel not available to relinquish samples from the 3728 Ref # 3A on 2-12-03				

<b>LABORATORY SECTION</b>	Received By	Title	Date/Time
<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method	Disposed By	Date/Time

# LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: TNU Hamford

Purchase Order/Project:

DATE: 2-21-03

SAF# / SOW# / Release #: F03-004

Laboratory SDG #:

03021799

**NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION**

- |  |   |  |   |   |
|--|---|--|---|---|
| 1. Custody seals on coolers or shipping container intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 2. Outside of coolers or shipping containers are free from damage?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 3. Airbill # recorded?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 5. Sample containers are intact?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 6. Custody seals on sample containers intact, signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 7. All samples on coc received?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 8. All sample label information matches coc?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)  | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | <input checked="" type="checkbox"/> see Comment # |
| 11. Where applicable, bar code labels are affixed to coc?  | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment #            |
| 12. coc signed and dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 13. coc will be faxed or emailed to client?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date)   | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #            |

Cooler # / temp (°C) and Comments:

# ERC 01024 / 0.4°C

#1 pH out of hold

Laboratory Sample Custodian:

*[Signature]*

Laboratory Project Manager:



**EBERLINE**  
SERVICES

April 4, 2003

Mr. Steve Trent  
Fluor Hanford Inc.  
825 Jadwin Avenue  
Richland, WA 99352



Reference: **P.O. #630**  
**Eberline Services R3-02-109-7446, SDG H2081**

Dear Mr. Trent:

Enclosed is the data report for one water sample designated under SAF No. F03-004 received at Eberline Services on February 21, 2003. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Program Manager

MCM

Enclosure: Data Package

Analytical Services  
2030 Wright Avenue  
P.O. Box 4040  
Richmond, California 94804-0040  
(510) 235-2633 Fax (510) 235-0438  
Toll Free (800) 841-5487  
[www.eberlineservices.com](http://www.eberlineservices.com)

**1.0 GENERAL**

Fluor Hanford Inc. (FH) Sample Delivery Group H2081 was composed of one water sample designated under SAF No. F03-004 with a Project Designations of: 200 Area Source Characterization 200-CS-1 OU – QC Sampling.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

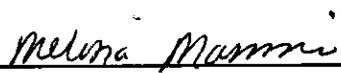
**2.0 ANALYSIS NOTES**

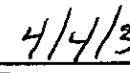
**2.1 Gross Alpha and Gross Beta Analyses**

No problems were encountered during the course of the analyses.

**Case Narrative Certification Statement**

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

  
\_\_\_\_\_  
**Melissa C. Mannion**  
**Program Manager**

  
\_\_\_\_\_  
**Date**

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H2081

SDG 7446  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_H2081

S U M M A R Y   D A T A   S E C T I O N

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Melissa Mannion  
Prepared by

Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 04/04/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2081

SDG 7446  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H2081

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 04/04/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2081

SDG 7446  
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford  
Contract No. 630  
Case no SDG\_H2081

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

**EBERLINE SERVICES/RICHMOND**  
 SAMPLE DELIVERY GROUP H2081

SDG 7446  
 Contact Melissa C. Mannion

**LAB SAMPLE SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H2081

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R302109-01	B16HC7	B8828	WATER		F03-004	F03-004-20	02/19/03 12:00
R302109-02	Lab Control Sample		WATER		F03-004		
R302109-03	Method Blank		WATER		F03-004		
R302109-04	Duplicate (R302109-01)	B8828	WATER		F03-004		02/19/03 12:00

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LS  
 Version 3.06  
 Report date 04/04/03

**EBERLINE SERVICES/RICHMOND**  
 SAMPLE DELIVERY GROUP H2081

SDG 7446  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H2081

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7446	F03-004-20	B16HC7	WATER		2.0 L		02/21/03 2	R302109-01	7446-001
		Method Blank	WATER					R302109-03	7446-003
		Lab Control Sample	WATER					R302109-02	7446-002
		Duplicate (R302109-01)	WATER		2.0 L		02/21/03 2	R302109-04	7446-004

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 04/04/03

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H2081

SDG 7446  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H2081

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALIFIERS
			BATCH	2σ %	CLIENT	MORE	RE BLANK	LCS	
Gas Proportional Counting									
93A	WATER	Gross Alpha in Water	7043-113	20.0	1		1	1	1/1
93B	WATER	Gross Beta in Water	7043-113	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 EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-PBS  
 Version 3.06  
 Report date 04/04/03

**EBERLINE SERVICES/RICHMOND**  
**SAMPLE DELIVERY GROUP H2081**

SDG 7446  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Case no SDG H2081

**LAB WORK SUMMARY**

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R302109-01 02/19/03 02/21/03	B16HC7 88828 F03-004-20	F03-004		7446-001 7446-001	93A/93 93B/93		03/28/03 03/28/03	04/04/03 04/04/03	MCM MCM	Gross Alpha in Water Gross Beta in Water
R302109-02	Lab Control Sample			7446-002 7446-002	93A/93 93B/93		03/31/03 03/28/03	04/04/03 04/04/03	MCM MCM	Gross Alpha in Water Gross Beta in Water
		F03-004								
R302109-03	Method Blank			7446-003 7446-003	93A/93 93B/93		03/28/03 03/28/03	04/04/03 04/04/03	MCM MCM	Gross Alpha in Water Gross Beta in Water
		F03-004								
R302109-04 02/19/03 02/21/03	Duplicate (R302109-01) 88828	F03-004		7446-004 7446-004	93A/93 93B/93		03/28/03 03/28/03	04/04/03 04/04/03	MCM MCM	Gross Alpha in Water Gross Beta in Water

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	F03-004	Gross Alpha in Water	900.0_ALPHABETA_GPC	1			1	1	1		4
93B/93	F03-004	Gross Beta in Water	900.0_ALPHABETA_GPC	1			1	1	1		4
<b>TOTALS</b>				<b>2</b>			<b>2</b>	<b>2</b>	<b>2</b>		<b>8</b>

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 04/04/03

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H2081

7446-003

Method Blank

METHOD BLANK

SDG <u>7446</u>	Client/Case no <u>Hanford</u>	<u>SDG_H2081</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R302109-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7446-003</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>F03-004</u>	

ANALYTE	CAS NO	RESULT pCi/L	2 $\sigma$ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.172	0.46	0.81	3.0	U	93A
Gross Beta	12587-47-2	-0.304	1.1	1.9	4.0	U	93B

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 44158
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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/04/03</u>



**EBERLINE SERVICES/RICHMOND**  
**SAMPLE DELIVERY GROUP H2081**

7446-004

B16HC7

**DUPLICATE**

SDG <u>7446</u>	Client/Case no <u>Hanford</u>	<u>SDG H2081</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
<b>DUPLICATE</b>	<b>ORIGINAL</b>	
Lab sample id <u>R302109-04</u>	Lab sample id <u>R302109-01</u>	Client sample id <u>B16HC7</u>
Dept sample id <u>7446-004</u>	Dept sample id <u>7446-001</u>	Location/Matrix <u>B8828</u> <u>WATER</u>
	Received <u>02/21/03</u>	Collected/Volume <u>02/19/03 12:00</u> <u>2.0 L</u>
		Custody/SAF No <u>F03-004-20</u> <u>F03-004</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	0.102	0.46	0.87	3.0	U	93A	-0.264	0.36	0.84	U	-	-
Gross Beta	-0.257	1.5	2.6	4.0	U	93B	0.838	1.1	1.8	U	-	-

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 44159

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H2081

7446-001

B16HC7

DATA SHEET

SDG <u>7446</u>	Client/Case no <u>Hanford</u>	SDG <u>H2081</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R302109-01</u>	Client sample id <u>B16HC7</u>	
Dept sample id <u>7446-001</u>	Location/Matrix <u>B8828</u>	<u>WATER</u>
Received <u>02/21/03</u>	Collected/Volume <u>02/19/03 12:00</u>	<u>2.0 L</u>
	Custody/SAF No <u>F03-004-20</u>	<u>F03-004</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.264	0.36	0.84	3.0	U	93A
Gross Beta	12587-47-2	0.838	1.1	1.8	4.0	U	93B

200 Area Source Chara. 200-CS-1 OU

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/04/03</u>

DATA SHEETS

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SUMMARY DATA SECTION

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2081

Test 93A Matrix WATER  
 SDG 7446  
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS ALPHA IN WATER  
 GAS PROPORTIONAL COUNTING

Client Hanford  
 Contract No. 630  
 Contract SDG H2081

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Gross Alpha
Preparation batch 7043-113					
R302109-01	93	7446-001	B16HC7		U
R302109-02	93	7446-002	LCS (QC ID=44157)		ok
R302109-03	93	7446-003	BLK (QC ID=44158)		U
R302109-04	93	7446-004	Duplicate (R302109-01)		- U

Nominal values and limits from method RDLs (pCi/L) 3.0  
 200 Area Source Chara. 200-CS-1 OU

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-	
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD PREPARED	YZED	DETECTOR
Preparation batch 7043-113 2σ prep error 20.0 % Reference Lab Notebook 7043 pg. 113														
R302109-01	93	B16HC7	0.84	0.300			<u>1</u>	100				37	03/28/03	03/28 GRB-109
R302109-02	93	LCS (QC ID=44157)	1.2	0.300			23	100					03/28/03	03/31 GRB-115
R302109-03	93	BLK (QC ID=44158)	0.81	0.300			22	100					03/28/03	03/28 GRB-111
R302109-04	93	Duplicate (R302109-01) (QC ID=44159)	0.87	0.300			<u>1</u>	100				37	03/28/03	03/28 GRB-114

Nominal values and limits from method 3.0 0.300 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 CP-120 Gross Alpha and Gross Beta in Water, rev 5

AVERAGES ± 2 SD MDA 0.93 ± 0.36  
 FOR 4 SAMPLES RESIDUE 12 ± 25

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 04/04/03

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H2081

Test 93B Matrix WATER  
 SDG 7446  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

GROSS BETA IN WATER  
 GAS PROPORTIONAL COUNTING

Client Hanford  
 Contract No. 630  
 Contract SDG H2081

**RESULTS**

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

Preparation batch 7043-113

R302109-01	93	7446-001	B16HC7		U
R302109-02	93	7446-002	LCS (QC ID=44157)		ok
R302109-03	93	7446-003	BLK (QC ID=44158)		U
R302109-04	93	7446-004	Duplicate (R302109-01)	-	U

Nominal values and limits from method      RDLs (pCi/L)      4.0  
 200 Area Source Chara. 200-CS-1 OU

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 7043-113      2σ prep error 15.0 %      Reference Lab Notebook 7043 pg. 113

R302109-01	93	B16HC7	1.8	0.300			<u>1</u>		100			37 03/28/03	03/28 GRB-109
R302109-02	93	LCS (QC ID=44157)	2.2	0.300			23		100			03/28/03	03/28 GRB-110
R302109-03	93	BLK (QC ID=44158)	1.9	0.300			22		100			03/28/03	03/28 GRB-111
R302109-04	93	Duplicate (R302109-01) (QC ID=44159)	2.6	0.300			<u>1</u>		100			37 03/28/03	03/28 GRB-114

Nominal values and limits from method      4.0      0.300      5-250      100      180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 CP-120 Gross Alpha and Gross Beta in Water, rev 5

AVERAGES ± 2 SD      MDA 2.1 ± 0.72  
 FOR 4 SAMPLES      RESIDUE 12 ± 25

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 04/04/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2081

SDG 7446  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H2081

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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SUMMARY DATA SECTION

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Lab id EBRLNE  
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Version Ver 1.0  
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2081

SDG 7446  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H2081

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.

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H2081

SDG 7446  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG H2081

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 EBRLNE  
 Protocol Hanford  
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2081

SDG 7446  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG H2081

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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SDG 7446  
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
 Contract No. 630  
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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.

REPORT GUIDES

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SUMMARY DATA SECTION

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GUIDE, cont.

Client Hanford  
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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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SDG 7446  
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REPORT GUIDE

Client Hanford  
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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.

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SAMPLE DELIVERY GROUP H2081

SDG 7446  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
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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.

REPORT GUIDES

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SUMMARY DATA SECTION

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 Protocol Hanford  
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 Report date 04/04/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2081

SDG 7446  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H2081

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.

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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

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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.

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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'

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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.

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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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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.

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FH-Central Plateau Project				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F03-004-20		Page 1 of 1			
Collector Fahlberg/Johansen/Thomas				Company Contact Steve Trent		Telephone No. 373-5869		Project Coordinator TRENT, SJ		Price Code 7N		Data Turnaround 45 Days			
Project Designation 200 Area Source Characterization 200-CS-1 OU - QC Sampli				Sampling Location B8828		H2081 (7446)		SAF No. F03-004		Air Quality <input type="checkbox"/>					
Ice Chest No. ERC 02 506				Field Logbook No. HNF-N-3251		COA 117514ES10		Method of Shipment Federal Express							
Shipped To EBERLINE SERVICES (Formerly TMA)				Offsite Property No. A030152		Bill of Lading/Air Bill No. SEE OSPC									
POSSIBLE SAMPLE HAZARDS/REMARKS  Special Handling and/or Storage				Preservation	HCl or H2SO4 to pH < 2	Cool 4C	HNO3 to pH < 2	H2SO4 to pH < 2 Cool 4C	Cool 4C	ZnAc+NaOH to pH > 7 Cool	HNO3 to pH < 2				
				Type of Container	aGs*	aG	P	P	P	P	P				
				No. of Container(s)	3	2	2	1	1	1	1	2			
				Volume	40mL	1000mL	1000mL	1000mL	1000mL	500mL	1000mL				
SAMPLE ANALYSIS				VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Semi-VOA - 8270A (Add-On) (Tributyl phosphate)	See item (1) in Special Instructions.	NO2/NO3 - 357.2; Ammonia - 350.3	See item (2) in Special Instructions.	Sulfides - 9030	Gross Alpha; Gross Beta					
Sample No.	Matrix *	Sample Date	Sample Time												
B16HC7	WATER	2-19-03	1200	X	X	X	X	X	X	X					
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>** Fluor Hanford acknowledges that the analytical holding time for Nitrate by EPA Method 300.0 or method 9056 will not be met. ** The laboratory is to analyze pH within 24 hours of sample receipt.</p> <p>(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc)</p> <p>(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040</p> <p>Samples did not originate in radiological controlled area. No total activity associated with sample/samples.</p> <p>Personnel not available to relinquish samples from the 3728 Ref # 3A on 2/20/03</p>				<p>S=Soil SE=Soilment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other</p>			
REF 3A 3728		22003 0830		SIGALE		22003 0830									
S. GALE		22003 0830		FED EX											
				Lee (A)		2-21-03 1000									
LABORATORY SECTION		Received By		Title		Date/Time									
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time									



**ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

**SAMPLE RECEIPT CHECKLIST**

Client: Floor Date/Time received 1000 2-21-03  
 CoC No. FU3-004-20  
 Container I.D. No. ERC-02-SC6 Requested TAT (Days) 4S P.O. Received Yes [ ] No [ ]

**INSPECTION**

1. Custody seals on shipping container intact? Yes [  ] No [ ] N/A [ ]
  2. Custody seals on shipping container dated & signed? Yes [  ] No [ ] N/A [ ]
  3. Custody seals on sample containers intact? Yes [  ] No [ ] N/A [ ]
  4. Custody seals on sample containers dated & signed? Yes [  ] No [ ] N/A [ ]
  5. Packing material is: Wet [ ] Dry [  ]
  6. Number of samples in shipping container: 1
  7. Number of containers per sample: 2 (Or see CoC \_\_\_\_\_)
  8. Paperwork agrees with samples? Yes [  ] No [ ]
  9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [  ]
  10. Samples are: In good condition [  ] Leaking [ ] Broken Container [ ] Missing [ ]
  11. Samples are: Preserved [  ] Not preserved [ ] Preservative HNO3
  12. Describe any anomalies: \_\_\_\_\_
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date \_\_\_\_\_
14. Received by [Signature] Date: 2-21-03 Time: 1000

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Alpha Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_