

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD I05-032 43181

DATE RECEIVED: 05/25/05

LVL LOT # :0505L585

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
B1CR96							
BROMIDE BY IC	001	W	05LIC037	05/24/05	05/26/05	05/26/05	
BROMIDE BY IC	001 REP	W	05LIC037	05/24/05	05/26/05	05/26/05	
BROMIDE BY IC	001 MS	W	05LIC037	05/24/05	05/26/05	05/26/05	
CHLORIDE BY IC	001	W	05LICA37	05/24/05	05/26/05	05/26/05	
CHLORIDE BY IC	001 REP	W	05LICA37	05/24/05	05/26/05	05/26/05	
CHLORIDE BY IC	001 MS	W	05LICA37	05/24/05	05/26/05	05/26/05	
FLUORIDE BY IC	001	W	05LIC037	05/24/05	05/26/05	05/26/05	
FLUORIDE BY IC	001 REP	W	05LIC037	05/24/05	05/26/05	05/26/05	
FLUORIDE BY IC	001 MS	W	05LIC037	05/24/05	05/26/05	05/26/05	
NITRITE BY IC	001	W	05LIC037	05/24/05	05/26/05	05/26/05	1215
NITRITE BY IC	001 REP	W	05LIC037	05/24/05	05/26/05	05/26/05	1247
NITRITE BY IC	001 MS	W	05LIC037	05/24/05	05/26/05	05/26/05	1320
NITRATE BY IC	001	W	05LIC037	05/24/05	05/26/05	05/26/05	1215
NITRATE BY IC	001 REP	W	05LIC037	05/24/05	05/26/05	05/26/05	1247
NITRATE BY IC	001 MS	W	05LIC037	05/24/05	05/26/05	05/26/05	1320
PHOSPHATE BY IC	001	W	05LIC037	05/24/05	05/26/05	05/26/05	1215
PHOSPHATE BY IC	001 REP	W	05LIC037	05/24/05	05/26/05	05/26/05	1247
PHOSPHATE BY IC	001 MS	W	05LIC037	05/24/05	05/26/05	05/26/05	1320
SULFATE BY IC	001	W	05LICA37	05/24/05	05/26/05	05/26/05	
SULFATE BY IC	001 REP	W	05LICA37	05/24/05	05/26/05	05/26/05	
SULFATE BY IC	001 MS	W	05LICA37	05/24/05	05/26/05	05/26/05	

LAB QC:

BROMIDE BY IC	MB1	W	05LIC037	N/A	05/26/05	05/26/05	
BROMIDE BY IC	MB1 BS	W	05LIC037	N/A	05/26/05	05/26/05	
CHLORIDE BY IC	MB1	W	05LICA37	N/A	05/26/05	05/26/05	
CHLORIDE BY IC	MB1 BS	W	05LICA37	N/A	05/26/05	05/26/05	
FLUORIDE BY IC	MB1	W	05LIC037	N/A	05/26/05	05/26/05	
FLUORIDE BY IC	MB1 BS	W	05LIC037	N/A	05/26/05	05/26/05	
NITRITE BY IC	MB1	W	05LIC037	N/A	05/26/05	05/26/05	
NITRITE BY IC	MB1 BS	W	05LIC037	N/A	05/26/05	05/26/05	
NITRATE BY IC	MB1	W	05LIC037	N/A	05/26/05	05/26/05	
NITRATE BY IC	MB1 BS	W	05LIC037	N/A	05/26/05	05/26/05	
PHOSPHATE BY IC	MB1	W	05LIC037	N/A	05/26/05	05/26/05	

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PHOSPHATE BY IC	MB1 BS	W	05LIC037	N/A	05/26/05	05/26/05
SULFATE BY IC	MB1	W	05LICA37	N/A	05/26/05	05/26/05
SULFATE BY IC	MB1 BS	W	05LICA37	N/A	05/26/05	05/26/05



Analytical Report

Client: TNU-HANFORD I05-032 H3181
LVL#: 0505L585

W.O.#: 11343-606-001-9999-00
Date Received: 05-25-05

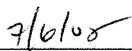
INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The sample was prepared and analyzed in accordance with the method checked on the attached glossary.

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

3. Sample holding times as required by the method and/or contract were met with the exception of Nitrite, Nitrate 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.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits.
7. The matrix spike recoveries for Bromide, Chloride, Fluoride, Nitrite, Nitrate, Phosphate and Sulfate were within the 75-125% control limits.
8. The replicate analyses for Bromide, Chloride, Fluoride, Nitrite, Nitrate Phosphate and Sulfate were within the 20% Relative Percent Difference (RPD) control limit.
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


Date

npj05-585

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 12 pages.

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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 ✓ Chloride ✓ Fluoride	✓ 300.0	___ 9056	
✓ Nitrate ✓ Nitrite ✓ Phosphate	✓ 300.0	___ 9056	
✓ Sulfate ___ Formate ___ Acetate ___ Oxalate	✓ 300.0	___ 9056	
Chloride	325.2	___ 9251	
Chlorine, Residual	330.5 (mod)		
Cyanide, Amenable to Chlorination	335.2	___ 9010B	
Cyanide, Total	335.2	___ 9010B	___ 9014 ___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable			___ 412 (a) ___ 4500CN-I (b)
COD	410.4(mod)		___ 5220C (b)
Color	110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	340.2		___ 4500-FC
Hardness, Calcium	215.2		
Hardness, Total	130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	425.1		
___ Nitrate-Nitrite ___ Nitrate ___ Nitrite	353.2		
Ammonia	350.3		
Total ___ Kjeldahl ___ Organic Nitrogen	351.3		
Total ___ Organic ___ Inorganic Carbon	415.1	___ 9060	
Oil & Grease	413.1	___ 9070	
___ pH ___ pH; paper	150.1	___ 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		___ 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:	

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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 06/03/05

CLIENT: TNU-HANFORD I05-032 ~~43181~~
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0505L585

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	B1CR96	Bromide by IC	0.25	u MG/L	0.25	1.0
		Chloride by IC	2.2	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	3.56	MG/L	0.25	1.0
		Phosphate by IC	0.25	u MG/L	0.25	1.0
		Sulfate by IC	15.7	MG/L	2.5	10.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/03/05

CLIENT: TNU-HANFORD I05-032 ~~43151~~
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0505L585

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK10	05LIC037-MB1	Bromide 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
BLANK10	05LICA37-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/03/05

CLIENT: TNU-HANFORD I05-032 *43181*
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0505L585

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
=====	=====	=====	=====	=====	=====	=====	=====
-001	B1CR96	Bromide by IC	9.2	0.00	10.0	92.4	2.0
		Chloride by IC	11.9	2.2	10.0	97.4	2.0
		Fluoride by IC	9.7	0.077	10.0	96.1	2.0
		Nitrite by IC	9.44	0.25u	10.0	94.4	2.0
		Nitrate by IC	13.6	3.56	10.0	100	2.0
		Phosphate by IC	9.9	0.25u	10.0	98.5	2.0
		Sulfate by IC	115	15.7	100	99.0	20.0
BLANK10	05LIC037-MB1	Bromide by IC	4.7	0.25u	5.0	93.7	1.0
		Fluoride by IC	4.9	0.25u	5.0	97.3	1.0
		Nitrite by IC	4.56	0.25u	5.00	91.1	1.0
		Nitrate by IC	4.87	0.25u	5.00	97.5	1.0
		Phosphate by IC	5.2	0.25u	5.0	103.5	1.0
BLANK10	05LICA37-MB1	Chloride by IC	4.8	0.25u	5.0	95.7	1.0
		Sulfate by IC	4.9	0.25u	5.0	98.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/03/05

CLIENT: TNU-HANFORD I05-032 *H3171*
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0505L585

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
=====	=====	=====	=====	=====	=====	=====
-001REP	B1CR96	Bromide by IC	0.25u	0.25u	NC	1.0
		Chloride by IC	2.2	2.2	0.50	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	3.56	3.62	1.9	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	15.7	15.1	4.2	10.0

PNNL	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # I05-032-31
		Page <u>1</u> of <u>1</u>

Collector D.P. CONNOLLY	Contact/Requester DL STEWART	Telephone No. MSIN FAX 509-376-5056
SAF No. I05-032	Sampling Origin HANFORD SITE	Purchase Order/Charge Code
Project Title CERCLA 100 HR3 IAM (1&2) MAY 2005	Logbook DTSC SOWS - H91	Ice Chest No. SAW 0-500 Temp.
Shipped To (Lab) Lionville Laboratory Incorporated	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 847 430 505 422
Protocol CERCLA	Priority: 45 Days	Offsite Property No.

POSSIBLE SAMPLE HAZARDS/REMARKS * * *	SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> A, G, I, S, and W SAFS may be grouped into one SDG to facilitate analytical batching, not to exceed SDG closure of 14 days. Submit invoices & deliverables to DL Stewart, PNNL
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Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1CR96		W	5-24-05	0852	1x500-mL P	IC Anions - 300.0	Cool 4C
B1CR96		W	↓	↓	1x20-mL P	Activity Scan	None

Relinquished By D.P. CONNOLLY <i>[Signature]</i>	Print	Sign	Date/Time MAY 24 2005	Received By FED EX	Print	Sign	Date/Time	Matrix * S = Soil DS = Drum Solid SE = Sediment DI = Drum Liquid SO = Solid T = Tissue SI = Sludge WI = Wine W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
<i>FedEx</i>			Date/Time 5/25/05 1000	<i>[Signature]</i>			Date/Time 5-25-05 1000	
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
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Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: *TNU-HANFORD*

Date: *5/25/05*

Purchase Order / Project# /
 SAF# SOW# / Release #: *105-032*

LvLI Batch # :

Sample Custodian: *J. Hernandez*

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|---|---|---|
| 1. Samples Hand Delivered or <u>Shipped</u> | Carrier <i>FedEx</i> | Airbill# <i>847430505422</i> |
| 2. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals Comments |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Samples received cooled or ambient? | Temp <i>3-2</i> °C | Cooler # <i>SAWS-500</i> |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 7. coc signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 8. Sample containers are intact? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 9. All samples on coc received? All samples received on coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 10. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 11. Samples properly preserved? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 12. Samples received within hold times? Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 13. VOA, TOC, TOX free of headspace? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A
<i>4/5-25-05</i> |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> No
Discrepancies |