

0051490

SDG_NUM	SAMP_NU	METHOD_NAM	CON_ID	CON_LONG_NAME	VALUE	LAB_QU	VALIDATION_Q
H0338	B0TL69	8270_SVOA_G	120-82-1	1,2,4-Trichlorobenzene	10	U	J
H0338	B0TL71	8270_SVOA_G	120-82-1	1,2,4-Trichlorobenzene	10	U	J
H0338	B0TL69	8270_SVOA_G	95-50-1	1,2-Dichlorobenzene	10	U	J
H0338	B0TL71	8270_SVOA_G	95-50-1	1,2-Dichlorobenzene	10	U	J
H0338	B0TL69	8270_SVOA_G	541-73-1	1,3-Dichlorobenzene	10	U	J
H0338	B0TL71	8270_SVOA_G	541-73-1	1,3-Dichlorobenzene	10	U	J
H0338	B0TL69	8270_SVOA_G	106-46-7	1,4-Dichlorobenzene	10	U	J
H0338	B0TL71	8270_SVOA_G	106-46-7	1,4-Dichlorobenzene	10	U	J
H0338	B0TL69	8270_SVOA_G	91-58-7	2-Chloronaphthalene	10	U	J
H0338	B0TL71	8270_SVOA_G	91-58-7	2-Chloronaphthalene	10	U	J
H0338	B0TL69	8270_SVOA_G	91-94-1	3,3'-Dichlorobenzidine	10	U	J
H0338	B0TL71	8270_SVOA_G	91-94-1	3,3'-Dichlorobenzidine	10	U	J
H0338	B0TL71	8270_SVOA_G	84-74-2	Di-n-butylphthalate	0.5	J	J
H0338	B0TL69	8270_SVOA_G	84-74-2	Di-n-butylphthalate	0.5	J	J
H0338	B0TL69	8270_SVOA_G	118-74-1	Hexachlorobenzene	10	U	J
H0338	B0TL71	8270_SVOA_G	118-74-1	Hexachlorobenzene	10	U	J
H0338	B0TL71	8270_SVOA_G	87-68-3	Hexachlorobutadiene	10	U	J
H0338	B0TL69	8270_SVOA_G	87-68-3	Hexachlorobutadiene	10	U	J
H0338	B0TL71	8270_SVOA_G	77-47-4	Hexachlorocyclopentadiene	10	U	J
H0338	B0TL69	8270_SVOA_G	77-47-4	Hexachlorocyclopentadiene	10	U	J
H0338	B0TL71	8270_SVOA_G	67-72-1	Hexachloroethane	10	U	J
H0338	B0TL69	8270_SVOA_G	67-72-1	Hexachloroethane	10	U	J

*Validation qualifications entered into 9/EdS*

*1-14-99*

*RLW*



SDG NUM	SAMP NU	METHOD NAM	CON ID	CON LONG NAME	VALUE	LAB QU	VALIDATION Q
H0338	B0TL69	160.1_TDS	TDS	Total dissolved solids	1610		J
H0338	B0TL71	160.1_TDS	TDS	Total dissolved solids	1600		J
H0338	B0TL69	160.2_TSS	TSS	Total suspended solids	5	U	J
H0338	B0TL71	160.2_TSS	TSS	Total suspended solids	5	U	J
H0338	B0TL69	300.0_ANIONS	24959-67-9	Bromide	2.8		
H0338	B0TL71	300.0_ANIONS	24959-67-9	Bromide	2.8		
H0338	B0TL69	300.0_ANIONS	16984-48-8	Fluoride	1.4		
H0338	B0TL71	300.0_ANIONS	16984-48-8	Fluoride	1.5		
H0338	B0TL71	300.0_ANIONS	14797-55-8	Nitrate	120		J
H0338	B0TL69	300.0_ANIONS	14797-55-8	Nitrate	130		J
H0338	B0TL71	300.0_ANIONS	14797-65-0	Nitrite	5	U	R
H0338	B0TL69	300.0_ANIONS	14797-65-0	Nitrite	5	U	R
H0338	B0TL69	300.0_ANIONS	14808-79-8	Sulfate	324		
H0338	B0TL71	300.0_ANIONS	14808-79-8	Sulfate	338		
H0338	B0TL71	413.1_OILGRE	OIL/GREASE	Oil and grease	1.1	U	J
H0338	B0TL69	413.1_OILGRE	OIL/GREASE	Oil and grease	1.1	U	J
H0338	B0TL71	9040_PH	PH	pH Measurement	8		J
H0338	B0TL69	9040_PH	PH	pH Measurement	7.9		J

*Validation qualifier entered into HERS*

*4-14-99*

*RZOW*

SDG NUM	SAMP NU	METHOD NAM	CON ID	CON LONG NAME	VALUE	LAB QU	VALIDATION Q
H0338	B0TL69	8015_VOA_GC	71-36-3	1-Butanol	5.6	U	J
H0338	B0TL69	8015_VOA_GC	67-56-1	Methanol	6.6	U	J
H0338	B0TL71	8260_VOA_GC	75-09-2	Methylenechloride	2	JB	J
H0338	B0TL69	8260_VOA_GC	75-09-2	Methylenechloride	3	JB	J
H0338	B0TL69	8315_CRBNYL	50-00-0	Formaldehyde	12	U	J

*Validation qualifier entered in HCA*

*4-14-99*

*R206*

SDG N	SAMP NU	METHOD NAM	CON ID	CON LONG NAME	VALUE	LAB Q	ANAL U	VALIDATION Q	FINAL
H0338	B0TL69	6010_METALS	7429-90-5	Aluminum	17.8	U	ug/L		17.8U
H0338	B0TL69	6010_METALS	7440-36-0	Antimony	2.3	U	ug/L		2.3U
H0338	B0TL69	6010_METALS	7440-38-2	Arsenic	14.9		ug/L		14.9
H0338	B0TL69	6010_METALS	7440-39-3	Barium	64.6	B	ug/L		64.6B
H0338	B0TL69	6010_METALS	7440-41-7	Beryllium	0.12	B	ug/L	U	.12BU
H0338	B0TL69	6010_METALS	7440-43-9	Cadmium	0.4	U	ug/L		.4U
H0338	B0TL69	6010_METALS	7440-70-2	Calcium	158000		ug/L		158000
H0338	B0TL69	6010_METALS	7440-47-3	Chromium	14.1		ug/L		14.1
H0338	B0TL69	6010_METALS	7440-48-4	Cobalt	0.6	U	ug/L		.6U
H0338	B0TL69	6010_METALS	7440-50-8	Copper	6.4	B	ug/L	U	6.4BU
H0338	B0TL69	6010_METALS	7439-89-6	Iron	17.9	U	ug/L		17.9U
H0338	B0TL69	6010_METALS	7439-92-1	Lead	1.8	U	ug/L		1.8U
H0338	B0TL69	6010_METALS	7439-95-4	Magnesium	47700		ug/L		47700
H0338	B0TL69	6010_METALS	7439-96-5	Manganese	0.2	U	ug/L		.2U
H0338	B0TL69	6010_METALS	7440-02-0	Nickel	6.3	B	ug/L		6.3B
H0338	B0TL69	6010_METALS	7440-09-7	Potassium	23900		ug/L	J	23900J
H0338	B0TL69	6010_METALS	7782-49-2	Selenium	3.6	U	ug/L		3.6U
H0338	B0TL69	6010_METALS	7440-21-3	Silicon	16900		ug/L	J	16900J
H0338	B0TL69	6010_METALS	7440-22-4	Silver	0.9	U	ug/L		.9U
H0338	B0TL69	6010_METALS	7440-23-5	Sodium	258000		ug/L		258000
H0338	B0TL69	6010_METALS	7440-28-0	Thallium	4	B	ug/L		4B
H0338	B0TL69	6010_METALS	7440-31-5	Tin	2.7	U	ug/L		2.7U
H0338	B0TL69	6010_METALS	7440-62-2	Vanadium	25.9	B	ug/L		25.9B
H0338	B0TL69	6010_METALS	7440-66-6	Zinc	1	B	ug/L	U	1BU
H0338	B0TL71	6010_METALS	7429-90-5	Aluminum	21.5	U	ug/L		21.5U
H0338	B0TL71	6010_METALS	7440-36-0	Antimony	2.3	U	ug/L		2.3U
H0338	B0TL71	6010_METALS	7440-38-2	Arsenic	14.4		ug/L		14.4
H0338	B0TL71	6010_METALS	7440-39-3	Barium	64.2	B	ug/L		64.2B
H0338	B0TL71	6010_METALS	7440-41-7	Beryllium	0.16	B	ug/L	U	.16BU
H0338	B0TL71	6010_METALS	7440-43-9	Cadmium	0.4	U	ug/L		.4U
H0338	B0TL71	6010_METALS	7440-70-2	Calcium	159000		ug/L		159000
H0338	B0TL71	6010_METALS	7440-47-3	Chromium	15.7		ug/L		15.7
H0338	B0TL71	6010_METALS	7440-48-4	Cobalt	0.6	U	ug/L		.6U
H0338	B0TL71	6010_METALS	7440-50-8	Copper	6.7	B	ug/L	U	6.7BU
H0338	B0TL71	6010_METALS	7439-89-6	Iron	17.9	U	ug/L		17.9U
H0338	B0TL71	6010_METALS	7439-92-1	Lead	1.8	U	ug/L		1.8U
H0338	B0TL71	6010_METALS	7439-95-4	Magnesium	47800		ug/L		47800
H0338	B0TL71	6010_METALS	7439-96-5	Manganese	0.2	U	ug/L		.2U
H0338	B0TL71	6010_METALS	7440-02-0	Nickel	6.1	B	ug/L		6.1B
H0338	B0TL71	6010_METALS	7440-09-7	Potassium	24100		ug/L	J	24100J
H0338	B0TL71	6010_METALS	7782-49-2	Selenium	3.6	U	ug/L		3.6U
H0338	B0TL71	6010_METALS	7440-21-3	Silicon	17000		ug/L	J	17000J
H0338	B0TL71	6010_METALS	7440-22-4	Silver	0.9	U	ug/L		.9U
H0338	B0TL71	6010_METALS	7440-23-5	Sodium	260000		ug/L		260000
H0338	B0TL71	6010_METALS	7440-28-0	Thallium	3.7	U	ug/L		3.7U
H0338	B0TL71	6010_METALS	7440-31-5	Tin	2.7	U	ug/L		2.7U
H0338	B0TL71	6010_METALS	7440-62-2	Vanadium	26.3	B	ug/L		26.3B
H0338	B0TL71	6010_METALS	7440-66-6	Zinc	0.8	U	ug/L		.8U

*Validation qualifiers entered into HES*

*4-16-99*

*RLW*

Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: Semivolatiles - Data Package No. H0338-RLN (SDG No. H0338)

## INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0338-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOTL69	1/12/99	Water	C	See note 1
BOTL71	1/12/99	Water	C	See note 1

1 - Semivolatiles by EPA 8270B and PAHs by 8310.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Water samples must be extracted within 7 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 75% to 125%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to both a MSD surrogate (2-fluorobiphenyl) and MSD percent recoveries below QC limits (1,4-dichlorobenzene, n-nitroso-di-n-propylamine, 1,2,4-

trichlorobenzene and acenaphthene), the following analytes were qualified as estimates and flagged "J" in both samples:

1,3-dichlorobenzene	1,4-dichlorobenzene
1,2-dichlorobenzene	hexachloroethane
hexachlorobutadiene	hexachlorocyclopentadiene
3,3-dichlorobenzidine	1,2,4-trichlorobenzene
hexachlorobenzene	2-chloronaphthalene

All other accuracy results were acceptable.

#### Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the CRQL are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All sample surrogate recovery results were acceptable.

- **Precision**

#### Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-20%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to an RPD outside QC limits, all di-n-butylphthalate results were qualified as estimates and flagged "J".

All other MS/MSD RPD results were acceptable.

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- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Environmental Restoration Disposal Facility Leachate Delisting Petition, (DOE/RL-98-47) PQLs (or against the CRDLs if no PQL was available) to ensure that laboratory detection levels meet the required criteria. Forty-eight (48) analytes had detection levels above the PQL/CRQL (see pages 11-15). Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL/CRQL.

- **Completeness**

Data package No. H0338 was submitted for validation and verified for completeness. The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### **MINOR DEFICIENCIES**

Due to an RPD outside QC limits, all di-n-butylphthalate results were qualified as estimates and flagged "J". Due to both a MSD surrogate (2-fluorobiphenyl) and MSD percent recoveries below QC limits (1,4-dichlorobenzene, n-nitroso-di-n-propylamine, 1,2,4-trichlorobenzene and acenaphthene), the following analytes were qualified as estimates and flagged "J" in both samples:

1,3-dichlorobenzene	1,4-dichlorobenzene
1,2-dichlorobenzene	hexachloroethane
hexachlorobutadiene	hexachlorocyclopentadiene
3,3-dichlorobenzidine	1,2,4-trichlorobenzene
hexachlorobenzene	2-chloronaphthalene

Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

## REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

000006

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

**Appendix 2**

**Summary of Data Qualification**

000008

DATA QUALIFICATION SUMMARY

SDG: H0338	REVIEWER: TLI	DATE: 3/22/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
di-n-Butylphthalate	J	All	RPD
1,3-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene hexachloroethane hexachlorobutadiene hexachlorocyclopentadiene 3,3-dichlorobenzidine 1,2,4-trichlorobenzene hexachlorobenzene 2-chloronaphthalene	J	All	MSD surrogate and percent recovery below QC limits

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

000010

Project: BECHTEL-HANFORD		SDG: H0338		BOTL69		BOTL71	
Laboratory: RECRA LabNet							
Case:	Sample Number	CRQL	Result	Q	Result	Q	Result
Location	Location						
Remarks	Remarks						
Sample Date	1/12/99			10 U	10 U		
Extraction Date	1/18/99			10 U	10 U		
Analysis Date	2/4/99			10 U	10 U		
Semivolatiles (8270B)	CRQL	Result	Q	Result	Q	Result	Q
Phenol*	0.42		10 U		10 U		
bis(2-Chloroethyl)ether*	1.5		10 U		10 U		
2-Chlorophenol*	1.2		10 U		10 U		
1,3-Dichlorobenzene*	1.3		10 U		10 U		
1,4-Dichlorobenzene*	1.4		10 U		10 U		
Benzyl Alcohol			10 U		10 U		
1,2-Dichlorobenzene*	1.2		10 U		10 U		
2-Methylphenol			10 U		10 U		
bis(2-Chloroisopropyl)ether*	3.1		10 U		10 U		
4-Methylphenol			10 U		10 U		
N-Nitroso-di-n-propylamine*	0.46		10 U		10 U		
Hexachloroethane*	0.98		10 U		10 U		
Nitrobenzene*	1.2		10 U		10 U		
Isophorone*	1.4		10 U		10 U		
2-Nitrophenol	10		10 U		10 U		
2,4-Dimethylphenol*	0.79		10 U		10 U		
Benzoic acid			25 U		25 U		
bis(2-Chloroethoxy)methane*	1.6		10 U		10 U		
2,4-Dichlorophenol*	1.2		10 U		10 U		
1,2,4-Trichlorobenzene	10		10 U		10 U		
Naphthalene*	1.4		10 U		10 U		
4-Chloroaniline	10		10 U		10 U		
Hexachlorobutadiene*	0.89		10 U		10 U		
4-Chloro-3-methylphenol*	1.1		10 U		10 U		
2-Methylnaphthalene	10		10 U		10 U		
Hexachlorocyclopentadiene	10		10 U		10 U		
2,4,6-Trichlorophenol*	1.2		10 U		10 U		
2,4,5-Trichlorophenol*	0.76		25 U		25 U		
2-Chloronaphthalene*	1.4		10 U		10 U		
2-Nitroaniline	25		25 U		25 U		
Dimethylphthalate*	1.3		10 U		10 U		
Acenaphthylene	10		10 U		10 U		
2,6-Dinitrotoluene	10		10 U		10 U		

\* - The reported detection limit is above the PQL/CRQL

000011

Project: BECHTEL-HANFORD		SDG: H0338	
Laboratory: RECRA LabNet		BOTL69	BOTL71
Sample Number	Location	Result	Q
Remarks	CRQL	Result	Q
Sample Date	1/12/99	1/12/99	1/12/99
Extraction Date	1/18/99	1/18/99	1/18/99
Analysis Date	2/4/99	2/4/99	2/4/99
Semivolatiles (8270B)	CRQL	Result	Q
3-Nitroaniline	25	25 U	25 U
Acenaphthene	10	10 U	10 U
2,4-Dinitrophenol*	2.3	25 U	25 U
4-Nitrophenol*	2.1	25 U	25 U
Dibenzofuran	10	10 U	10 U
2,4-Dinitrotoluene	10	10 U	10 U
Diethylphthalate*	1.6	10 U	10 U
4-Chlorophenyl-phenyl ether	10	10 U	10 U
Fluorene*	1.5	10 U	10 U
4-Nitroaniline	25	25 U	25 U
4,6-Dinitro-2-methylphenol	25	25 U	25 U
N-Nitrosodiphenylamine*	1.5	10 U	10 U
4-Bromophenyl-phenyl ether*	1.9	10 U	10 U
Hexachlorobenzene	10	10 UJ	10 UJ
Pentachlorophenol*	1.6	25 U	25 U
Phenanthrene	10	10 U	10 U
Anthracene	10	10 U	10 U
Di-n-butylphthalate*	1.6	0.5 U	0.5 U
Fluoranthene*	1.6	10 U	10 U
Pyrene*	1.6	10 U	10 U
Butylbenzylphthalate*	2.2	10 U	10 U
3,3'-Dichlorobenzidine	10	10 UJ	10 UJ
Benzo(a)anthracene*	1	10 U	10 U
Chrysene*	2.1	10 U	10 U
bis(2-Ethylhexyl)phthalate*	2.9	10 U	10 U
Di-n-octylphthalate*	1.8	10 U	10 U
Benzo(b)fluoranthene*	1	10 U	10 U
Benzo(k)fluoranthene*	1.1	10 U	10 U
Benzo(a)pyrene	2.2	10 U	10 U
Indeno(1,2,3-cd)pyrene	10	10 U	10 U
Dibenz(a,h)anthracene*	0.15	10 U	10 U
Benzo(g,h,i)perylene	10	10 U	10 U

\* - The reported detection limit is above the POL/CRQL

000042

Project: BECHTEL-HANFORD		SDG: H0338		BOTL69		BOTL71	
Laboratory: RECRA LabNet							
Case:	Sample Number	Location	Remarks	Sample Date	Extraction Date	Analysis Date	
				1/12/99	1/18/99	2/4/99	
Semivolatile (8270B)		CRQL	Q	Result	Q	Result	Q
1,4-Dioxane			10 U	10 U	10 U		
Methyl methacrylate			10 U	10 U	10 U		
Pyridine*	0.96		10 U	10 U	10 U		
N-Nitrosodimethylamine*	1.3		10 U	10 U	10 U		
Ethyl Methacrylate			10 U	10 U	10 U		
2-Picoline			10 U	10 U	10 U		
N-Nitrosomethylethylamine			10 U	10 U	10 U		
Methyl methanesulfonate			10 U	10 U	10 U		
N-Nitrosodiethylamine			10 U	10 U	10 U		
Ethyl methanesulfonate*	3.3		10 U	10 U	10 U		
Aniline*	2.7		10 U	10 U	10 U		
Pentachloroethane			10 U	10 U	10 U		
3-Methylphenol			10 U	10 U	10 U		
N-Nitrosopyrrolidine			10 U	10 U	10 U		
Acetophenone*	3.4		10 U	10 U	10 U		
N-Nitrosomorpholine	10		10 U	10 U	10 U		
O-Toluidine			10 U	10 U	10 U		
N-Nitrosopiperidine			50 U	50 U	50 U		
a,a-Dimethylphenethylamine			10 U	10 U	10 U		
2,6-Dichlorophenol			10 U	10 U	10 U		
Hexachloropropene			10 U	10 U	10 U		
p-Phenylenediamine	100		10 U	10 U	10 U		
N-Nitroso-di-n-butylamine			10 U	10 U	10 U		
Safrole			10 U	10 U	10 U		
1,2,4,5-Tetrachlorobenzene			10 U	10 U	10 U		
Isosafrole			10 U	10 U	10 U		
1,4-Naphthoquinone			10 U	10 U	10 U		
1,3-Dinitrobenzene*	3.8		10 U	10 U	10 U		
Pentachlorobenzene			10 U	10 U	10 U		
1-Naphthylamine			10 U	10 U	10 U		
2-Naphthylamine*	4.4		10 U	10 U	10 U		
2,3,4,6-Tetrachlorophenol			10 U	10 U	10 U		

\* - The reported detection limit is above the PQL/CRQL

000013





RFW Batch Number: 9901L860  
 Cust ID: B0TL69 B0TL71 B0TL71 B0TL71 B0TL71 SBLKPD BS  
 Sample Information: RFW#: 001 002 MS 002 MSD 99LE0059-MB1 99LE0059-MB1  
 Matrix: WATER WATER WATER WATER WATER  
 D.F.: 1.00 1.00 1.00 1.00 1.00  
 Units: ug/L ug/L ug/L ug/L ug/L  
 WATER WATER WATER WATER WATER

Surrogate	67 %	68 %	54 %	36 %	59 %	36 %	36 %
Nitrobenzene-d5	10 U	10 U	53 %	30 %	10 U	10 U	38 %
2-Fluorobiphenyl	10 U	10 U	20 U	20 U	10 U	10 U	10 U
p-Terphenyl-d14	10 U	10 U	53 %	34 %	10 U	10 U	10 U
Phenol-d5	10 U	10 U	20 U	20 U	10 U	10 U	37 %
2-Fluorophenol	10 U	10 U	44 %	20 U	10 U	10 U	46 %
2,4,6-Tribromophenol	10 U	10 U	20 U	30 %	10 U	10 U	17 %
Phenol	10 U	10 U	47 %	30 %	10 U	10 U	34 %
bis(2-Chloroethyl)ether	10 U	10 U	53 %	30 %	10 U	10 U	32 %
2-Chlorophenol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	20 U	20 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	20 U	20 U	10 U	10 U	10 U
Benzyl alcohol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	20 U	20 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
bis(2-Chloroisopropyl)ether	10 U	10 U	20 U	20 U	10 U	10 U	10 U
4-Methylphenol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
N-Nitroso-Di-n-propylamine	10 U	10 U	58 %	38 %	10 U	10 U	46 %
Hexachloroethane	10 U	10 U	20 U	20 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	20 U	20 U	10 U	10 U	10 U
Isophorone	10 U	10 U	20 U	20 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
Benzoic acid	25 U	25 U	50 U	50 U	25 U	25 U	25 U
bis(2-Chloroethoxy)methane	10 U	10 U	20 U	20 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	49 %	33 %	10 U	10 U	10 U
Naphthalene	10 U	10 U	20 U	20 U	10 U	10 U	32 %
4-Chloroaniline	10 U	10 U	20 U	20 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	20 U	20 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	20 U	20 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	51 %	29 %	10 U	10 U	36 %
Hexachlorocyclopentadiene	10 U	10 U	20 U	20 U	10 U	10 U	10 U
	10 U	10 U	20 U	20 U	10 U	10 U	10 U

\* = Outside of EPA CLP QC limits.

000016

RK 3/15/99



Cust ID:	Work Order:	Page:
B0TL69	10985001001	10
RFW#:	B0TL71	SBLKPD BS
001	002 MS	002 MSD
10 U	20 U	20 U
Methyl methacrylate	10 U	10 U
Pyridine	10 U	10 U
N-Nitrosodimethylamine	10 U	10 U
Ethyl methacrylate	10 U	10 U
2-Picoline	10 U	10 U
N-Nitrosomethylethylamine	10 U	10 U
Methyl methanesulfonate	10 U	10 U
N-Nitrosodiethylamine	10 U	10 U
Ethyl methanesulfonate	10 U	10 U
Aniline	10 U	10 U
Pentachloroethane	10 U	10 U
3-Methylphenol	10 U	10 U
N-Nitrosopyrrolidine	10 U	10 U
Acetophenone	10 U	10 U
N-Nitrosomorpholine	10 U	10 U
O-Toluidine	10 U	10 U
N-Nitrosopiperidine	10 U	10 U
a,a-Dimethylphenethylamine	50 U	10 U
2,6-Dichlorophenol	10 U	10 U
Hexachloropropene	10 U	10 U
p-Phenylenediamine	10 U	10 U
N-Nitroso-di-n-butylamine	10 U	10 U
Safrole	10 U	10 U
1,2,4,5-Tetrachlorobenzene	10 U	10 U
Isosafrole	10 U	10 U
1,4-Naphthoquinone	10 U	10 U
1,3-Dinitrobenzene	10 U	10 U
Pentachlorobenzene	10 U	10 U
1-Naphthylamine	10 U	10 U
2-Naphthylamine	10 U	10 U
2,3,4,6-Tetrachlorophenol	10 U	10 U
1,3,5-Trinitrobenzene	10 U	10 U
Diallyl	10 U	10 U
Phenacetin	10 U	10 U
Diphenylamine	10 U	10 U
5-Nitro-o-toluidine	10 U	10 U
4-Aminobiphenyl	10 U	10 U
Pronamide	10 U	10 U
2-sec-Butyl-4,6-dinitrophenol	10 U	10 U
Pentachloronitrobenzene	100 U	100 U
* = Outside of EPA CLP QC limits.	100 U	100 U

000018

Cust ID: B0TL69  
 RFW#: 001  
 Matrix: WATER  
 D.F.: 1.00  
 Units: ug/L

B0TL71  
 002 MS  
 WATER  
 1.00  
 ug/L

B0TL71  
 002 MSD  
 WATER  
 1.00  
 ug/L

BLK

99LE0061-MB1  
 WATER  
 1.00  
 ug/L

BLK BS

99LE0061-MB1  
 WATER  
 1.00  
 ug/L

Surrogate:	Triphenylene	100	%	fl	93	%	fl	96	%	fl	91	%	fl	87	%	fl	101	%
Naphthalene	18	U	18	U	86	%	74	%	18	U	82	%						
Acenaphthylene	23	U	23	U	89	%	86	%	23	U	89	%						
Acenaphthene	18	U	18	U	91	%	89	%	18	U	91	%						
Fluorene	2.1	U	2.1	U	91	%	89	%	2.1	U	91	%						
Phenanthrene	6.5	U	6.5	U	90	%	89	%	6.4	U	90	%						
Anthracene	6.7	U	6.7	U	94	%	92	%	6.6	U	95	%						
Fluoranthene	2.1	U	2.1	U	94	%	94	%	2.1	U	96	%						
Pyrene	2.8	U	2.8	U	85	%	85	%	2.7	U	86	%						
Benzo(a)anthracene	0.13	U	0.13	U	94	%	94	%	0.13	U	95	%						
Chrysene	1.5	U	1.5	U	90	%	92	%	1.5	U	93	%						
Benzo(b)fluoranthrene	0.18	U	0.18	U	93	%	94	%	0.18	U	96	%						
Benzo(k)fluoranthrene	0.17	U	0.17	U	93	%	95	%	0.17	U	98	%						
Benzo(a)pyrene	0.23	U	0.23	U	86	%	88	%	0.23	U	89	%						
Dibenzo(a,h)anthracene	0.31	U	0.31	U	91	%	91	%	0.30	U	95	%						
Benzo(ghi)perylene	0.78	U	0.78	U	86	%	87	%	0.76	U	89	%						
Indeno(1,2,3-cd)pyrene	0.44	U	0.44	U	93	%	93	%	0.43	U	93	%						

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

*01/26/99*

020000

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000021**









**Appendix 5**

**Data Validation Supporting Documentation**

GC/MS ORGANIC DATA VALIDATION CHECKLIST

50

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:			DATA PACKAGE: H0338		
VALIDATOR: TLI	LAB: <del>PL</del> QES		DATE: 3/4/99		
CASE:	SDG: H0338				
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input checked="" type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<del>SW-846 8240</del>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX Water					
B0TL69 B0TL71					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A  
 Is a case narrative present? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

*AZ* 000028

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No **N/A**  
 Are initial calibrations acceptable? . . . . . Yes No **N/A**  
 Are continuing calibrations acceptable? . . . . . Yes No **N/A**

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

4. BLANKS

Were laboratory blanks analyzed? . . . . . **Yes** No N/A  
 Are laboratory blank results acceptable? . . . . . **Yes** No N/A  
 Were field/trip blanks analyzed? . . . . . Yes **No** N/A  
 Are field/trip blank results acceptable? . . . . . Yes No **N/A**

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . **Yes** No N/A  
 Are surrogate/System Monitoring Compound recoveries acceptable? **Yes** No N/A  
 Were MS/MSD samples analyzed? . . . . . **Yes** No N/A  
 Are MS/MSD results acceptable? . . . . . **Yes** **No** N/A

Comments: MSD - dichloro Benzene 30  
N-nitroso-Di-n-propylamine (138)  
1,2,4 trichloro benzene (33)  
~~4-chloro-3-methyl phenol (59)~~  
Acenaphthene (34)  
I - compound associated w/above + 2-Fluorodiphenyl (surrogate)  
1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, hexachloro ethane  
~~tetrachloroethane, tetrachlorobutadiene, pentachlorobutadiene, hexachlorobutadiene~~  
hexachlorocyclopentadiene, Benzodioxin, 3,3-dichlorobenzidine  
1,2,4-trichlorobenzene, hexachlorobenzene, 2-chloronaphthalene

Surrogate 2-Fluorodiphenyl - no good region even, see ~~MS/MSD~~

*A-2*

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes  No  N/A

Are field duplicate RPD values acceptable? . . . . . Yes  No  N/A

Are field split RPD values acceptable? . . . . . Yes  No  N/A

Comments: all but 4-microphthal out  
- 1-Di-n-butyl phthalate

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes  No  N/A

Are internal standard areas acceptable? . . . . . Yes  No  N/A

Are internal standard retention times acceptable? . . . . . Yes  No  N/A

Comments: \_\_\_\_\_

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes  No  N/A

Is compound quantitation acceptable? . . . . . Yes  No  N/A

Comments: \_\_\_\_\_

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . .  Yes  No  N/A

Are all results supported in the raw data? . . . . . Yes  No  N/A

Do results meet the CRQLs? . . . . . Yes  No  N/A

Has the laboratory properly identified and coded all TIC? . . . Yes  No  N/A

Comments: 48 out

WHC-SD-EN-SPP-002, Rev. 2  
HPLC  
GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	ERDF Delisty		DATA PACKAGE: H0338		
VALIDATOR:	LAB: QES		DATE: 3/16/99		
CASE:	SDG: H0338				
ANALYSES PERFORMED					
<input type="checkbox"/> 8010	<input type="checkbox"/> 8015	<input type="checkbox"/> 8020	<input type="checkbox"/> 8021	<input type="checkbox"/> 8140	<input type="checkbox"/> 8141
<input type="checkbox"/> 8150	<input type="checkbox"/> 8151	<input type="checkbox"/> WTPH-HCID	<input type="checkbox"/> WTPH-G	<input type="checkbox"/> WTPH-D	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> 830 PAHs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX: BOTL69 BOTL71					
Water					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **(N/A)**  
Is a case narrative present? . . . . . **(Yes)** No N/A  
Comments: \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . **(Yes)** No N/A  
Comments: \_\_\_\_\_

GENERAL GC DATA VALIDATION CHECKLIST

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. PRECISION

Are MS/MSD sample RPD values acceptable? . . . . .  Yes No N/A  
Are field duplicate RPD values acceptable? . . . . . Yes No  N/A  
Are field split RPD values acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No  N/A  
Is compound quantitation acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . .  Yes No N/A  
Are all results supported in the raw data? . . . . . Yes No  N/A  
Do results meet the CRQLs? . . . . . Yes  No N/A

Comments: ~~SD data~~ 1 over dibenzo(a,h)anthracene  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

A-12



Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: Wet Chemistry - Data Package No. H0338-RLN (SDG No. H0338)

## **INTRODUCTION**

This memo presents the results of data validation on Summary Data Package No. H0338-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOTL69	01/12/99	Water	C	See note 1 & 2
BOTL71	01/12/99	Water	C	See note 1 & 2

1 - IC Anions - 9056 (bromide, fluoride, nitrate, nitrite, sulfate); ammonia - 350.3; cyanide - 9010B; total organic carbon (TOC) - 9060; total dissolved solids (TDS) - 160.1; total suspended solids (TSS) - 160.2; specific conductance - 9050A, pH - 9040; sulphide - 9030; oil & grease - 9070.

2 - Phosphate by 9056 was requested but phosphate by 365.2 was reported.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 28 days for ammonia, phosphate, specific conductance, TOC, oil & grease, and IC anions (bromide, chloride, fluoride, and sulfate); 14 days for

000001

cyanide; 7 days for sulfide, TSS and TDS; 2 days for IC anion (nitrate and nitrite); and immediate for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than two times the limit, all pH results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by greater than two times the limit, all nitrate results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than two times the limit, all TDS results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than two times the limit, all TSS results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by greater than two times the limit, all nitrite results were qualified as rejected and flagged "UR".

Due to the oil and grease sampling being preserved with H<sub>2</sub>SO<sub>4</sub> instead of HCL (as required by the method), all oil and grease results were qualified as estimates and flagged "J".

Holding times were met for all other parameters and samples.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the CRQL to be acceptable.

All method blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 30% and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 35% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the PQL/CRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the PQL/CRQL and the sample concentration is less than five times the PQL/CRQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the PQL/CRQL or plus or minus the PQL/CRQL for positive sample results less than five times the PQL/CRQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate precision results were within the required control limits.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Environmental Restoration Disposal Facility Leachate Delisting Petition PQLs or the CRDL if no PQL was specified, to ensure that laboratory detection levels meet the required criteria. The reported detection limit for cyanide was above PQL/CRDL. All other reported laboratory detection levels met the analyte specific PQL/CRDL.

- **Completeness**

Data Package No. H0338-RLN (SDG No. H0338) was submitted for validation and verified for completeness. The completion rate was 93%.

### **MAJOR DEFICIENCIES**

Due to the holding time being exceeded by greater than two times the limit, all nitrite results were qualified as rejected and flagged "UR". Rejected data is unusable and should not be reported.

### **MINOR DEFICIENCIES**

Due to the holding time being exceeded by greater than two times the limit, all pH results were qualified as estimates and flagged "J". Due to the holding time being exceeded by greater than two times the limit, all nitrate results were qualified as estimates and flagged "J". Due to the holding time being exceeded by less than two times the limit, all TDS results were qualified as estimates and flagged "J". Due to the holding time being exceeded by less than two times the limit, all TSS results were qualified as estimates and flagged "J". Due to the oil and grease sampling being preserved with H<sub>2</sub>SO<sub>4</sub> instead of HCL (as required by the method), all oil and grease results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

000005

Qualifiers which may be applied by data validators in compliance with WHC procedures are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

**Appendix 2**  
**Summary of Data Qualification**

000007

DATA QUALIFICATION SUMMARY

SDG: H0338	REVIEWER: TLI	DATE: 3/22/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH, nitrate, TSS, TDS	J	All	Exceeded holding time
Nitrite	UR	All	Exceeded holding time
Oil and Grease	J	All	Used H <sub>2</sub> SO <sub>4</sub> instead of HCL for preservation

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**



Project: BECHTEL-HANFORD  
 Laboratory: Rebra LabNet

Case SDG: H0338

Sample Number BOTL69

Location ERDF

Remarks

BOTL71

ERDF

1/12/99

Sample Date	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
General Chemistry																				
Bromide	250	2.8	2.8	5 UR	120 J	1.1 UJ	1.1 UJ													
Fluoride	50	1.4	1.5	5 UR	10 U	8 J	8 J													
Nitrite	50	5 UR	5 UR																	
Nitrate	50	130 J	120 J																	
Cyanide	3.1	5 U	10 U																	
Sulfate	250	324	338																	
Ammonia	30	0.1 U	0.1 U																	
TOC	530	12.2	12.3																	
Oil & Grease	500	1.1 UJ	1.1 UJ																	
pH*	0.1	7.9 J	8 J																	
Phosphate	250	0.12	0.12																	
Sulfide		1 U	1 U																	
Specific Conductance**	0.15	1870	2100																	
TDS	4700	1600 J	1600 J																	
TSS	1000	5 UJ	5 UJ																	

\* Units are pH units

\*\* Units are UMHOS/CM

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 02/05/99

CLIENT: TNU-HANFORD B99-037  
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9901L860

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOTL69	Bromide by IC	2.8	MG/L	1.2	5.0
		Fluoride by IC	1.4	MG/L	0.50	1.0
		Nitrite by IC	5.0	MG/L	5.0	20 <i>UR</i>
		Nitrate by IC	130	MG/L	5.0	20 <i>J</i>
		Cyanide, Total	5.0	u UG/L	5.0	1.0
		Sulfate by IC	324	MG/L	25.0	100
		Ammonia, as N	0.10	u MG/L	0.10	1.0
		Total Organic Carbon	12.2	MG/L	0.50	1.0
		Oil & Grease Gravimetri	1.1	u MG/L	1.1	1.0 <i>J</i>
		pH	7.9	PH UNITS	0.01	1.0 <i>J</i>
		Phosphate, as P - Total	0.12	MG/L	0.050	1.0
		Sulfide	1.0	u MG/L	1.0	1.0
		Specific Conductance	1870	UMHOS/CM	1.0	1.0
		Total Dissolved Solids	1600	MG/L	5.0	1.0 <i>J</i>
		Total Suspended Solids	5.0	u MG/L	5.0	1.0 <i>J</i>
-002	BOTL71	Bromide by IC	2.8	MG/L	1.2	5.0
		Fluoride by IC	1.5	MG/L	0.50	1.0
		Nitrite by IC	5.0	MG/L	5.0	20 <i>UR</i>
		Nitrate by IC	120	MG/L	5.0	20 <i>J</i>
		Cyanide, Total	10	u UG/L	10	1.0
		Sulfate by IC	338	MG/L	25.0	100
		Ammonia, as N	0.10	u MG/L	0.10	1.0
		Total Organic Carbon	12.3	MG/L	0.50	1.0
		Oil & Grease Gravimetri	1.1	u MG/L	1.1	1.0 <i>J</i>
		pH	8.0	PH UNITS	0.01	1.0 <i>J</i>
		Phosphate, as P - Total	0.12	MG/L	0.050	1.0
		Sulfide	1.0	u MG/L	1.0	1.0
		Specific Conductance	2100	UMHOS/CM	1.0	1.0
		Total Dissolved Solids	1600	MG/L	5.0	1.0 <i>J</i>
		Total Suspended Solids	5.0	u MG/L	5.0	1.0 <i>J</i>

*DRP*  
 3/12/99

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

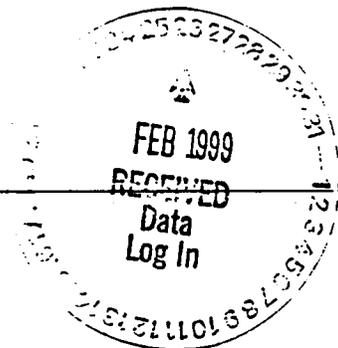
**000012**



**RECRA  
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



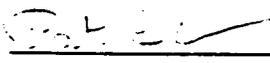
**Recra LabNet Philadelphia  
Analytical Report**

**Client :** TNU-HANFORD B99-037  
**RFW# :** 9901L860  
**SDG# :** H0338  
**SAF# :** B99-037

**W.O. # :** 10985-001-001-9999-00  
**Date Received:** 01-14-99

**INORGANIC CASE NARRATIVE**

1. This narrative covers the analyses of 2 water samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary. For NPDES samples: Ammonia distillations for method 350.3 were not performed as specified in 40 CFR part 136.
3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate, Nitrite and pH which were received past hold and Total Dissolved Solids and Total Suspended Solids which were prepared within hold, but analyzed past hold.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blanks were within method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries were within the 75-125% control limits.
8. The replicate analyses were within the 20% RPD control limit.

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

01-14-99  
Date

npi01-860

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 20 pages.

000013



B99-037-01

STANDARD CUSTOMER/SAMPLE ANALYSIS REQUEST

**Collector:** Doug Bowers/Renee Neilson  
**Project Designation:** FRDF 1 cache Delisting Analysis  
**For Chest No.:** ERC916-051, ERC916-052, ERC916-053  
**Shipped To:** FRDF (RA) RUN 1-13 99  
**Company Contact:** Fred Roock  
**Telephone No.:** 372-9086  
**Project Coordinator:** WEISS, RL  
**SAF No.:** B99-037  
**Method of Shipment:** Fed Ex  
**Bill of Lading/Air Bill No.:** 423579521413, 423579521424, 423579521435, 423579521446  
**COA:** TRDF4K117

99012860

SAMPLE ANALYSIS

Sample No	Matrix	Sample Date	Sample Time	HMDS to pH	ZnAc-NaOH to pH	NH <sub>4</sub> to pH	Coat #1	Coat #2	Coat #3	Coat #4	Coat #5	Coat #6	Coat #7	Coat #8	Coat #9	Coat #10
BOTL69	Water	1-12-99	0910	1	1	1	aG									
BOTL71	Water	1-12-99	0938	1	1	1	aG									

**CHAIN OF POSSESSION**  
 Received By: Doug Bowers Date Time: 1-13-99  
 Received By: Renee Neilson/R Nielson Date Time: 1-13-99  
 Received By: Fred Roock Date Time: 1-14-99  
 Received By: [Signature] Date Time: 1-14-99

**SPECIAL INSTRUCTIONS**  
 \*\* Close SIG upon receipt of samples  
 (1) ICP Metals - 6010A (AL), ICP Metals - 6010A (Add-on); Arsenic, Lead, Selenium, Silicon, Thallium, Tin;  
 (2) 810 SVDA 1191 C; Benzofuranone, Benzofuranone, Benzofuranone, Benzofuranone;  
 (3) Nitrosamines - 8070; N-Nitroso-di-n-propylamine, N-Nitrosodimethylamine;  
 (4) Semi-VDA - 820A (App IX), Semi-VDA - 820A (App IX Add On) (1, 2); Diphenylmethane 1,3-Dimethoxybenzene, 1-Acetyl-2,4-dimethoxy-3,5-Diaminobenzene, 2-Cyctohexyl-6-aminoethanol;  
 (5) Alcohols (Cyclohexyl & Ketones - 8015A); 1 Butanol, Diethyl Ether, Methylated;

**LABORATORY SECTION**  
 Received By: [Signature] Date Time: [Blank]  
**FINAL SAMPLE DISPOSITION**  
 Disposed By: [Signature] Date Time: [Blank]

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Collector: Doug Havers/Renee Neilson  
 Project Designation: (RDD) Leachate Dechlorination Analysis  
 Ice Chest No. ER2276-251  
 ERC 916-053 ERC 916-053 ERC FS 002  
 Shipped To: TREVILERA  
 RIV 1-13-99

Company Contact: Fred Kocak  
 Telephone No.: 372-9086  
 Project Coordinator: WHEISS, RI.  
 SAF No.: B99-037  
 Method of Shipment: Fed Ex  
 Price Code:  
 Date Returned: 029 1-12-99  
 45 Days  
 15 Day

Bill of Lading/Air Bill No.: 42357952 1413,  
 42357952 1424 42357952 1435, 42357952 1446  
 COA TERDF4K117

POSSIBLE SAMPLE HAZARDS/REMARKS

99012860

Special Handling and/or Storage: cool to 4C

SAMPLE ANALYSIS

Sample No	Matrix *	Sample Date	Sample Time	IC Code	IC Code	Preservation	Type of Container	No. of Container(s)	Volume	See item (1) in Special Instructions	Activity
BOTL69	Water	1-17-99	0910	Y	AGS			1	6.0 ml		
BOTL71	Water	1-17-99	0938	Y							
BOTL73	water	1-12-99	0700	Y							

CHAIN OF POSSESSION

Relinquished by: Doug Havers  
 Date Time: 1-13-99 1135  
 Received by: Renee Neilson  
 Date Time: 1-13-99 1135

Relinquished by: Renee Neilson  
 Date Time: 1-13-99 1300  
 Received by: Fred Kocak  
 Date Time: 1-14-99 1000

Relinquished by: Renee Neilson  
 Date Time: 1-14-99 1000  
 Received by: Fred Kocak  
 Date Time: 1-14-99 1000

SPECIAL INSTRUCTIONS  
 \*\* Close SIG upon receipt of samples

Matrix \*  
 Soil  
 Water  
 Vapor  
 Other Solid  
 Other Liquid

LABORATORY SECTION  
 Received by: Fred Kocak  
 Date Time: 1-14-99 1000

FINAL SAMPLE DISPOSITION  
 Disposed by: Fred Kocak  
 Date Time: 1-14-99 1000

**Appendix 5**

**Data Validation Supporting Documentation**

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT: ERDF Delisting			DATA PACKAGE: W0338		
VALIDATOR: JLI	LAB: <del>QES</del>		DATE: 3/4/99		
CASE:			SDG: W0336		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Anions/IC	<input checked="" type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	<input checked="" type="checkbox"/> Oil and Grease	Alkalinity
<input checked="" type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input checked="" type="checkbox"/> pH	<input type="checkbox"/> NO <sub>2</sub> /NO <sub>3</sub>
<input type="checkbox"/> Sulfate	<input checked="" type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input checked="" type="checkbox"/> Phosphate	<input checked="" type="checkbox"/> cyanide	<input checked="" type="checkbox"/> Sulphur
<input checked="" type="checkbox"/> TSS	<input checked="" type="checkbox"/> SC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX      BOTTLE      BOTTLE      water					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **(N/A)**  
 Is a case narrative present? . . . . . **(Yes)** No N/A  
 Comments: \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes **(No)** N/A

Comments: Nitrate, Nitrite + pH J/OR  
 TDS, TSS J/UT

- used H<sub>2</sub>SO<sub>4</sub> in oil + grease instead of HCL 'J'

Ammonia method? 365.2

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? Yes No N/A  
Are initial calibration results acceptable? . . . . . Yes No N/A  
Was a calibration check performed for all applicable analyses? Yes No N/A  
Are calibration check results acceptable? . . . . . Yes No N/A  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A  
Are laboratory blank results acceptable? . . . . . Yes No N/A  
Were field/trip blanks analyzed? . . . . . Yes No N/A  
Are field/trip blank results acceptable? . . . . . Yes No N/A  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . . Yes No N/A  
Are spike recoveries acceptable? . . . . . Yes No N/A  
Were LCS analyses performed at the required frequency? . . . . . Yes No N/A  
Are LCS recoveries acceptable? . . . . . Yes No N/A  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. PRECISION

Were laboratory duplicate samples analyzed  
at the required frequency? . . . . . Yes No N/A  
Are laboratory duplicate sample RPD values acceptable? . . . . . Yes No N/A  
Are field duplicate RPD values acceptable? . . . . . Yes No N/A  
Are field split RPD values acceptable? . . . . . Yes No N/A



HOLDING TIME SUMMARY

SDG: W0338		VALIDATOR: TLI	DATE: 3/4	PAGE	OF 1		
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
Bot 69	Nitrate	1/12/99	1/19/99	1/19/99	7	0	J/OR
Bot 71	Nitrite		1/19/99	1/19/99	7	0	J/OR
	Bromide		1/19/99	1/19/99	7	0	None
	Fluoride		1/19/99	1/19/99	7	0	None
	Sulfate		1/19/99	1/19/99	7	0	None
	Cyanide		1/20/99	1/20/99	8	0	None
	ammonia		1/21/99	1/21/99	9	0	None
	TOC		1/21/99	1/21/99	9	0	None
	O.I + ground		1/25/99	1/24/99	13	1	None
	Phosphate		1/27/99	1/27/99	15	0	J/OR None
	Sulfide		1/18/99	1/18/99	6	0	None
LU904	SR		2/13/99	2/13/99	24	0	None
	TDS		1/19/99	1/20/99	7	1	J/JS
	TSS		1/19/99	1/20/99	7	1	J/JS
	pH		1/14/99	1/14/99	2	0	J/OR
Bot 71	SC		1/19/99	1/19/99	7	0	None

COMMENTS:

B

Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: Volatiles - Data Package No. H0338-RLN (SDG No. H0338)

## **INTRODUCTION**

This memo presents the results of data validation on Summary Data Package No. H0338-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
BOTL69	01/12/99	Water	C	See note 1, 2 & 3
BOTL71	01/12/99	Water	C	See note 1, 2, & 3
BOTL73	01/12/99	Water	C	See note 1

- 1 - Volatiles by EPA 8260A (with add-ons).
- 2 - Alcohols (butanol and methanol) by 8015B and formaldehyde by 8315.
- 3 - Diethyl ether by 8015B was requested but not reported.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within 14 days of the date of sample collection for VOA and alcohols. Samples must be derivitized within 3 days and analyzed within 3 days for

000001

formaldehyde. If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by less than twice the limit, all formaldehyde results were qualified as estimates and flagged "J".

All other holding times were met.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the CRQL, qualified as undetected and flagged "U".

Due to laboratory blank contamination, the methylene chloride results in samples BOTL69 and BOTL71 were raised to the CRQL, qualified as undetected and flagged "U". Methylene chloride result for sample BOTL73 was not qualified "U" due to the sample being a trip blank.

All other method blank results were acceptable.

#### Trip Blanks

One trip blank (BOTL73) was submitted for analysis. Methylene chloride and 1,1,2-trichlorotrifluoroethane were detected above the PQL in the trip blank. Under the BHI statement of work, no qualification is required.

- Accuracy

#### Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the lack of a matrix spike/matrix spike duplicate analysis, all formaldehyde results were qualified as estimates and flagged "J".

All other matrix spike/matrix spike duplicate recovery results were acceptable.

#### Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

Due to the lack of a surrogate analysis, all butanol (8015B) and methanol results were qualified as estimates and flagged "J".

All other surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/- 20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a matrix spike/matrix spike duplicate analysis, a blank spike and bank spike duplicate were used to measure precision for the formaldehyde analysis.

All precision results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Environmental Restoration Disposal Facility Leachate Delisting Petition PQLs or the CRDL if no PQL was specified, to ensure that laboratory detection levels meet the required criteria. The following analytes had reported analytical detection levels above the analyte specific PQL/CRDL:

bromomethane	chloroethane
carbon disulfide	chloroform
carbon tetrachloride	bromodichloromethane
dibromochloromethane	benzene
bromoform	toluene
chlorobenzene	styrene
xylene	acrylonitrile
trichlorofluoromethane	dichlorodifluoromethane
n-butanol (8260)	methanol

Under the BHI validation SOW, no qualification is required.

- **Completeness**

Data package No. H0338-RLN (SDG No. H0338) was submitted for validation and verified for completeness. The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### **MINOR DEFICIENCIES**

Due to the lack of a surrogate analysis, all butanol (8015B) and methanol results were qualified as estimates and flagged "J". Due to the lack of a matrix spike/matrix spike duplicate analysis, all formaldehyde results were qualified as estimates and flagged "J". Due to the holding time being exceeded by less than twice the limit, all formaldehyde results were qualified as estimates and flagged "J". Due to laboratory blank contamination, the methylene chloride results in samples BOTL69 and BOTL71 were raised to the CRQL, qualified as undetected and flagged "U". Under the BHI statement of work, no qualification is required. Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.

**Appendix 1**

**Glossary of Data Reporting Qualifiers**

Qualifiers which may be applied by data validator in compliance with the BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications ( i.e., usable for decision-making purposes).

**Appendix 2**

**Summary of Data Qualification**

000008

DATA QUALIFICATION SUMMARY

SDG: H0338	REVIEWER: TLI	DATE: 3/22/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	BOTL69, BOTL71	Blank contamination
Butanol and methanol	J	All	No surrogate analysis
Formaldehyde	J	All	Holding time exceeded
Formaldehyde	J	All	No MS/MSD analysis

000009

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000010**

Project: BECHTEL-HANFORD		SDG: H0338	
Laboratory: RECRA LabNet			
Sample Number	BOTL69	BOTL71	BOTL73
Location	ERDF	ERDF	ERDF
Remarks		Trip Blank	
Sample Date	1/12/99	1/12/99	1/12/99
Analysis Date	1/25/99	1/25/99	1/25/99
VOA/Alcohols/Formaldehyde	CRQL	Q	Result
Chloromethane	10	10 U	10 U
Bromomethane	1.4	10 U	10 U
Vinyl Chloride	10	10 U	10 U
Chloroethane	1	10 U	10 U
Methylene Chloride	3.8	3.8 U	2
Acetone	10	10 U	10 U
Carbon Disulfide	0.74	5 U	5 U
1,1-Dichloroethene	10	5 U	5 U
1,1-Dichloroethane	10	5 U	5 U
cis-1,2-Dichloroethene	10	5 U	5 U
Chloroform	0.86	5 U	5 U
1,2-Dichloroethane	10	5 U	5 U
2-Butanone	10	10 U	10 U
1,1,1-Trichloroethane	10	5 U	5 U
Carbon Tetrachloride	0.71	5 U	5 U
Vinyl Acetate	10	10 U	10 U
Bromodichloromethane	0.5	5 U	5 U
1,2-Dichloropropane	10	5 U	5 U
cis-1,3-Dichloropropane	10	5 U	5 U
Trichloroethene	10	5 U	5 U
Dibromochloromethane	0.33	5 U	5 U
1,1,2-Trichloroethane	10	5 U	5 U
Benzene	0.84	5 U	5 U
trans-1,3-Dichloropropene	10	5 U	5 U
Bromoform	0.36	5 U	5 U
4-Methyl-2-pentanone	10	10 U	10 U
2-Hexanone	10	10 U	10 U
Tetrachloroethene	10	5 U	5 U
1,1,2,2-Tetrachloroethane	10	5 U	5 U
Toluene	0.79	5 U	5 U
Chlorobenzene	0.75	5 U	5 U
Ethylbenzene	1.3	5 U	5 U
Styrene	0.64	5 U	5 U
Xylenes (total)	0.71	5 U	5 U
Acrolein	21.4	20 U	20 U
Acrylonitrile	1.7	5 U	5 U
Trichlorofluoromethane	2	5 U	5 U

Project: BECHTEL-HANFORD  
 Laboratory: RECRA LabNet  
 Case: SDG: H0338

Sample Number	B0TL69		B0TL71		B0TL73	
	ERDF	ERDF	ERDF	ERDF	ERDF	ERDF
Location						
Remarks						
Sample Date	1/12/99	1/12/99	1/12/99	1/12/99	1/12/99	1/12/99
Analysis Date	1/25/99	1/25/99	1/25/99	1/25/99	1/25/99	1/25/99
VOA/Alcohol/Formaldehyde	CRQL	Result	Q	Result	Q	Result
Dichlorodifluoromethane	2.3	10 U				
Acetonitrile	23.5	20 U				
Idomethane		5 U	5 U	5 U	5 U	5 U
Propionitrile (ethyl cyanide)		50 U				
3-Chloropropene		10 U				
Methacrylonitrile		10 U				
Dibromomethane		10 U				
Isobutyl Alcohol		100 U				
1,2-Dibromoethane		10 U				
1,1,1,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U
1,2,3-Trichloropropane		10 U				
trans-1,4-Dichloro-2-butene		20 U				
1,2-Dibromo-3-chloropropane		10 U				
2-Chloro-1,3-butadiene		5 U	5 U	5 U	5 U	5 U
2-Chloroethylvinylether		10 U				
1,1,2-Trichlorofluoroethane		10 U	10 U	10 U	0.7	10 U
Ethyl Acetate		10 U				
Diethyl Ether		10 U				
n-Butanol	13	250 U				
Alcohols by 8015B						
Butanol*		6.5 UJ	6.5 UJ	6.5 UJ	NA	NA
Methanol*	5	5.6 UJ	5.6 UJ	5.6 UJ	NA	NA
Formaldehyde by 8315						
Formaldehyde	5000	12 UJ	12 UJ	12 UJ	NA	NA
* - MGL						
NA = Not Analyzed						

Recra LabNet - Lionville Laboratory  
 Volatiles by GC/MS, Appendix IX List

RFW Batch Number: 9901L860

Client: TNU-HANFORD B99-037

Report Date: 02/02/99 09:32  
 Work Order: 10985001001 Page: 1a

Sample Information	Cust ID:	B0TL69	B0TL71	B0TL73	B0TL73	B0TL73	VBLKRQ
RFW#:	001	002	003	003 MS	003 MSD	003 MS	
Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	

Surrogate	93 %	93 %	94 %	90 %	100 %	94 %	94 %
1,2-Dichloroethane-d4	10 U	10 U	10 U				
Toluene-d8	10 U	10 U	10 U				
Bromofluorobenzene	10 U	10 U	10 U				
Chloromethane	10 U	10 U	10 U				
Bromomethane	10 U	10 U	10 U				
Vinyl Chloride	10 U	10 U	10 U				
Chloroethane	10 U	10 U	10 U				
Methylene Chloride	10 U	10 U	10 U				
Acetone	10 U	10 U	10 U				
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	10 U	10 U	10 U				
Carbon Tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10 U	10 U	10 U				
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	10 U	10 U	10 U				
2-Hexanone	10 U	10 U	10 U				
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U

3.8 ~~U~~ U 3.8 ~~U~~ U

000013

3/15/99

\* = Outside of EPA CLP QC limits.

RFW#	001	002	003	003 MS	003 MSD	99LVX004-MB1
1,1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	98 %	99 %	5 U
Chlorobenzene	5 U	5 U	5 U	96 %	96 %	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U	5 U
Acrolein	5 U	5 U	5 U	5 U	5 U	5 U
Acrylonitrile	20 U	20 U	20 U	20 U	20 U	20 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	5 U	5 U	5 U	5 U	5 U	5 U
Acetonitrile	10 U	10 U	10 U	10 U	10 U	10 U
Iodomethane	20 U	20 U	20 U	20 U	20 U	20 U
Propionitrile (Ethyl Cyanide)	5 U	5 U	5 U	5 U	5 U	5 U
3-Chloropropene	50 U	50 U	50 U	50 U	50 U	50 U
Methacrylonitrile	10 U	10 U	10 U	10 U	10 U	10 U
Dibromomethane	10 U	10 U	10 U	10 U	10 U	10 U
Isobutyl alcohol	100 U	100 U	100 U	100 U	100 U	100 U
1,2-Dibromoethane	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-Trichloropropane	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,4-Dichloro-2-butene	20 U	20 U	20 U	20 U	20 U	20 U
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloro-1,3-Butadiene	5 U	5 U	5 U	5 U	5 U	5 U
2-Chloroethylvinylether	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorotrifluoroethane	10 U	10 U	10 U	10 U	10 U	10 U
Ethyl acetate	10 U	10 U	0.7 J	3 J	2 J	10 U
Diethylether	10 U	10 U	10 U	10 U	10 U	10 U
N-Butanol	10 U	10 U	10 U	10 U	10 U	10 U
	250 U	250 U	250 U	250 U	250 U	250 U

\* = Outside of EPA CLP QC limits.

*PKR*  
 5/15/99

RFW Batch Number: 9901L860

Sample Information	Cust ID:	BOTL69	BOTL69	BOTL69	BOTL71	BLK	BLK BS
RFW#:	001	001 MS	001 MSD	002			
Matrix:	WATER	WATER	WATER	WATER			
D.F.:	1.00	1.00	1.00	1.00			
Units:	mg/L	mg/L	mg/L	mg/L			

Methanol	6.5 U J	103 %	105 %	6.5 U J	6.5 U	102 %
Butanol	5.6 U J	99 %	102 %	5.6 U J	5.6 U	99 %

*DL 1/29/99*

000015

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

*DL*  
*3/19/99*

Recra LabNet - Lionville Laboratory

RFW Batch Number: 9901L860

Client: TNU-HANFORD B99-037

Report Date: 01/20/99 12:33

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

Page: 3

Cust ID:	B0TL69	B0TL71	BLK	BLK BS	BLK BSD
RFW#:	001	002	99LLC004-MB1	99LLC004-MB1	99LLC004-MB1
Matrix:	WATER	WATER	WATER	WATER	WATER
D.F.:	1.00	1.00	1.00	1.00	1.00
Units:	ug/L	ug/L	ug/L	ug/L	ug/L

=====  
 Formaldehyde 12 U J 12 U J 12 U 111 % 111 %  
 =====f1=====f1=====f1=====f1=====f1=====f1=====f1=====

*Handwritten signature*

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

*Handwritten signature*  
 3/19/99

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**



**RECRA  
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

FEB 1999  
RECEIVED  
Data  
Log In

**Recra LabNet Philadelphia  
Analytical Report**

**Client :** TNU-HANFORD B99-037  
**RFW# :** 9901L860  
**SDG/SAF #:** H0338/ B99-037

**W.O. #:** 10985-001-001-9999-00  
**Date Received:** 01-14-99

**GC/MS VOLATILE**

Three (3) water samples were collected on 01-12-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 01-25-99.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. Non-target compounds were not detected in these samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.
8. A spectral search was conducted for the compounds 1,3-Butadiene, Allyl Alcohol, Crotonaldehyde, Dichloropropanol, and Isopropanol; these compounds were not identified in these samples.

*J. Michael Taylor*

J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory

son\group\data\voa\tnu01860.doc

01-03-99  
Date

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.

000018

*001*



**RECRA  
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

FEB 1999  
RECEIVED  
Data  
Log In

**Recra LabNet Philadelphia  
Analytical Report**

**Client : TNU-HANFORD**  
**RFW# : 9901L860**  
**SDG/SAF#: H0338/B99-037**

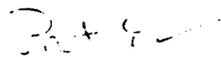
**W.O #:** 10985-001-001-9999-00  
**Date Received:** 01-14-99

**GC SCAN**

The set of samples consisted of two (2) water samples collected on 01-12-99.

The samples and their associated QC samples were prepared on 01-20-99 and analyzed by methodology based on EPA Method 8015B for Methanol and Butanol on 01-20-99.

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for analysis were met.
3. All initial calibrations associated with this data set were within acceptance criteria.
4. Continuing calibration criteria were met for all continuing calibration verification standards analyzed prior to the samples.
5. Surrogates were not used in this analysis.
6. All blank spike recoveries were within acceptance criteria of 50%-150%.
7. All matrix spike recoveries were within acceptance criteria of 50%-150%.

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

2-5-99  
Date

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**000019**

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 5 pages.





**RECRA  
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

FEB 1999  
RECEIVED  
Data  
Log In

**Recra LabNet Philadelphia  
Analytical Report**

**Client :** TNU-HANFORD  
**RFW# :** 9901L860  
**SDG/SAF#:** H0338/B99-037

**W.O #:** 10985-001-001-9999-00  
**Date Received:** 01-14-99

**FORMALDEHYDE**

The set of samples consisted of two (2) water samples collected 01-12-99.

The samples and their associated QC samples were prepared on 01-15-99 and analyzed by EPA Method 8315 for Aldehydes and Ketones on 01-18-99.

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

1. All required holding times for extraction and analysis were met.
2. All blank spike recoveries were within advisory limits (50%-150%).
3. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
4. Surrogates were not used in this analysis.
5. Matrix QC was not performed on this sample set. A copy of the Sample Discrepancy Report (SDR) has been enclosed in the data package.

*J. Michael Taylor*

J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory

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2-5-99  
Date

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

000020

001

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Bechtel Hanford Inc.  
 Collector: Doug Bowers/Renee Neilson  
 Project Designation: TRDI Leachate Delisting Analysis  
 Fee Check No.: EPC 516-055  
 EPC 916-053, EPC 916-052, EPC 915-002  
 Shipped To: TARA/RCRA  
 RN 1-13-99

Company Contact: Fred Rueck  
 Telephone No.: 372-9086  
 Project Coordinator: WEISS, RL  
 SAF No.: B99-037  
 Method of Shipment: Fed Ex  
 Bill of Lading/Air Bill No.: 423579521413,  
 423579521434, 423579521415, 423579521441  
 COA TERDFK117

Preservation: None  
 Type of Container: 1  
 No. of Container(s): 125ml.  
 Volume: 0.25 L  
 Special Handling and/or Storage: cool to 4C

POSSIBLE SAMPLE HAZARDS/REMARKS  
 99012860

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	IC for H2SO4 to pH < 2 (Cool)	Cool AC	Cool AC	COND to pH 2	Cool AC	H2SO4 to pH < 2 Cool IC				
BOTL69	Water	1-13-99	0910	X	X	X	X	X	X	X	X	X	X
BOTL71	Water	1-13-99	0738	X	X	X	X	X	X	X	X	X	X

SPECIAL INSTRUCTIONS  
 \*\* Close SDG upon receipt of samples  
 (1) IC Anions - 9056 (Bromide, Fluoride, Nitrate, Nitrite Phosphate Sulfate)

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-13-99 1135	Rou Nielsen	1-13-99
Rou Nielsen	1-13-99 0930	Fred Rueck	1-14-99 1000

LABORATORY SECTION Received By: [Signature]  
 FINAL SAMPLE DISPOSITION Disposed By: [Signature]



**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Company Contact: Fred Rueck, Telephone No. 372-9086  
 Project Coordinator: W.F.S.S. RI.  
 Sampling Location: FRED (200 west)  
 Field Logbook No. FEL 1133-7  
 Offsite Property No. A990861

Collector: Doug Howers/Renee Nielson  
 Project Designation: ERD Leachmic Debiting Analysis  
 Site Check No. ER096-251  
 ERC 96-053, ERC 96-052, ERC FS 002  
 Shipped To: TOWN CRA, RN 1-13-99

Bill of Lading/Air Bill No. 423579521413, 423579521424, 423579521435, 423579521441  
 COA TERDF4K117

Sample No.	Matrix *	Date Time	Sign/Print Names	SPECIAL INSTRUCTIONS		Matrix *
				Received By	Date Time	
B01L69	Water	1-13-99	Renee Nielson	1-13-99	1135	
B01L71	Water	1-12-99	Renee Nielson	1-12-99		
B01L73	Water	1-12-99	Renee Nielson	1-12-99		

POSSIBLE SAMPLE HAZARDS/REMARKS: 9901860

SPECIAL HANDLING AND/OR STORAGE: cool to 4C

SAMPLE ANALYSIS

CHAIN OF POSSESSION	Received By	Date Time	Received By	Date Time
Relinquished by Doug Howers	Renee Nielson	1-13-99	Renee Nielson	1-13-99
Relinquished by Doug Howers	Renee Nielson	1-13-99	Renee Nielson	1-13-99
Relinquished by Doug Howers	Renee Nielson	1-13-99	Renee Nielson	1-13-99

LABORATORY SECTION Received By: [Signature] Date Time: 1/14/99 1000

FINAL SAMPLE DISPOSITION Disposed By: [Signature] Date Time: [Blank]

**Appendix 5**

**Data Validation Supporting Documentation**

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: ERDF Delist			DATA PACKAGE: H0338		
VALIDATOR: TLI		LAB: <del>QES</del> RLN		DATE: 3/4/99	
CASE:			SDG: H0338		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input checked="" type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	BOTL69	BOTL71	BOTL73	water	
			(FB)		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A  
 Is a case narrative present? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No ~~N/A~~

Comments: methylene chloride - run to PQL + U (10)  
PQL CRAC (3.8)

~~F/T/B~~ - Trip Blank Methylene Chloride +  
 1,1,2-trichlorotrifluoroethane

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . .  Yes No N/A  
Are field duplicate RPD values acceptable? . . . . . Yes No  N/A  
Are field split RPD values acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No  N/A  
Are internal standard areas acceptable? . . . . . Yes No  N/A  
Are internal standard retention times acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No  N/A  
Is compound quantitation acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . .  Yes  No  N/A  
Are all results supported in the raw data? . . . . . Yes No  N/A  
Do results meet the CRQLs? . . . . . Yes  No  N/A  
Has the laboratory properly identified and coded all TIC? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
- 17 out - PQLs  
\_\_\_\_\_  
~~Diestyl Ethn requested but not reported~~ 80154  
\_\_\_\_\_

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	ERDF delist		DATA PACKAGE: H0338		
VALIDATOR:	TLI	LAB: QES	DATE: 3/4/29		
CASE:			SDG: H0338		
ANALYSES PERFORMED					
<input type="checkbox"/> 8010	<input checked="" type="checkbox"/> 8015	<input type="checkbox"/> 8020	<input type="checkbox"/> 8021	8140	8141
<input type="checkbox"/> 8150	<input type="checkbox"/> 8151	<input type="checkbox"/> WTPH-HCID	<input type="checkbox"/> WTPH-G	<input type="checkbox"/> WTPH-D	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX:	BOTTLE 6		BOTTLE 7		water

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **N/A**

Is a case narrative present? . . . . . **Yes** No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . **Yes** No N/A

Comments: 8 days F/VE (unpreserved)

8 days extract (2k)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

GENERAL GC DATA VALIDATION CHECKLIST

Comments: method calls for surrogates - J/UT

---

---

---

6. PRECISION

Are MS/MSD sample RPD values acceptable? . . . . .  Yes No  N/A  
Are field duplicate RPD values acceptable? . . . . . Yes No  N/A  
Are field split RPD values acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_

---

---

---

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No  N/A  
Is compound quantitation acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_

---

---

---

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . .  Yes  No  N/A  
Are all results supported in the raw data? . . . . . Yes No  N/A  
Do results meet the CRQLs? . . . . . Yes  No  N/A

Comments: did not report di-ethyl ether  
Methanol over

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WHC-SD-EN-SPP-002, Rev. 2  
 HPLC  
 GENERAL-~~GG~~-DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT: ERDF Delisting			DATA PACKAGE: H0338		
VALIDATOR: TLI		LAB: AF		DATE: 3/16/99	
CASE:			SDG: H0338		
ANALYSES PERFORMED					
<input type="checkbox"/> 8010	<input type="checkbox"/> 8015	<input type="checkbox"/> 8020	<input type="checkbox"/> 8021	8140	8141
<input type="checkbox"/> 8150	<input type="checkbox"/> 8151	<input type="checkbox"/> WTPH-HCID	<input type="checkbox"/> WTPH-G	<input type="checkbox"/> WTPH-D	<input type="checkbox"/>
<input type="checkbox"/>	<del>8152</del>	<input checked="" type="checkbox"/> 8315	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX: (Formaldehyde)					
BOTTLE 6 BOTTLE 7					
water					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **N/A**  
 Is a case narrative present? . . . . . **Yes** No N/A  
 Comments: \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes **No** N/A  
 Comments: 3 days to prep  
4 days to analyze - J/UT

A-10

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No N/A

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No N/A

Are %D values for calibration or response factors acceptable? . Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD recoveries acceptable? . . . . . Yes No N/A

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

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GENERAL GC DATA VALIDATION CHECKLIST

Comments: J/OJ cell - no MS

6. PRECISION

- Are MS/MSD sample RPD values acceptable? . . . . .  Yes No  N/A
- Are field duplicate RPD values acceptable? . . . . .  Yes No  N/A
- Are field split RPD values acceptable? . . . . .  Yes No  N/A

Comments: used blank spets/ BSD

7. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? . . . . .  Yes No  N/A
- Is compound quantitation acceptable? . . . . .  Yes No  N/A

Comments: \_\_\_\_\_

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? . . . . .  Yes No  N/A
- Are all results supported in the raw data? . . . . .  Yes No  N/A
- Do results meet the CRQLs? . . . . .  Yes No  N/A

Comments: \_\_\_\_\_





Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: Inorganics - Data Package No. H0338-RLN (SDG No. H0338)

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. H0338-RLN prepared by Recla LabNet (RLN). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOTL69	1/12/99	Water	C	See note 1
BOTL71	1/12/99	Water	C	See note 1

1- ICP metals by 6010B; mercury by 7470A.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

Analytical holding times for chromium mercury and ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within six (6) months for ICP metals; and 28 days for mercury.

All holding times were acceptable.

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- **Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations (in ug/L) less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to positive preparation blank contamination, the beryllium, copper and zinc results in sample BOTL69 were qualified as undetected and flagged "U".

Due to positive preparation blank contamination, the beryllium and copper results in sample BOTL71 were qualified as undetected and flagged "U".

All other preparation blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 25% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery of 126%, potassium results in all samples were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 145%, silicon results in all samples were qualified as estimates and flagged "J".

All other matrix spike recovery results were acceptable.

- **Precision**

- Laboratory Duplicate Samples

- Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

- All laboratory duplicate results were acceptable.

- **Analytical Detection Levels**

- Reported analytical detection levels are compared against the Environmental Restoration Disposal Facility Leachate Delisting Petition, (DOE/RL-98-47) PQLs (or against the CRDLs if no PQL was available) to ensure that laboratory detection levels meet the required criteria. The reported detection limit for mercury and copper were above the PQL/CRDL. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL/CRDL.

- **Completeness**

- Data package No. H0338 was submitted for validation and verified for completeness. The completion percentage was 100%.

## **MAJOR DEFICIENCIES**

None found.

## **MINOR DEFICIENCIES**

Due to a matrix spike recovery of 126%, potassium results in all samples were qualified as estimates and flagged "J". Due to a matrix spike recovery of 145%, silicon results in all samples were qualified as estimates and flagged "J". Due to positive preparation blank contamination, the beryllium, copper and zinc results in sample BOTL69 were qualified as undetected and flagged "U". Due to positive preparation blank contamination, the beryllium and copper results in sample BOTL71 were qualified as undetected and flagged "U". Under the BHI statement of work, no qualification is required. Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

## **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

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Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

**Appendix 2**  
**Summary of Data Qualification**

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DATA QUALIFICATION SUMMARY

SDG: H0338	REVIEWER: TLI	DATE: 3/22/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Beryllium, copper, zinc	U	BOTL69	Blank contamination
Beryllium, copper	U	BOTL71	Blank contamination
Potassium, silicon	J	All	Matrix spike above QC limits

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

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Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/28/99

CLIENT: TNU-HANFORD B99-037

RECRA LOT #: 9901L860

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0TL69	Silver, Total	0.90	u UG/L	0.90	1.0
		Aluminum, Total	17.8	u UG/L	17.8	1.0
		Arsenic, Total	14.9	UG/L	3.3	1.0
		Barium, Total	64.6	UG/L	0.10	1.0
		Beryllium, Total	0.12	UG/L	0.10	1.0 U
		Calcium, Total	158000	UG/L	6.8	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Cobalt, Total	0.60	u UG/L	0.60	1.0
		Chromium, Total	14.1	UG/L	0.60	1.0
		Copper, Total	6.4	UG/L	0.90	1.0 U
		Iron, Total	17.9	u UG/L	17.9	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Potassium, Total	23900	UG/L	11.8	1.0 - J
		Magnesium, Total	47700	UG/L	6.2	1.0
		Manganese, Total	0.20	u UG/L	0.20	1.0
		Sodium, Total	258000	UG/L	31.6	1.0
		Nickel, Total	6.3	UG/L	1.1	1.0
		Lead, Total	1.8	u UG/L	1.8	1.0
		Antimony, Total	2.3	u UG/L	2.3	1.0
		Selenium, Total	3.6	u UG/L	3.6	1.0
		Silicon, Total	16900	UG/L	5.6	1.0 - J
		Tin, Total	2.7	u UG/L	2.7	1.0
		Thallium, Total	4.0	UG/L	3.7	1.0
		Vanadium, Total	25.9	UG/L	0.60	1.0
		Zinc, Total	1.0	UG/L	0.80	1.0 U

*PM*  
3/14/99

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Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/28/99

CLIENT: TNU-HANFORD B99-037

RECRA LOT #: 9901L860

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	BOTL71	Silver, Total	0.90	u UG/L	0.90	1.0
		Aluminum, Total	21.5	UG/L	17.8	1.0
		Arsenic, Total	14.4	UG/L	3.3	1.0
		Barium, Total	64.2	UG/L	0.10	1.0
		Beryllium, Total	0.16	UG/L	0.10	1.0 U
		Calcium, Total	159000	UG/L	6.8	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Cobalt, Total	0.60	u UG/L	0.60	1.0
		Chromium, Total	15.7	UG/L	0.60	1.0
		Copper, Total	6.7	UG/L	0.90	1.0 U
		Iron, Total	17.9	u UG/L	17.9	1.0
		Mercury, Total	0.10	u UG/L	0.10	1.0
		Potassium, Total	24100	UG/L	11.8	1.0 - J
		Magnesium, Total	47800	UG/L	6.2	1.0
		Manganese, Total	0.20	u UG/L	0.20	1.0
		Sodium, Total	260000	UG/L	31.6	1.0
		Nickel, Total	6.1	UG/L	1.1	1.0
		Lead, Total	1.8	u UG/L	1.8	1.0
		Antimony, Total	2.3	u UG/L	2.3	1.0
		Selenium, Total	3.6	u UG/L	3.6	1.0
		Silicon, Total	17000	UG/L	5.6	1.0 - J
		Tin, Total	2.7	u UG/L	2.7	1.0
		Thallium, Total	3.7	u UG/L	3.7	1.0
		Vanadium, Total	26.3	UG/L	0.60	1.0
		Zinc, Total	0.80	u UG/L	0.80	1.0

*JMK*  
5/19/99

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*rad*

**Appendix 4**

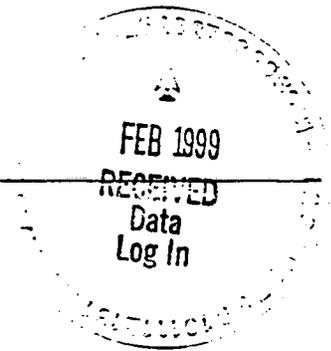
**Laboratory Narrative and Chain-of-Custody Documentation**



RECRA  
LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



**Recra LabNet Philadelphia  
Analytical Report**

**Client :** TNU HANFORD B99-037  
**RFW# :** 9901L860  
**SDG/SAF# :** H0338/B99-037

**W.O.# :** 10985-001-001-9999-00  
**Date Received:** 01-14-99

**METALS CASE NARRATIVE**

1. This narrative covers the analyses of 2 water samples.
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. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks were within method criteria (less than the PQL or samples greater than 20X MB value) with the exception of Zinc. Refer to the Inorganics Method Blank Data Summary.
  - a.) The MB result for Zinc was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample BOTL71 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample result was 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. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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AAK

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
BOTL69	Potassium	20,000	121.5
	Silicon	5,000	86.2

12. The duplicate analyses for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

J. Michael Taylor

J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory

mld/m01-860

1-29-99  
Date



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**Appendix 5**  
**Data Validation Supporting Documentation**



INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are ICP interference checks acceptable? . . . . . Yes No N/A

Were ICV and CCV checks performed on all instruments? . . . . Yes No N/A

Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A

Are ICB and CCB results acceptable? . . . . . Yes No N/A

Were preparation blanks analyzed? . . . . . Yes No N/A

Are preparation blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Be, Cu, Zn - Ca - U

Be, Cu, Zn - U

\_\_\_\_\_

\_\_\_\_\_

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A

Are spike sample recoveries acceptable? . . . . . Yes No N/A

Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A

Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_

K - 12690 J detects

Silica - 145 J detects

\_\_\_\_\_

\_\_\_\_\_

A-16

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . .	<input checked="" type="radio"/> Yes	No	N/A
Are laboratory duplicate samples RPD values acceptable? . . . . .	<input checked="" type="radio"/> Yes	No	N/A
Were ICP serial dilution samples analyzed? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are ICP serial dilution %D values acceptable? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are field duplicate RPD values acceptable? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are field split RPD values acceptable? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A

Comments: check IR ✓

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are duplicate injection %RSD values acceptable? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Were analytical spikes performed as required? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are analytical spike recoveries acceptable? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Was MSA performed as required? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are MSA results acceptable? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A

Comments: \_\_\_\_\_

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . .	<input checked="" type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are all results supported in the raw data? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Are results calculated properly? . . . . .	<input type="radio"/> Yes	No	<input checked="" type="radio"/> N/A
Do results meet the CRDLs? . . . . .	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: Mercury - over Copper as over

HOLDING TIME SUMMARY

SDG: H0338		VALIDATOR: TLL	DATE: 3/5/99	PAGE: 1	OF: 1		
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BOTL69	Hg	1/2/99	1/21/99	1/22/99	8	1	None
BOTL71	"	"	1/21/99	1/22/99	8	1	None
BOTL69	ICP	"	1/20/99	1/21/99	7	1	None
BOTL71	"	"	1/20/99	1/21/99	7	1	None

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/28/99

CLIENT: TNU-HANFORD B99-037

RECRA LOT #: 9901L860

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0032-MB1	Silver, Total	0.90	u UG/L	0.90	1.0
		Aluminum, Total	17.8	u UG/L	17.8	1.0
		Arsenic, Total	3.3	u UG/L	3.3	1.0
		Barium, Total	0.33	UG/L	0.10	1.0
		Beryllium, Total	0.11	UG/L	0.10	1.0
		Calcium, Total	50.1	UG/L	6.8	1.0
		Cadmium, Total	0.40	u UG/L	0.40	1.0
		Cobalt, Total	0.60	u UG/L	0.60	1.0
		Chromium, Total	0.60	u UG/L	0.60	1.0
		Copper, Total	1.8	UG/L	0.90	1.0
		Iron, Total	179	UG/L	17.9	1.0
		Potassium, Total	13.2	UG/L	11.8	1.0
		Magnesium, Total	32.4	UG/L	6.2	1.0
		Manganese, Total	1.0	UG/L	0.20	1.0
		Sodium, Total	118	UG/L	31.6	1.0
		Nickel, Total	1.1	u UG/L	1.1	1.0
		Lead, Total	1.8	u UG/L	1.8	1.0
		Antimony, Total	2.3	u UG/L	2.3	1.0
		Selenium, Total	3.6	u UG/L	3.6	1.0
		Silicon, Total	10.0	UG/L	5.6	1.0
		Tin, Total	2.7	u UG/L	2.7	1.0
		Thallium, Total	3.7	u UG/L	3.7	1.0
		Vanadium, Total	0.60	u UG/L	0.60	1.0
		Zinc, Total	3.0	UG/L	0.80	1.0
BLANK1	99C0016-MB1	Mercury, Total	0.10	u UG/L	0.10	1.0
BLANK2	99C0016-MB2	Mercury, TCLP Leachate	0.10	u UG/L	0.10	1.0

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Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/28/99

CLIENT: TNV-HANFORD B99-037

RECRA LOT #: 9901L860

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	BOTL69	Silver, Total	51.1	0.90u	50.0	102.2	1.0
		Aluminum, Total	2120	17.8 u	2000	106.1	1.0
		Arsenic, Total	2100	14.9	2000	104.3	1.0
		Barium, Total	2020	64.6	2000	97.9	1.0
		Beryllium, Total	50.7	0.12	50.0	101.2	1.0
		Calcium, Total	187000	158000	25000	115.1*	1.0
		Cadmium, Total	47.6	0.40u	50.0	95.2	1.0
		Cobalt, Total	485	0.60u	500	97.0	1.0
		Chromium, Total	212	14.1	200	99.1	1.0
		Copper, Total	260	6.4	250	101.5	1.0
		Iron, Total	984	17.9 u	1000	98.4	1.0
		Potassium, Total	55500	23900	25000	126.5	1.0
		Magnesium, Total	74100	47700	25000	105.4	1.0
		Manganese, Total	512	0.20u	500	102.5	1.0
		Sodium, Total	280000	258000	25000	86.8*	1.0
		Nickel, Total	482	6.3	500	95.1	1.0
		Lead, Total	485	1.8 u	500	97.1	1.0
		Antimony, Total	518	2.3 u	500	103.5	1.0
		Selenium, Total	2140	3.6 u	2000	106.8	1.0
		Silicon, Total	18300	16900	1000	145.2*	1.0
		Tin, Total	990	2.7 u	1000	99.0	1.0
		Thallium, Total	1970	4.0	2000	98.5	1.0
		Vanadium, Total	540	25.9	500	102.8	1.0
		Zinc, Total	498	1.0	500	99.5	1.0

000025

NAK

Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: PCBs, Pesticides and Herbicides - Data Package No. H0338-RLN (SDG No. H0338)

## INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0338-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOTL69	1/12/99	Water	C	See note 1 & 2
BOTL71	1/12/99	Water	C	See note 1 & 2

1 - Pesticides/PCBs by 8081 and herbicides by 8151.

2 - PCBs were not analysed by EPA method 8082 (as stated in the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B) but by an equivalent method (EPA 8081)

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Water samples must be extracted within 7 days of the date of sample

000001

collection and analyzed within 40 days from the date of extraction (extraction holding time applies to 8081 only).

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all nondetects are rejected and flagged "UR".

Due to the holding time being exceeded by less than two times the limit, all herbicide (8151) results were qualified as estimates and flagged "J".

All other holding times were met.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be within control limits of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike results were acceptable.

000002

## Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

### Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. The RPD for liquid samples is  $\leq 20\%$  and  $\leq 35\%$  for soils. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Environmental Restoration Disposal Facility Leachate Delisting Petition PQLs or the CRDL if no PQL was specified, to ensure that laboratory detection levels meet the required criteria. The following analytes had laboratory reported detection limits above the analyte specific PQLs/CRDLs:

alpha-BHC	beta-BHC	heptachlor
aldrin	toxaphene	dieldrin
4,4'-DDE	endrin	4,4'-DDD
4,4'-DDT	gamma-BHC (lindane)	heptachlor epoxide

Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL or CRDL.

- **Completeness**

Data Package No. H0338-RLN (SDG No. H0338) was submitted for validation and verified for completeness. The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### **MINOR DEFICIENCIES**

Due to the holding time being exceeded by less than two times the limit, all herbicide (8151) results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

#### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.

**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

**000005**

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

**Appendix 2**  
**Summary of Data Qualification**

**000007**

DATA QUALIFICATION SUMMARY

SDG: H0338	REVIEWER: TLI	DATE: 3/22/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Herbicides (8151)	J	All	Holding time exceeded

000008

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

Project: BECHTEL-HANFORD		SDG: H0338		BOTL69		BOTL71	
Laboratory: Rebra LabNet							
Case	Sample Number	Location	Sample Date	CRDL	Q	Result	Q
	Alpha-BHC		01/12/99	0.006	0.05	U	
	Beta-BHC			0.019	0.05	U	
	Delta-BHC			0.009	0.05	U	
	Gamma-BHC (Lindane)			0.011	0.05	U	
	Heptachlor			0.01	0.05	U	
	Aldrin			0.005	0.05	U	
	Heptachlor Epoxide			0.005	0.05	U	
	Endosulfan I			0.008	0.1	U	
	Dieldrin			0.005	0.1	U	
	4,4'-DDE			0.005	0.1	U	
	Endrin			0.005	0.1	U	
	Endosulfan II			0.007	0.1	U	
	4,4'-DDD			0.01	0.1	U	
	Endosulfan Sulfate			0.01	0.1	U	
	4,4'-DDT			0.01	0.1	U	
	Methoxychlor			0.5	0.5	U	
	Endrin Ketone			0.1	0.1	U	
	Endrin Aldehyde			0.1	0.1	U	
	alpha-Chlordane			0.05	0.05	U	
	gamma-Chlordane			0.05	0.05	U	
	Toxaphene			0.14	5	U	
	Aroclor-1016			2	1	U	
	Aroclor-1221			2	2	U	
	Aroclor-1232			2	1	U	
	Aroclor-1242			2	1	U	
	Aroclor-1248			2	1	U	
	Aroclor-1254			2	1	U	
	Aroclor-1260			2	1	U	
	Herbicides by 8151						
	Dalapon			5	5	UJ	
	Dicamba			2	2	UJ	
	Dichloroprop			5	5	UJ	
	2,4-D			4	1	UJ	
	2,4,5-TP (Silvex)			0.5	0.5	UJ	
	2,4,5-T			0.5	0.5	UJ	
	2,4-DB			5	5	UJ	
	Dinoseb			0.5	0.5	UJ	

000010

Recra LabNet - Lionville Laboratory

Pesticide/PCBs by GC, CLP List

Report Date: 01/21/99 12:43

RFW Batch Number: 9901L860

Client: TNU-HANFORD B99-037

Work Order: 10985001001 Page: 1

Cust ID: B0TL69 001 B0TL69 001 MS B0TL69 001 MSD B0TL71 002 PBLKZY PBLKZY BS  
 RFW#: 001 001 MS 001 MSD 002 99LE0058-MB1 99LE0058-MB1  
 Matrix: WATER WATER WATER WATER WATER WATER WATER  
 D.F.: 1.00 1.00 1.00 1.00 1.00 1.00 1.00  
 Units: UG/L UG/L UG/L UG/L UG/L UG/L UG/L

Surrogate:	Decachlorobiphenyl	88 %	75 %	85 %	87 %	92 %	92 %	92 %
Tetrachloro-m-xylene	68 %	52 %	58 %	72 %	58 %	58 %	55 %	55 %
Alpha-BHC	0.050 U	0.10 U	0.10 U	0.050 U				
Beta-BHC	0.050 U	0.10 U	0.10 U	0.050 U				
Delta-BHC	0.050 U	0.10 U	0.10 U	0.050 U				
gamma-BHC (Lindane)	0.050 U	65 %	75 %	0.050 U	0.050 U	0.050 U	85 %	85 %
Heptachlor	0.050 U	60 %	80 %	0.050 U	0.050 U	0.050 U	85 %	85 %
Aldrin	0.050 U	55 %	70 %	0.050 U	0.050 U	0.050 U	70 %	70 %
Heptachlor epoxide	0.050 U	0.10 U	0.10 U	0.050 U				
Endosulfan I	0.050 U	0.10 U	0.10 U	0.050 U				
Dieldrin	0.10 U	74 %	84 %	0.10 U	0.10 U	0.10 U	92 %	92 %
4,4'-DDE	0.10 U	0.20 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin	0.10 U	90 %	104 %	0.10 U	0.10 U	0.10 U	118 %	118 %
Endosulfan II	0.10 U	0.20 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.20 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.20 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	74 %	86 %	0.10 U	0.10 U	0.10 U	98 %	98 %
Methoxychlor	0.50 U	1.0 U	1.0 U	0.50 U				
Endrin ketone	0.10 U	0.20 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Endrin aldehyde	0.10 U	0.20 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.050 U	0.10 U	0.10 U	0.050 U				
gamma-Chlordane	0.050 U	0.10 U	0.10 U	0.050 U				
Toxaphene	5.0 U	10 U	10 U	5.0 U				
Aroclor-1016	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0 U	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

000011

PKC  
3/18/99

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

17/12/99

Recra LabNet - Lionville Laboratory  
Herbicides, Special List

Report Date: 02/05/99 15:39  
Page: 1

RFW Batch Number: 9901L860

Client: TNU-HANFORD B99-037 Work Order: 10985001001

Cust ID: B0TL69 B0TL71 B0TL71 B0TL71 B0TL71 PBLKAD PBLKAD BS  
 RFW#: 001 002 002 MS 002 MSD 99LE0067-MB1 99LE0067-MB1  
 Matrix: WATER WATER WATER WATER WATER WATER  
 D.F.: 1.00 1.00 1.00 1.00 1.00 1.00  
 Units: ug/L ug/L ug/L ug/L ug/L ug/L

Surrogate:	DCAA	93	%	fl	90	%	fl	90	%	fl	69	%	fl	94	%	fl	90	%
Dalapon		5.0	U	fl	5.0	U	fl	96	%	fl	79	%	fl	5.0	U	fl	96	%
Dicamba		2.0	U	fl	2.0	U	fl	96	%	fl	75	%	fl	2.0	U	fl	97	%
Dichloroprop		5.0	U	fl	5.0	U	fl	95	%	fl	76	%	fl	5.0	U	fl	99	%
2,4-D		1.0	U	fl	1.0	U	fl	84	%	fl	64	%	fl	1.0	U	fl	97	%
2,4,5-TP (Silvex)		0.50	U	fl	0.50	U	fl	66	%	fl	49	%	fl	0.50	U	fl	67	%
2,4,5-T		0.50	U	fl	0.50	U	fl	112	%	fl	98	%	fl	0.50	U	fl	108	%
2,4-DB		5.0	U	fl	5.0	U	fl	84	%	fl	69	%	fl	5.0	U	fl	93	%
Dinoseb		0.50	U	fl	0.50	U	fl	65	%	fl	51	%	fl	0.50	U	fl	77	%

*good 2/11/99*

*PKR  
3/15/99*

000012

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 TPL Qc.

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**



FEB 1999  
RECEIVED  
Data  
Log In

Recra LabNet Philadelphia  
Analytical Report

Client: TNU-HANFORD B99-037  
RFW#: 9901L860  
SDG/SAF#: H0338/B99-037

W.O.#: 10985-001-001-9999-00  
Date Received: 01-14-99

PESTICIDE/PCB

The set of samples consisted of two (2) water samples collected on 01-12-99.

The samples and their associated QC samples were extracted on 01-18-99 and analyzed based on SW846, 3rd Edition on 01-21-99. The extraction procedure was based on method 3520 and the extracts were analyzed based on method 8081.

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 cooler temperatures have been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

  
J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory

02-03-99  
Date

petr:\group\data\pcb\01L-860.pes

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

000014





Recra LabNet Philadelphia  
Analytical Report

Client: TNU-HANFORD B99-037  
RFW#: 9901L860  
SDG/SAF#: H0338/B99-037

W.O.#: 10985-001-001-9999-00  
Date Received: 01-14-99

**HERBICIDE**

The set of samples consisted of two (2) water samples collected on 01-12-99. CC

The samples and their associated QC samples were extracted on 01-20-99 and analyzed based on SW846, 3rd Edition on 01-29-99. The extraction and analysis procedure was based on method 8151.

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

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for analysis have been met. The samples were extracted one day out of hold. 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. All surrogate recoveries were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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 13 pages.

000015

9. Retention time criteria were exceeded for some target compounds. Larger retention time windows were used to evaluate the associated data. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

for *J. Michael Taylor*  
J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory  
pcfr:\group\data\her01L-860.her

02-15-99  
Date



000016

*[Handwritten signature]*







**Appendix 5**  
**Data Validation Supporting Documentation**

000020

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT: ERDF Leachate Dist. A			DATA PACKAGE: H0338		
VALIDATOR: TLI		LAB: <del>QES</del> RLU		DATE: 3/4/99	
CASE:			SDG: H0338		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP3/90	<input type="checkbox"/> SW-846 8080	<input checked="" type="checkbox"/> SW-846 8081	<del>SW-846 8082</del>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	BOTL69	BOTL71	Water		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **N/A**  
 Is a case narrative present? . . . . . **Yes** No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . **Yes** No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable . . . . . Yes No **N/A**  
 Are calibration standard retention times acceptable? . . . . . Yes No **N/A**  
 Are DDT and endrin breakdowns acceptable? . . . . . Yes No **N/A**

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? . . . . . Yes No  
Is the GC/MS tuning/performance check acceptable? . . . . . Yes No

N/A  
N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? . . . . . Yes No  
Are quantitation column calibration factor %RSD values acceptable? . . . . . Yes No  
Were the analytical sequence requirements met? . . . . . Yes No  
Are continuing calibration %D values acceptable? . . . . . Yes No

N/A  
N/A  
N/A  
N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? . . . . . Yes No  
Was the resolution acceptable in the resolution check mix? . . Yes No  
Is resolution acceptable in the PEM, INDA and INDB? . . . . . Yes No  
Are DDT and Endrin breakdowns acceptable? . . . . . Yes No  
Are retention times in PEMs and calibration mixes acceptable? . Yes No  
Are RPD values in the PEMs acceptable? . . . . . Yes No  
Are %RSD values acceptable? . . . . . Yes No

N/A  
N/A  
N/A  
N/A  
N/A  
N/A  
N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? . . . . . Yes No  
Is resolution acceptable in the PEMs? . . . . . Yes No  
Are initial calibrations acceptable? . . . . . Yes No

N/A  
N/A  
N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the  
PEMs, INDA and INDB mixes? . . . . . Yes No N/A

Are RPD values in the PEMs acceptable? . . . . . Yes No N/A

Are the DDT and endrin breakdowns acceptable? . . . . . Yes No N/A

Was GPC cleanup performed? . . . . . Yes No N/A

Is the GPC calibration check acceptable? . . . . . Yes No N/A

Was Florisil cleanup performed? . . . . . Yes No N/A

Is the Florisil performance check acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS results acceptable? . . . . . Yes No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

A-7

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

- Are MS/MSD RPD values acceptable? . . . . . Yes  No  N/A
- Are laboratory duplicate results acceptable? . . . . . Yes  No  N/A
- Are field duplicate RPD values acceptable? . . . . . Yes  No  N/A
- Are field split RPD values acceptable? . . . . . Yes  No  N/A

Comments: Heptachlor 24% Aldrin 24%  
No qual required - all undetect

7. SYSTEM PERFORMANCE

- Is chromatographic performance acceptable? . . . . . Yes  No  N/A
- Are positive results resolved acceptably? . . . . . Yes  No  N/A

Comments: \_\_\_\_\_

8. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? . . . . . Yes  No  N/A
- Is compound quantitation acceptable? . . . . . Yes  No  N/A

Comments: \_\_\_\_\_

9. REPORTED RESULTS AND QUANTITATION LIMITS

- Are results reported for all requested analyses? . . . . .  Yes  No  N/A
- Are all results supported in the raw data? . . . . . Yes  No  N/A
- Do results meet the CRQLs? . . . . . Yes  No  N/A

Comments: 10 over A+B -BHC heptachlor  
aldin Dieldrin toxaphene 44 dde 44 ddd 44 ddt



GENERAL GC DATA VALIDATION CHECKLIST

Comments: MS-MSD used lab criteria  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. PRECISION

- Are MS/MSD sample RPD values acceptable? . . . . .  Yes No  N/A
- Are field duplicate RPD values acceptable? . . . . . Yes No  N/A
- Are field split RPD values acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. COMPOUND IDENTIFICATION AND QUANTITATION

- Is compound identification acceptable? . . . . . Yes No  N/A
- Is compound quantitation acceptable? . . . . . Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? . . . . .  Yes No  N/A
- Are all results supported in the raw data? . . . . . Yes No  N/A
- Do results meet the CRQLs? . . . . .  Yes No  N/A

Comments: only 1 has a PQL  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





**Validation of Data Package H0338 – Review Comments – RL Weiss**

1. "PCB" Section – Section should identify that PCB, pesticide, and herbicide analyses were validated. Note 1 should include pesticides.
2. Inorganic Section – Page 12, Zn needs "U" flag applied as identified in the narrative.
3. Semivolatile Section – Page 12, Flag on Di-n-butylphthalate should be "J" not "U". Pages 16-19, need "J" flags applied as identified in the narrative.
4. Volatile Section – Pages 15 & 16, need "J" flags applied as identified in the narrative.

# Review Comment Record (RCR)

<b>1. Date</b> 3/29/99	<b>2. Review No.</b> BHI/QA99005
<b>3. Project</b> ERDF Leachate	<b>4. Page</b> Page 1 of 2

<b>5. Document Number(s)/Title(s)</b>  W0338 -RLN (SDG No. W0338)	<b>6. Program/Project/ Building Number</b> ERDF Leachate Delisting Analysis	<b>7. Reviewer</b> Claude Stacey	<b>8. Organization/Group</b> BHI/QA	<b>9. Location/Phone</b> H0-16/372-9208
---	---	-------------------------------------	--	--

**17. Comment Submittal Approval:** \_\_\_\_\_ **11. CLOSED**

Agreement with indicated comment disposition(s)

Organization Manager (Optional) \_\_\_\_\_ Reviewer/Point of Contact \_\_\_\_\_  
 Date \_\_\_\_\_ Date \_\_\_\_\_

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Volatiles: In the Subject and on page 005, Completeness, page 025, refer to this being a QES data package, where it is a Recra LabNet (RLN) package.			
2	SemiVolatiles: OK No Comments			
3	Inorganics: Page 1, the note for the table indicates the mercury was run by method 7471. Method 7471 is for soils and expect this should be 7470, waters.			
4	PCB, Pesticides, and Herbicides: The Subject should specify the summary report also contains Pesticides and Herbicides, not just PCB.			
5	PCB: Page 1, the note for the table needs to indicate pesticides were also determined by 8081.			
6	PCB: Page 003 under Analytical Detection Limits, the last sentence "The following analytes had PQLs/CRDLs above the laboratory reported detection limits:" should read "The following analytes had laboratory reported detection limits above the PQLs/CRDLs." Also Gamma-BHC (Lindane) and Heptachlor Epoxide should be added to the list.			
7	PCBs: The note on page 1 and the narrative from the laboratory indicates the PCBs were run by 8081; whereas, the referenced document DOE/RL 98-47 Draft B calls for the PCBs to be run by 8082. It should be indicated in the summary report that a different method was used for PCBs then what was called for.			
8	PCBs: page 021 and 025 under lab has QES, this should be RLN.			

# Review Comment Record (RCR)

	1. Date 3/29/99	2. Review No. BHI/QA99005
	3. Project ERDF Leachate	4. Page Page 2 of 2

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
9	Wet Chemistry: Page 1 under Subject indicates data package is a QES data package; whereas, it should indicate RL.N.			
10	Wet Chemistry: Analytical Detection Limits, it is indicated that the reported detection limit for ammonia was above the PQL/CRDL; however, the reported detection limit for cyanide was exceeded not ammonia.			
11	Wet Chemistry: Page 004 under Completeness has the Data Package No. as H0338-QES. This should be H0338-RLN.			
12	Wet Chemistry: Page 010, the top0 of the table indicates all the information in the table is reported as MG/L; whereas, the laboratory reported data is in mg/l with the exception of cyanide and the CRDL are in ug/l. As indicated above, the laboratory reported value for Cyanide is in ug/L not mg/l as indicated in the table.			

# Review Comment Record (RCR)

1. Date 3/29/99	2. Review No. BHI/QA99005
3. Project ERDF Leachate	4. Page Page 1 of 2

5. Document Number(s)/Title(s) W0338 -RLN (SDG No. W0338)	6. Program/Project/ Building Number ERDF Leachate Delisting Analysis	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone HC-16/372-9208
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10. Agreement with indicated comment disposition(s)  
11. CLOSED

17. Comment Submittal Approval:  
 Organization Manager (Optional) \_\_\_\_\_ Date \_\_\_\_\_  
 Reviewer/Point of Contact \_\_\_\_\_ Date 5 Apr. 99  
 Reviewer/Point of Contact \_\_\_\_\_  
 Author/Originator \_\_\_\_\_

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1/1	Volatiles: In the Subject and on page 005, Completeness, page 025, refer to this being a QES data package, where it is a Recra LabNet (RLN) package.		correct per	
2	SemiVolatiles: OK No Comments		per	
3	Inorganics: Page 1, the note for the table indicates the mercury was run by method 7471. Method 7471 is for soils and expect this should be 7470, waters.		correct per	
4	PCB, Pesticides, and Herbicides: The Subject should specify the summary report also contains Pesticides and Herbicides, not just PCB.		correct per	
5	PCB: Page 1, the note for the table needs to indicate pesticides were also determined by 8081.		correct per	
6	PCB: Page 003 under Analytical Detection Limits, the last sentence "The following analytes had PQLs/CRDLs above the laboratory reported detection limits;" should read "The following analytes had laboratory reported detection limits above the PQLs/CRDLs." Also Gamma-BHC (Lindane) and Heptachlor Epoxide should be added to the list.		correct per	
7	PCBs: The note on page 1 and the narrative from the laboratory indicates the PCBs were run by 8081; whereas, the referenced document DOE/RL 98-47 Draft B calls for the PCBs to be run by 8082. It should be indicated in the summary report that a different method was used for PCBs then what was called for.		cannot per	
8	PCBs: page 021 and 025 under lab has QES, this should be RLN.		cannot per	

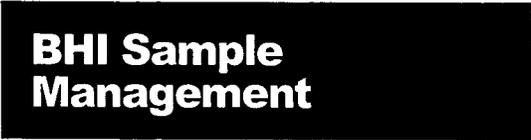
Date: 5 Apr 99 # of pages: 1

To: Charlotte, Durham  
 From: R. Stacey  
 Co/Dept: i Data Management  
 Phone #: 375-9439  
 Fax #: 372-9487

Post-it® Fax Note 7671



Bechtel Hanford, Inc.  
3350 George Washington Way  
Richland, WA 99352



Attn: BHI Sample Management  
3190 George Washington Way  
MSIN: H9-03  
Phone: 375-9439  
FAX: 372-9487

# Fax

To: Claude Stacey      From: Jeanette Duncan  
Fax: 372-9447      Pages: 24  
Phone:      Date: 4/5/99  
Re:      CC:

Urgent     For Review     Please Comment     Please Reply     Please Recycle

• Comments:  
Validator comment disposition for  
H0338 (ERDF Delisting)

# Review Comment Record (RCR)

1. Date 3/29/99	2. Review No. BHI/QA99005
3. Project ERDF Leachate	4. Page Page 1 of 2

5. Document Number(s)/Title(s) W0338 -RLN (SDG No. W0338)	6. Program/Project/ Building Number ERDF Leachate Delisting Analysis	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
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17. Comment Submittal Approval: \_\_\_\_\_ 11. CLOSED

Organization Manager (Optional) _____	Reviewer/Point of Contact _____	Date _____
Author/Originator _____	Author/Originator _____	Author/Originator _____

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Volatiles: In the Subject and on page 005, Completeness, page 025, refer to this being a QES data package, where it is a Recra LabNet (RLN) package.		corrected <i>ps</i>	
2	SemiVolatiles: OK No Comments		<i>ps</i>	
3	Inorganics: Page 1, the note for the table indicates the mercury was run by method 7471. Method 7471 is for soils and expect this should be 7470, waters.		corrected <i>ps</i>	
4	PCB, Pesticides, and Herbicides: The Subject should specify the summary report also contains Pesticides and Herbicides, not just PCB.		correct <i>ps</i>	
5	PCB: Page 1, the note for the table needs to indicate pesticides were also determined by 8081.		corrected <i>ps</i>	
6	PCB: Page 003 under Analytical Detection Limits, the last sentence "The following analytes had PQLs/CRDLs above the laboratory reported detection limits" should read "The following analytes had laboratory reported detection limits above the PQLs/CRDLs." Also Gamma-BHC (Lindane) and Heptachlor Epoxide should be added to the list.		correct <i>ps</i>	
7	PCBs: The note on page 1 and the narrative from the laboratory indicates the PCBs were run by 8081; whereas, the referenced document DOE/RL 98-47 Draft B calls for the PCBs to be run by 8082. It should be indicated in the summary report that a different method was used for PCBs then what was called for.		correct <i>ps</i>	
8	PCBs: page 021 and 025 under lab has QES, this should be RLN.		correct <i>ps</i>	

# Review Comment Record (RCR)

	1. Date 3/29/99	2. Review No. BHI/QA99005
	3. Project ERDF Leachate	4. Page Page 2 of 2

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
9	Wet Chemistry: Page 1 under Subject indicates data package is a QES data package; whereas, it should indicate RLN.		correct <i>ks</i>	
10	Wet Chemistry: Analytical Detection Limits, it is indicated that the reported detection limit for ammonia was above the PQL/CRDL; however, the reported detection limit for cyanide was exceeded not ammonia.		correct <i>ks</i>	
11	Wet Chemistry: Page 004 under Completeness has the Data Package No. as H0338-QES. This should be H0338-RLN.		correct <i>ks</i>	
12	Wet Chemistry: Page 010, the top0 of the table indicates all the information in the table is reported as MG/L; whereas, the laboratory reported data is in mg/l with the exception of cyanide and the CRDL are in ug/l. As indicated above, the laboratory reported value for Cyanide is in ug/L not mg/l as indicated in the table.		correct <i>ks</i>	

Validation of Data Package H0338 – Review Comments – RL Weiss

SK  
RLW  
RL

1. "PCB" Section – Section should identify that PCB, pesticide, and herbicide analyses were validated. Note 1 should include pesticides. RL
2. Inorganic Section – Page 12, Zn needs "U" flag applied as identified in the narrative. \*
3. Semivolatile Section – Page 12, Flag on Di-n-butylphthalate should be "J" not "U". Pages 16-19, need "J" flags applied as identified in the narrative. RL
4. Volatile Section – Pages 15 & 16, need "J" flags applied as identified in the narrative. RL

\* the zinc was only "U" for BOTL69, which is ps 11.

Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: Wet Chemistry - Data Package No. H0338-RLN (SDG No. H0338)

## **INTRODUCTION**

This memo presents the results of data validation on Summary Data Package No. H0338-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOTL69	01/12/99	Water	C	See note 1 & 2
BOTL71	01/12/99	Water	C	See note 1 & 2

1 - IC Anions - 9056 (bromide, fluoride, nitrate, nitrite, sulfate); ammonia - 350.3; cyanide - 9010B; total organic carbon (TOC) - 9060; total dissolved solids (TDS) - 160.1; total suspended solids (TSS) - 160.2; specific conductance - 9050A, pH - 9040; sulphide - 9030; oil & grease - 9070.

2 - Phosphate by 9056 was requested but phosphate by 365.2 was reported.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 28 days for ammonia, phosphate, specific conductance, TOC, oil & grease, and IC anions (bromide, chloride, fluoride, and sulfate); 14 days for

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cyanide; 7 days for sulfide, TSS and TDS; 2 days for IC anion (nitrate and nitrite); and immediate for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Due to the holding time being exceeded by greater than two times the limit, all pH results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by greater than two times the limit, all nitrate results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than two times the limit, all TDS results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by less than two times the limit, all TSS results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by greater than two times the limit, all nitrite results were qualified as rejected and flagged "UR".

Due to the oil and grease sampling being preserved with  $H_2SO_4$  instead of HCL (as required by the method), all oil and grease results were qualified as estimates and flagged "J".

Holding times were met for all other parameters and samples.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the CRQL to be acceptable.

All method blank results were acceptable.

- **Accuracy**

- Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 30% and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

- Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 35% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the PQL/CRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the PQL/CRQL and the sample concentration is less than five times the PQL/CRQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the PQL/CRQL or plus or minus the PQL/CRQL for positive sample results less than five times the PQL/CRQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate precision results were within the required control limits.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Environmental Restoration Disposal Facility Leachate Delisting Petition PQLs or the CRDL if no PQL was specified, to ensure that laboratory detection levels meet the required criteria. The reported detection limit for cyanide was above PQL/CRDL. All other reported laboratory detection levels met the analyte specific PQL/CRDL.

- **Completeness**

Data Package No. H0338-RLN (SDG No. H0338) was submitted for validation and verified for completeness. The completion rate was 93%.

### **MAJOR DEFICIENCIES**

Due to the holding time being exceeded by greater than two times the limit, all nitrite results were qualified as rejected and flagged "UR". Rejected data is unusable and should not be reported.

### **MINOR DEFICIENCIES**

Due to the holding time being exceeded by greater than two times the limit, all pH results were qualified as estimates and flagged "J". Due to the holding time being exceeded by greater than two times the limit, all nitrate results were qualified as estimates and flagged "J". Due to the holding time being exceeded by less than two times the limit, all TDS results were qualified as estimates and flagged "J". Due to the holding time being exceeded by less than two times the limit, all TSS results were qualified as estimates and flagged "J". Due to the oil and grease sampling being preserved with H<sub>2</sub>SO<sub>4</sub> instead of HCL (as required by the method), all oil and grease results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

Project: BECHTEL-HANFORD  
 Laboratory: Rebra LabNet

Case: SDG: H0338

Sample Number	B0TL69		B0TL71	
	ERDF	ERDF	ERDF	ERDF
Remarks				
Sample Date	1/12/99	1/12/99		
General Chemistry	CRDL	Q	Result	Q
Bromide	0.25	2.8	2.8	
Fluoride	0.05	1.4	1.5	
Nitrite	0.05	5 UR	5 UR	
Nitrate	0.05	130 J	120 J	
Cyanide***	3.1	5 U	10 U	
Sulfate	0.25	324	338	
Ammonia	0.03	0.1 U	0.1 U	
TOC	0.53	12.2	12.3	
Oil & Grease	0.5	1.1 UJ	1.1 UJ	
pH*	0.1	7.9 J	8 J	
Phosphate	0.25	0.12	0.12	
Sulfide		1 U	1 U	
Specific Conductance**	0.15	1870	2100	
TDS	4.7	1800 J	1600 J	
TSS	1	5 UJ	5 UJ	

\* Units are pH units  
 \*\* Units are UMHOS/CM  
 \*\*\* Units are ug/l

000010

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT: ERDF Delisting			DATA PACKAGE: W0338		
VALIDATOR: JLI		LAB: <i>QES</i>		DATE: 3/4/99	
CASE:			SDG: W0336		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Anions/IC	<input checked="" type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	<input checked="" type="checkbox"/> Oil and Grease	Alkalinity
<input checked="" type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input checked="" type="checkbox"/> pH	<input type="checkbox"/> NO <sub>3</sub> /NO <sub>2</sub>
<input type="checkbox"/> Sulfate	<input checked="" type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input checked="" type="checkbox"/> Phosphate	<input checked="" type="checkbox"/> Cyanide	<input checked="" type="checkbox"/> Sulphide
<input checked="" type="checkbox"/> TSS	<input checked="" type="checkbox"/> SC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX <i>BOTTLE BOTTLE water</i>					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **(N/A)**

Is a case narrative present? . . . . . **(Yes)** No N/A

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes **(No)** N/A

Comments: *Nitrate, Nitrite + ph J/UR*

*TDS, TSS J/UR*

*— used H<sub>2</sub>SO<sub>4</sub> in oil + grease instead of HCL 'J'*

*Ammonia Method? 345.2*

*A-23*

Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: PCBs, Pesticides and Herbicides - Data Package No. H0338-RLN (SDG No. H0338)

## INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0338-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOTL69	1/12/99	Water	C	See note 1 & 2
BOTL71	1/12/99	Water	C	See note 1 & 2

1 - Pesticides/PCBs by 8081 and herbicides by 8151.

2 - PCBs were not analysed by EPA method 8082 (as stated in the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B) but by an equivalent method (EPA 8081)

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Water samples must be extracted within 7 days of the date of sample

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collection and analyzed within 40 days from the date of extraction (extraction holding time applies to 8081 only).

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all nondetects are rejected and flagged "UR".

Due to the holding time being exceeded by less than two times the limit, all herbicide (8151) results were qualified as estimates and flagged "J".

All other holding times were met.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

- **Accuracy**

- Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be within control limits of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike results were acceptable.

000002

### Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

#### Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. The RPD for liquid samples is  $\leq 20\%$  and  $\leq 35\%$  for soils. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Environmental Restoration Disposal Facility Leachate Delisting Petition PQLs or the CRDL if no PQL was specified, to ensure that laboratory detection levels meet the required criteria. The following analytes had laboratory reported detection limits above the analyte specific PQLs/CRDLs:

alpha-BHC	beta-BHC	heptachlor
aldrin	toxaphene	dieldrin
4,4'-DDE	endrin	4,4'-DDD
4,4'-DDT	gamma-BHC (lindane)	heptachlor epoxide

Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL or CRDL.

---

- **Completeness**

Data Package No. H0338-RLN (SDG No. H0338) was submitted for validation and verified for completeness. The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### **MINOR DEFICIENCIES**

Due to the holding time being exceeded by less than two times the limit, all herbicide (8151) results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

#### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.



PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT: ERDF Leachate Delisting A			DATA PACKAGE: H0338		
VALIDATOR: TLI		LAB: QES? RLU		DATE: 3/4/99	
CASE:			SDG: H0338		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP3/90	<input type="checkbox"/> SW-846 8080	<input checked="" type="checkbox"/> SW-846 8081	<del>SW-846 8081</del>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	BOTL69	BOTL71	Water		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **N/A**  
 Is a case narrative present? . . . . . **Yes** No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . **Yes** No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable . . . . . Yes No **N/A**  
 Are calibration standard retention times acceptable? . . . . . Yes No **N/A**  
 Are DDT and endrin breakdowns acceptable? . . . . . Yes No **N/A**

Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: Inorganics - Data Package No. H0338-RLN (SDG No. H0338)

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. H0338-RLN prepared by Reca LabNet (RLN). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOTL69	1/12/99	Water	C	See note 1
BOTL71	1/12/99	Water	C	See note 1

1- ICP metals by 6010B; mercury by 7470A.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

Analytical holding times for chromium mercury and ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within six (6) months for ICP metals; and 28 days for mercury.

All holding times were acceptable.

000001





Date: 22 March 1999  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: ERDF Leachate Delisting Analysis  
Subject: Volatiles - Data Package No. H0338-RLN (SDG No. H0338)

## **INTRODUCTION**

This memo presents the results of data validation on Summary Data Package No. H0338-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
BOTL69	01/12/99	Water	C	See note 1, 2 & 3
BOTL71	01/12/99	Water	C	See note 1, 2, & 3
BOTL73	01/12/99	Water	C	See note 1

- 1 - Volatiles by EPA 8260A (with add-ons).
- 2 - Alcohols (butanol and methanol) by 8015B and formaldehyde by 8315.
- 3 - Diethyl ether by 8015B was requested but not reported.

Data validation was conducted in accordance with the BHI validation statement of work and the Environmental Restoration Disposal Facility Leachate Delisting Petition (DOE/RL-98-47 Draft B). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

## **DATA QUALITY OBJECTIVES**

- **Holding Times**

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within 14 days of the date of sample collection for VOA and alcohols. Samples must be derivitized within 3 days and analyzed within 3 days for

000001

- **Completeness**

Data package No. H0338-RLN (SDG No. H0338) was submitted for validation and verified for completeness. The completion percentage was 100%.

### **MAJOR DEFICIENCIES**

None found.

### **MINOR DEFICIENCIES**

Due to the lack of a surrogate analysis, all butanol (8015B) and methanol results were qualified as estimates and flagged "J". Due to the lack of a matrix spike/matrix spike duplicate analysis, all formaldehyde results were qualified as estimates and flagged "J". Due to the holding time being exceeded by less than twice the limit, all formaldehyde results were qualified as estimates and flagged "J". Due to laboratory blank contamination, the methylene chloride results in samples BOTL69 and BOTL71 were raised to the CRQL, qualified as undetected and flagged "U". Under the BHI statement of work, no qualification is required. Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-98-47, Draft B, *Environmental Restoration Disposal Facility Leachate Delisting Petition*, U.S. Department of Energy, October 1998.

Cust ID:	B0TL69	B0TL69	B0TL69	B0TL71	BLK	BLK BS
RFW#:	001	001 MS	001 MSD	002	99LLC005-MB1	99LLC005-MB1
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

Methanol	6.5 U J	103 %	105 %	6.5 U J	6.5 U	102 %
Butanol	5.6 U J	99 %	102 %	5.6 U J	5.6 U	99 %

*Handwritten signature*

000015

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

*Handwritten signature*  
3/19/99

Recra LabNet - Lionville Laboratory

HPLC scan

RFW Batch Number: 9901L860

Client: TNU-HANFORD B99-037

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

Report Date: 01/20/99 12:33

Page: 1

Cust ID: B0TL69 B0TL71 BLK BS BLK BSD  
 RFW#: 001 002 99LLC004-MB1 99LLC004-MB1 99LLC004-MB1  
 Matrix: WATER WATER WATER WATER  
 D.F.: 1.00 1.00 1.00 1.00  
 Units: ug/L ug/L ug/L ug/L

=====  
 Formaldehyde 12 U J 12 U J 12 U 111 % 111 %  
 =====fl=====fl=====fl=====fl=====fl

*01/28/99*

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

*JW*  
 3/19/99

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT: ERDF Delist			DATA PACKAGE: H0338		
VALIDATOR: TLI		LAB: QES RLN		DATE: 3/4/99	
CASE:			SDG: H0338		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP Volatiles	<input type="checkbox"/> SW-846 8240 (cap column)	<input checked="" type="checkbox"/> SW-846 8260 (packed column)	<input type="checkbox"/> CLP Semivolatiles	<input type="checkbox"/> SW-846 8270 (cap column)	<input type="checkbox"/> SW-846 (packed column)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX BOTL6? BOTL71 BOTL73 water					
(FB)					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No **N/A**  
 Is a case narrative present? . . . . . **Yes** No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . **Yes** No N/A

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
050	MEMORY TX		3729447	24/24	OK

ERRORS

- 1) HANG UP OR LINE FAIL
- 2) BUSY
- 3) NO ANSWER
- 4) NO FACSIMILE CONNECTION

Bechtel Hanford, Inc.  
 3350 George Washington Way  
 Richland, WA 99352

Attn: BHI Sample Management  
 3190 George Washington Way  
 MSIN: H9-03  
 Phone: 375-9439  
 FAX: 372-9487



# Fax

To: Claude Stacey From: Jeanette Duncan  
 Fax: 372-9447 Pages: 24  
 Phone: \_\_\_\_\_ Date: 4/5/99  
 Re: \_\_\_\_\_ CC: \_\_\_\_\_

Urgent  For Review  Please Comment  Please Reply  Please Recycle

**FAX**

**TECHLAW, INC.**

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 4 March 1999

Information Request

W0338 - Inorganics

Hand changes on page 10 - The lab changed the RPD to exactly 200% for four analytes, each of which was undetected for either the original sample or the duplicate. I need to see the actual number (instead of ND) so I can calculate them myself since the 200% ~~don't~~ *doesn't* seem to add up.

# **FAX**

## **TECHLAW, INC.**

**451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)**

**To: Jeanette Duncan**

**From: Bruce Christian**

**Pages: 1**

**Date: 4 March 1999**

**Information Request**

**H0338 - SV**

**I need the spike concentration used in the matrix spike/matrix spike duplicate.**

# FAX

## TECHLAW, INC.

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 18 March 1999

Information Request

H0338 - PCBs

ERDF delisting petition, page 3-19, states that the PQL for PCBs varies depending on the specific aroclor (0.5 - 9.0). I need to have a list of specific aroclors and their associated PQL so I can review them against the lab data.

p.s. My fax is out so call me.

*Per Rich Weiss, use 2 as the RDL*

# **FAX**

## **TECHLAW, INC.**

**451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)**

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 4 March 1999

Information Request

H0338 - Chain of Custody

I need a darker/clearer copy of the chain of custody. I will be happy to pick it up since a fax will degrade the clarity.

# FAX

## TECHLAW, INC.

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 4 March 1999

Information Request

H0338 - Ammonia

I need to know the distillation method used for ammonia.

# FAX

## TECHLAW, INC.

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

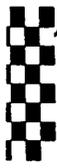
Pages: 1

Date: 4 March 1999

Information Request

H0338 - SV

I need the spike concentration used in the matrix spike/matrix spike duplicate.



# FAX

## TECHLAW, INC.

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 4 March 1999

Information Request

H0338 - Ammonia

I need to know the distillation method used for ammonia.

*Method used is EPA 350.3, no distillation required.  
Direct measurement using a selective ion electrode*

# FAX

## TECHLAW, INC.

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 4 March 1999

Information Request

W0338 - Inorganics

Hand changes on page 10 - The lab changed the RPD to exactly 200% for four analytes, each of which was undetected for either the original sample or the duplicate. I need to see the actual number (instead of ND) so I can calculate them myself since the 200% ~~don't~~ <sup>doesn't</sup> seem to add up.

*RPD of 200% is wrong for these. Lab should have reported 'NC' (not calculatable). You shouldn't need to calc an RPD when one or both are ND. Call me if you have a question*

*Rach*

**FAX**

**TECHLAW, INC.**

**451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)**

**To: Jeanette Duncan**

**From: Bruce Christian**

**Pages: 1**

**Date: 4 March 1999**

**Information Request**

**H0338 - General Chemistry**

The ERDF Delisting petition calls for method 9056 for phosphate as does the chain of custody. The lab has phosphate listed as total phosphate, not IC phosphate. Please ask them the specific method they used for analysis.

*EPA 365.2*

**FAX**

**TECHLAW, INC.**

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 5 March 1999

Information Request

H0338 - All analytes

The ERDF Delisting Petition gives PQL/EQLs for a number of analytes. Are these to be used in place of CRDLs?

*Yes*

# FAX

## TECHLAW, INC.

451 Hills, Suite 23  
Richland, WA 99352  
509-375-5667  
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 4 March 1999

Information Request

H0338 - Chain of Custody

I need a darker/clearer copy of the chain of custody. I will be happy to pick it up since a fax will degrade the clarity.

## CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

**Collector:** Doug Bowers/Renee Neilson **Telephone No.:** 372-9086 **Project Coordinator:** WEISS, RL

**Project Designation:** ERDF Leachate Delisting Analysis **Company Contact:** Fred Roeck **Price Code:** B99-037-01 **Data Turnaround:** 45 Days

**Ice Chest No.:** **Field Logbook No.:** EFL-1133-7 **Method of Shipment:** Fed Ex

**Shipped To:** TMA/RECRA **Offsite Property No.:** **Bill of Lading/Air Bill No.:**

**COA**

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		None	None	HCl or H2SO4 to pH <2 Cool	Cool 4C	HNO3 to pH <2	Cool 4C	Cool 4C	Cool 4C	Cool 4C
				Type of Container	No. of Container(s)									
B0TL69	Water			P	1	125mL	20mL	aG	500mL	G	500mL	P	P	P
B0TL71	Water			P	1	125mL	20mL	aG	500mL	G	500mL	P	P	P
B0TL73	Water			P	1	125mL	20mL	aG	500mL	G	500mL	P	P	P

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	pH (Water) - 9040	TOC - 9060	Carbonyls - 8315 (Formaldehyde)	NonVDA by EXT/TS/MS (Bendiocarb)	Mercury - 7470 - (CV)	Conductivity - 9050	See item (1) in Special Instructions.	Cool 4C	Cool 4C	Cool 4C

**SPECIAL INSTRUCTIONS**

\*\* Close SDG upon receipt of samples.

(1) IC Anions - 9056 (Bromide, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method		

## CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

**Collector:** Doug Bowers/Renee Neilson  
**Project Designation:** ERDF Leachate Delisting Analysis  
**Ice Chest No.:**  
**Shipped To:** TMA/RECRA

**Company Contact:** Fred Roeck  
**Telephone No.:** 372-9086  
**Project Coordinator:** WEISS, RL  
**SAF No.:** B99-037  
**Method of Shipment:** Fed Ex  
**Bill of Lading/Air Bill No.:**  
**COA**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	Zn+Ac+NaOH to pH >9 Cool	NaOH to pH >= 12 Cool 4C	H2SO4 to pH <2 Cool 4C				
				Type of Container	No. of Container(s)									
B0TL69	Water			P	1	500mL	P	1	1	aG	2	2	aG	1000mL
B0TL71	Water			P	1	500mL	P	1	1	aG	2	2	aG	1000mL
B0TL73	Water			P	1	500mL	P	1	1	aG	2	2	aG	1000mL

**POSSIBLE SAMPLE HAZARDS/REMARKS**

**Special Handling and/or Storage**  
cool to 4C

**SPECIAL INSTRUCTIONS**  
 \*\* Close SDG upon receipt of samples.  
 (1) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Silicon, Thallium, Tin)  
 (2) 8310\_SVOA\_HPLC (Benz(a)anthracene, Benz(b)fluoranthene, Dibenz(a,h)anthracene)  
 (3) Nitrosamines - 8070 (N-Nitroso-di-n-dipropylamine, N-Nitrosodimethylamine)  
 (4) Semi-VOA - 8270A (App IX); Semi-VOA - 8270A (App IX Add-On) (1,2-Diphenylhydrazine, 1,4-Dinitrobenzene, 1-Acetyl-2-thiourea, 2,5-Diaminotoluene, 2-Cyclohexyl-4,6-dinitrophenol)

**Matrix \***  
 Soil  
 Water  
 Vapor  
 Other Solid  
 Other Liquid

**CHAIN OF POSSESSION**

Received By	Date/Time						

**LABORATORY SECTION** Received By \_\_\_\_\_ Title \_\_\_\_\_ Date/Time \_\_\_\_\_

**FINAL SAMPLE DISPOSITION** Disposed By \_\_\_\_\_ Date/Time \_\_\_\_\_

## CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

<b>Collector</b> Doug Bowers/Renee Neilson	<b>Company Contact</b> Fred Roock	<b>Telephone No.</b> 372-9086	<b>B99-037-01</b>
<b>Project Designation</b> ERDF Leachate Delisting Analysis	<b>Sampling Location</b> ERDF (200 west)	<b>Project Coordinator</b> WEISS, RL	<b>Price Code</b>
<b>Ice Chest No.</b>	<b>Field Logbook No.</b> EFL-1133-7	<b>SAF No.</b> B99-037	<b>Data Turnaround</b> <b>45 Days</b>
<b>Shipped To</b> TMA/RECRA	<b>Offsite Property No.</b>	<b>Method of Shipment</b> Fed Ex	
<b>Bill of Lading/Air Bill No.</b>			
<b>COA</b>			

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		See item (1) in Special Instructions	See item (2) in Special Instructions
				Type of Container	No. of Container(s)		
B0TL69	Water			Cool 4C	3	aGs*	HCl Cool 4C
B0TL71	Water				3		aGs*
B0TL73	Water						40mL

**SAMPLE ANALYSIS**

**POSSIBLE SAMPLE HAZARDS/REMARKS**

**Special Handling and/or Storage**  
cool to 4C

**CHAIN OF POSSESSION**

Sign/Print Names		Date/Time
Received By		Date/Time

**SPECIAL INSTRUCTIONS**  
\*\* Close SDG upon receipt of samples.

(1) Alcohols, Glycols, & Ketones - 8015M (1-Butanol, Diethyl ether, Methanol)  
 (2) VOA - 8260A (App IX); VOA - 8260A (App IX Add-On) (1,1,2-Trichloro-1,2,2-trifluoroethane, 1,3-Butadiene, 1-Butanol, 2-Chloroethyl vinyl ether, Allyl alcohol, cis-1,2-Dichloroethylene, Crotonaldehyde, Dichloropropanol, Diethyl ether, Ethyl acetate, Isoprop

**Matrix \***  
Soil  
Water  
Vapor  
Other Solid  
Other Liquid

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