DRAFT LETTER REPORT REDWOOD DUMP DATA VALIDATION INORGANIC VALIDATION EPA CASE #16324

OCTOBER 18, 1991

Prepared For

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF RESPONSE AND REMEDIATION SALT LAKE CITY, UTAH

Prepared By

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INTRODUCTION

- This report summarizes the findings of Versar A & E, Inc., in the validation of Inorganic Analyses performed by EPA contracted laboratories. The validation process was completed by a Versar team following the Functional Guidelines used by the U.S. EPA Hazardous Site Evaluation Division.
- Approximately ten percent of the reported test data within the sample groups was examined to check for accuracy. The limits of this data validation did not include cation - anion balances or statistical evaluation as prescribed by EPA. This limited scope of work was performed as directed by the Utah Division of Environmental Response and Remediation (UDERR).
- Validation was performed on all samples within Case Number 16324. Included in this case were two Inorganic Sample Delivery Groups, SDG Number MHN 621 and MHN 632.

SAMPLES ANALYZED

- Inorganic Sample Delivery Group (SDG) Number MHN 621 and MHN 632 each contained 11 soil samples for full Inorganic validation. Samples included in the SDG included samples MHN 621 through MHN 642.
- All samples from both Sample Delivery Groups were tested by Datachem Laboratories, Inc., of Salt Lake City, Utah. Sample data for this case was delivered to Versar A & E through the Utah Division of Environmental Response and Remediation (UDERR).

STATEMENT OF WORK, FUNCTIONAL GUIDELINES

The testing laboratory followed the protocol in the U.S. EPA Statement of Work (SOW) dated 7/88 during the Inorganic testing. The validation team used the same SOW during the validation, and no problems were encountered. One item of interest with EPA Functional Guidelines was that the U.S. EPA Functional Guidelines for Evaluating Inorganics Analyses used by the validation team was dated 2/88 and was based on the 10/86 Low/Mod concentration SOW. Limits and criteria found in these guidelines were checked against corresponding limits and criteria in the 3/90 SOW to ensure proper validation of EPA limits and criteria. Any differences between the 2/88 Functional Guidelines and 7/88 SOW were corrected according to the 7/88 SOW criteria.

EVALUATION CRITERIA

The evaluation of data was based on compliance of data with criteria given in the 7/88 SOW for the categories on the following page.

- Inorganic Analysis Criteria
- 1. Holding Times
- 2. Calibration
- 3. Blank Analyses
- 4. ICP Interference Check
- Sample Results
- 5. Lab Control Sample Results
- 6. Duplicate Sample Results
- 7. Matrix Spike Sample Results
- 8. Furnace Atomic Absorption
- 9. ICP Serial Dilution Results
- 10. Sample Result Verification
- 11. Field Duplicates
- 12. Overall Assessment of Data

GENERAL CASE ASSESSMENT

In most cases, the data contained in the validation complied with the EPA Functional Guidelines or qualified due to only minor problems (See Attachment I for a complete listing of regional data assessments and Attachment III for sample compound qualifications). Although most of the data was rated as acceptable, several problems were discovered.

For SDG Number MHN 621, several problems were found. No EPA Traffic Report was included in the data packet. According to receipt dates contained within available data, the laboratory performed all tests within holding time limits. Therefore, no data was qualified. Several elements were found in the blank at concentrations close to the samples. Beryllium, Cadmium, and Selenium were each qualified in several samples (see Problems and Actions section of this report for a detailed list of samples qualified). Potassium was gualified as estimated (J) in all samples because of similar concentrations to that of the ICP All Mercury results were qualified as estimated (J) sample. because reported values fell outside Field Duplicate control The Matrix Spike Recoveries for Selenium, Antimony, limits. Mercury, and Arsenic were less than the required 75-125%. These elements were qualified as estimated (J) or estimated/undetected (UJ) depending on the sample concentrations. Selenium for samples MHN 626 and 628 was qualified as J or UJ because Spike Recovery Results were outside prescribed limits.

For SDG Number MHN 632, several problems similar to SDG MHN 621 were found. Beryllium was found in the blank at concentrations similar to samples MHN 635 and MHN 640. Therefore, Beryllium was qualified as undetected (U) in these samples. The Matrix Spike Recoveries for Selenium, Mercury, and Thallium were less than the required 75-125%. These elements were qualified as estimated (J) or estimated/undetected (UJ) in all samples. Lead, Selenium, and Thallium were outside Post-Digestion Spike recovery limits. Therefore, these elements were qualified for samples related to these spikes (see Problems and Actions section of this report for a detailed list of samples qualified). The Percent Difference (%D) between the sample and the Serial Dilution was above the limit for Barium in all samples. Therefore, Barium was qualified in all samples as estimated (J). No Traffic Report was included in the data packet, but it appeared that no Field Duplicates were a part of the testing.

PROBLEMS AND ACTIONS

SDG/MATRIX:	ANALYSIS:	SAMPLES VALIDATED:
MHN 621	INORGANIC	MHN 621-631

<u>Holding Times</u>: No EPA Traffic Report was included in the data packet. According to receipt dates contained within available data, the laboratory performed all tests with holding time limits. Therefore, no data was qualified because of a lack of information concerning sampling dates. Pages 251-264 and 266-270 were missing from the data packet.

<u>Blank Results</u>: Several elements were found in the blank at concentrations close to the samples. The following is a list of elements qualified because of blank contamination:

<u>Element</u>	<u>Samples Qualified</u>	<u>Qualification</u>
Ве	All Samples	U
Cd	All but 621	U
Se	MHN 627, 628	U

<u>ICP Interference Check Sample (ICS)</u>: Potassium was qualified as estimated (J) in all samples because of similar concentrations to that of the ICP sample.

<u>Duplicate Sample Results</u>: All Mercury results were qualified as estimated (J) because reported values fell outside Field Duplicate control limits.

<u>Matrix Spike and Matrix Spike Duplicate Results</u>: The Matrix Spike Recoveries for Selenium, Antimony, Mercury, and Arsenic were less than the required 75-125%. These elements were qualified as estimated (J) or estimated/undetected (UJ) depending on the sample concentrations.

<u>Furnace Atomic Absorption</u>: Selenium for samples MHN 626 and 628 was qualified as J or UJ because Spike Recovery Results were outside prescribed limits.

Overall Assessment: The data was minimally qualified.

SDG/MZ	ATRIX:
MHN	632

ANALYSIS: INORGANIC

SAMPLES VALIDATION: MHN 632-642

<u>Blank Results</u>: Beryllium was found in the blank at concentrations similar to samples MHN 635 and MHN 640. Therefore, Beryllium was qualified as undetected (U) in these samples (as per Functional Guidelines).

<u>Matrix Spike and Matrix Spike Duplicate Results</u>: The Matrix Spike Recoveries for Selenium, Mercury, and Thallium were less than the required 75-125%. These elements were qualified as estimated (J) or estimated/undetected (UJ) in all samples.

<u>Furnace Atomic Absorption</u>: The following table lists the elements, samples and qualifications made as a result of Post-Digestion Spikes being outside recovery limits.

<u>Element</u>	<u>Samples Qualified</u>	<u>Qualifications</u>
Pb	MHN 633-636, 638-642	J or UJ
Se	MHN 632-636, 638-641	J or UJ
Ti	All except 635, 636, 639	R

<u>ICP Interference Check Sample (ICS)</u>: The Percent Difference (%D) between the sample and the Serial Dilution was above the limit for Barium in all samples. Therefore, Barium was qualified in all samples as estimated (J).

Field Duplicates: No Traffic Report was included in the data packet, but it appeared that no Field Duplicates were included.

<u>Overall Assessment</u>: The data was minimally qualified. The major qualifications were made because of poor Furnace Atomic Absorption performance.

ATTACHMENT I

DATA ASSESSMENT SUMMARIES

INORGANIC REGIONAL DATA ASSESSMENT

-	CASE NO. 16324 LABORATORY							
	LAD							
_	SDG	# <u>MHN 621</u>						
		/ #		WER'S NAME_	,			
-	DPO	"		ETION DATE				
	210		001.112					
		DATA ASSESSM	<u>MENT SUMN</u>	MARY				
, ,			ICP	AA	Hg	CYANIDE		
	1.	HOLDING TIMES	_0	_0	_0	·····		
	2.	CALIBRATIONS	_0	_0	0	·		
~~	3.	BLANKS	_0	_0	0			
	4.	ICS	_ <u>M</u>					
	5.	LCS		_0				
	6.	DUPLICATE ANALYSIS	_0	_0	_ <u>M</u>			
	7.	MATRIX SPIKE	_M	_ <u>M</u>	_0			
,,	8.	MSA		_0				
	9.	SERIAL DILUTION	_0					
~~~	10.	SAMPLE VERIFICATION	_0	O				
	11.	OTHER QC	_0	_0	0			
-	12.	OVERALL ASSESSMENT		0	_0	<u></u>		
Ē		<ul> <li>O = Data had no problems/or qualified due to minor problems.</li> <li>M = Data qualified due to major problems.</li> <li>Z = Data unacceptable.</li> <li>X = Problems, but do not affect data.</li> </ul>						
_	ACTI	ON ITEMS:						
	AREA	AS OF CONCERN:	· · · · · · · · · · · · · · · · · · ·					
_								
-	NOTA	ABLE PERFORMANCE:						
	<del></del>		<u> </u>			·····		
_								

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# INORGANIC REGIONAL DATA ASSESSMENT

-		E NO <u>16324</u> ORATORY		REDWOOD DU SAMPLES/		
-			MATRI	X_SOIL		
		# <u>MHN 632</u>		WER (IF NOT	ESD)	
	SOW	/ #	_ REVIEW	WER'S NAME	TYLER YOF	RGASON
-	DPO	: ACTION FYI	_ COMPL	ETION DATE	OCTOBER :	17, 1991
, <b>1999</b>		DATA ASSE	ESSMENT SUMM	MARY		
			ICP	AA	Hg	CYANIDE
, and the second	1.	HOLDING TIMES	_0	0	_0	
	2.	CALIBRATIONS	_0	0	0	
-	3.	BLANKS	0	0	0	
	4.	ICS	_0			
	5.	LCS	0	0		
_	6.	DUPLICATE ANALYSIS	0	0	_0	
	7.	MATRIX SPIKE	M		M	
	8.	MSA		_0		
	9.	SERIAL DILUTION	_0			
,,	10.	SAMPLE VERIFICATION	_0	_0	_0	
	11.	OTHER QC	<u>M</u>	_ <u>M</u>		
_	12.	OVERALL ASSESSMENT	0	_0	0	······
_		<ul> <li>O = Data had no problems/or qualified due to minor prob</li> <li>M = Data qualified due to major problems.</li> <li>Z = Data unacceptable.</li> <li>X = Problems, but do not affect data.</li> </ul>	lems.			
	ACTI	ON ITEMS:				
		· · · · · · · · · · · · · · · · · · ·	,- <u>,-,-</u> ,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-,-			
-	AREA	AS OF CONCERN:			··· ····=	
gin ma	<u></u>		<u> </u>		· · · · · · · · · · · · · · · · · · ·	
-	NOTA	ABLE PERFORMANCE:				
			······································	<u>-</u>		
	<b>.</b>					

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ATTACHMENT II

DATA QUALIFICATION KEY

& LIST OF ACRONYMS

#### DATA QUALIFICATION KEY

- A Acceptable data.
- J The associated numerical value is an estimated quantity.
- R Reject data due to quality control criteria. The data is unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.
- U The compound was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.
- UJ The compound was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

#### INORGANIC ANALYSIS QUALIFIERS

C (concentration) qualifier - either B or U. B indicates that sample result is less than CRQL, but is greater than IDL. U indicates that sample result was below the IDL.

Q qualifier - Given in a column on Form I. Entered by the laboratory and indicates specific problems with quality control. Specific entries and meanings can be found on page B-20 of the 3/90 Inorganics Statement of Work.

M (method) qualifier - Given in a column on the right side of Form I. Indicates the analysis method used and reported on Form I. Specific entries and meanings can be found on page B-20 of the 3/90 Inorganics Statement of Work.

## ORGANIC ANALYSIS QUALIFIERS

- U Indicates compound was analyzed for but not detected.
- J Indicates an estimated value.
- N Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds.
- P This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X).

- C This flag applies to pesticide results where the <u>identification</u> has been confirmed by GC/MS.
- B This flag is used when the analyte is found in the associated blank as well as in the sample.
- E This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- A This flag indicates that a TIC is a suspected aldolcondensation product.
- X Other specific laboratory defined qualifier.

# LIST OF ACRONYMS

_		
	АА	Atomic Absorption
-	BNA	Base/Neutral/Acid Compounds - compounds analyzed by semivolatile technique
•	CRDL	Contract Required Detection Limit
	CRQL	Contract Required Quantitation Limit
-	GC/MS	Gas Chromatograph/Mass Spectrometer
	ICP	Inductively Coupled Plasma
-	ICS	Interference Check Sample
-	IDL	Instrument Detection Limit
-	Initial Calibration	The establishment of a calibration curve with the appropriate number of standards and concentration range. The calibration curve plots absorbance or emission versus concentration of standards.
-	IS	Internal Standards - Compounds added to every VOA and BNA standard, blank, matrix spike duplicate, and sample extract at a known concentration, prior to instrumental analysis. Internal standards are used as the basis for quantitation of the target compounds.
•	MS	Matrix Spike - introduction of a known concentration of analyte into a sample to provide information about the effect of the sample matrix on the digestion and measurement methodology.
	MS/MSD	Matrix Spike/Matrix Spike Duplicate
•	m/z	The ratio of mass (m) to charge (z) of ions measured by GC/MS.
•	%D	Percent Difference
	Pest	Pesticides
	Post digestion Spike	The addition of a known amount of standard after digestion. (Also identified as analytical spike, or spike, for furnace analyses.)

_	QC	Quality Control - Routine application of procedures for controlling the monitoring process.
-	RPD	Relative Percent Difference (between matrix spike and matrix spike duplicate).
	RRF	Relative Response Factor
	RRF	Average Relative Response Factor
-	RRT	Relative Retention Time (with relation to internal standard).
	RSD	Relative Standard Deviation
	RT	Retention Time
-	Serial Dilution	A sample run at a specific dilution to determine whether any significant chemical or physical interferences exist
-		due to sample matrix effects (ICP only).
-	SDG	Sample Delivery Group - Defined by one of the following, whichever occurs first:
_		° Case of field samples
		° Each 20 field samples within a Case
_		<ul> <li>Each 14-day calendar period during which field samples in a Case are</li> </ul>
-		received, beginning with receipt of the first sample in the SDG. (For VOA contracts, the calendar period is 7- day.)
	SOW	Statement of Work
_	SV	Semivolatile analysis - Method based on analysis by GC/MS for BNA organic compounds.
<b></b>	TCL	Target Compound List
	TIC	Tentatively Identified Compound - A compound not on the TCL.
-	VOA	Volatile Organic Analysis - Method based on the purge and trap technique for organic compound analysis.

ATTACHMENT III

SAMPLE COMPOUND QUALIFICATIONS

FORM	I	-	IN

3/90

		٦			A DAM	LE NO.
_	INORGANIC	ANALYSIS	DATA SHEE	т ļ	MHNe	
Lab Name: DATACHEM L	ABORATORIES		Contract:	68-D0-0149		
ab Code: DATAC	Case No.:	16324	SAS No.:	SDG	No.:	MHN621
<pre>Matrix (soil/water):</pre>	SOIL			Lab Sample ID	: CLP7	293
evel (low/med):	LOW			Date Received	: 05/0	3/91
ి Solids:	78.9					

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10400	-	۱	P
7440-36-0	Antimony	28.8		N	P
7440-38-2	Arsenic	21.2	17	NS	F
7440-39-3	Barium	534			P
7440-41-7	Beryllium	1.2	B		P
7440-43-9	Cadmium	6.2		1	P
7440-70-2	Calcium	33700		1	P
7440-47-3	Chromium	56.7		1	P
7440-48-4	Cobalt'	14.5		1	P
7440-50-8	Copper	375			P
7439-89-6	Iron	104000			P
7439-92-1	Lead	553			F
7439-95-4	Magnesium	8360			P
7439-96-5	Manganese	529			P
7439-97-6	Mercury	0.41	$\square$	N*	CV
7440-02-0	Nickel	72.7			P
7440-09-7	Potassium	3200			P
7782-49-2	Selenium	0.25	V	N	F
7440-22-4	Silver	2.0	В		P
7440-23-5	Sodium	1040	В		P
7440-28-0	Thallium	0.36	В		F
7440-62-2	Vanadium	26.3			P
7440-66-6	Zinc	2580			P
	Cyanide				NR

lo ⁻ or	Before:	BROWN	Clarity	Before:	Texture:	MEDIUM
Color	After:	YELLOW	Clarity	After:	Artifacts:	
lo men	ts:				2	

U.S. EPA - CLP

EPA SAMPLE NO.

Clarity Before:

Clarity After:

FORM I - IN

			1						
-	I	NORGANIC A	NALYSIS DATA S	ΗE	ET		ļ		
Lab Name: DAT	ACHEM LABOR	ATORIES	Contra	ct	: 68-D0	0-01	49	MHN	622
Lab Code: DAT	AC C	ase No.: 1	6324 SAS No	.:			SDG	No.:	MHN621
	water): SOI	L			Lab Sa	mpl	e ID	CLP	7294
level (low/me	d): LOW				Date F	lece	ived	05/	03/91
⊰ Solids:	72.	5							
Coi	ncentration	Units (ug,	/L or mg/kg dr	y v	weight)	: M	G/KG		
-	1			1	·		1		
	CAS No.	Analyte	Concentration	c	Q	M			
	7429-90-5		8250		 	P	ļ f		
	7440-36-0	Antimony	6.6	1	N	P	ປັ		
	7440-38-2	Arsenic	10.8	ΪZ	N	F	J		
	7440-39-3		198	I	L	P			
	7440-41-7	·		) <u>B</u>	[	P	3 U	44	
	7440-43-9	Cadmium	3.3		1	P	は		
	7440-70-2	Calcium	36700			IP			

U.S. EPA - CLP

14.2

59.9

9710

21100

219

250

9.1

VN*

UN N

U

B

B

0.14

3550

0.28

1.1

21.8

112

836

0.32 |B|

4.1 |B|

EPA SAMPLE NO.

Texture: MEDIUM

3

Artifacts:

P

P

P

P

F

P

Ρ

Ρ

Ρ

P

P

F

Ρ

Ρ

NR

CVVJ

FUJ

lc ments:

Color After: COLORLESS

Comor Before: BROWN

7440-47-3

7440-48-4

7440-50-8

7439-89-6

7439-92-1

7439-95-4

7439-96-5

7439-97-6

7440-02-0

7440-09-7

7782-49-2

7440-22-4

7440-23-5

7440-28-0

7440-62-2

7440-66-6

Chromium

Magnesium

Manganese

Potassium

Selenium

Thallium

Vanadium

Cyanide

Mercury

Nickel

Silver

Sodium

Zinc

Cobalt

Copper

Iron

Lead

Clarity Before:

Clarity After:

7440-23-5 |Sodium

7440-66-6

lolor Before: BROWN

Coments:

Color After: COLORLESS

7440-28-0 | Thallium

7440-62-2 | Vanadium

Zinc

Cyanide

FORM I - IN

MEDIUM

4

P

F

P

P

NR

Texture:

Artifacts:

121 |B|

וֹּע

0.22

15.6

49.7

-	I	NORGANIC A	NALYSIS DATA S	HEET		
Lab Name: DAT	ACHEM LABOR	ATORIES	Contra	act: 68-D0	-0149	MHN623
 	AC C	ase No.: 1	6324 SAS No	.:	SD	G No.: MHN621
	water): SOI	L		Lab Sa	mple I	D: CLP7295
Low Date Received:						d: 05/03/91
🔺 Solids:	89.	8				
Co	ncentration	Units (ug,	/L or mg/kg dr	y weight)	: MG/K	G
-						
	CAS No.	Analyte 	Concentration	C Q	M	
	7429-90-5		5650		P	
	7440-36-0		12.8	BN	PJ	
	7440-38-2	· ····	3.3	<u>N</u>	F J	
	7440-41-7		0.39		P U	
	7440-43-9		0.68	B B	PUL	
	7440-70-2	Calcium	61300		P	
-	7440-47-3	Chromium	14.6		P	
	7440-48-4	Cobalt	4.3	B	P	
	7440-50-8	Copper	17.9	1	P	
	7439-89-6	Iron	8590	<u> </u>	P	
	7439-92-1	Lead	15.5	[	F	
	7439-95-4			!	P	
-	7439-96-5	the second se		TTINT	P	
	<u>7439-97-6</u>   <u>7440-02-0</u>	Mercury Nickel	0.11 7.4	UN*	P	
	7440-02-0		1580	<u>B </u>		
-	7782-49-2		0.22	U N	FUJ	
	7440-22-4	Silver	0.89		P	
				:	<u>!</u>	

1

EPA SAMPLE NO.

U.S. EPA - CLP

-			
	U.S. EPA -	CTA	EPA SAMPLE NO.
-	INORGANIC ANALYSIS	DATA SHEET	MUNGOA
Lab Name: DATACHEM L	ABORATORIES	Contract: 68-D0-01	MHN624
Jab Code: DATAC	Case No.: 16324	SAS No.:	SDG No.: MHN621
Matrix (soil/water):	SOIL	Lab Sampl	e ID: CLP7296
evel (low/med):	LOW	Date Rece	ived: 05/03/91
_≵ Solids:	81.3		
Concentra	tion Units (ug/L or m	g/kg dry weight): M	IG/KG
		·····	- ₁

-	1			1		F	1
	CAS No.	Analyte	Concentration	С	Q	M	
_	7429-90-5	Aluminum	9920	-		P	6 
	7440-36-0	Antimony	5.9	V	N	P	05
	7440-38-2	Arsenic	9.4	$\overline{7}$	N	F	J
_	7440-39-3	Barium	126			P	1
-	7440-41-7	Beryllium	0.58	B		P	U.
	7440-43-9	Cadmium	0.85	B		P	jut
	7440-70-2	Calcium	50700	Ì		P	İ
_	7440-47-3	Chromium	16.5			P	İ
	7440-48-4	Cobalt	6.0	B		P	İ
	7440-50-8	Copper	47.5			P	
-	7439-89-6	Iron	14800			P	İ
	7439-92-1	Lead	214		S	F	
	7439-95-4	Magnesium	12400			P	
	7439-96-5	Manganese	293		· · · · · · · · · · · · · · · · · · ·	P	
	7439-97-6	Mercury	0.22	$\overline{Z}$	N*	CV	J
	7440-02-0	Nickel	13.8			P	
	7440-09-7	Potassium	3290			P	
<del>-</del>	7782-49-2	Selenium	0.25	Ø	N	F	UJ
	7440-22-4	Silver	0.98	U		P	
	7440-23-5	Sodium	566	B		P	
_	7440-28-0	Thallium	0.32	B		F	
	7440-62-2	Vanadium	24.1			P	
	7440-66-6	Zinc	103			P	
ĺ		Cyanide		ī		NR	
- i			·	1		i	
		······································	,	- '	······································	'	

Color	Before:	BROWN	Clarity	Before:	Texture:	MEDIUM
C_or	After:	COLORLESS	Clarity	After:	Artifacts:	
Comer	nts:					

U.S. EPA - CLP

EPA SAMPLE NO.

	<u> </u>		
-	INORGANIC ANALYSIS	5 DATA SHEET	MHN625
Lab Name: DATACHEM L	ABORATORIES	Contract: 68-D0-0149	
Lab Code: DATAC	Case No.: 16324	SAS No.: SE	OG No.: MHN621
Matrix (soil/water):	SOIL	Lab Sample I	D: CLP7297
Level (low/med):	LOW	Date Receive	d: 05/03/91
\prec Solids:	86.6		

Concentration Units (ug/L or mg/kg dry weight): MG/KG

	<u></u>	······································		·····			
CAS No.	   Analyte	Concentration	C	   Q	M		
7429-90-5	Aluminum	8980	-	! 		1	
7440-36-0	Antimony	8.4	B	N	P	i J	
7440-38-2	Arsenic	8.8		N	F	IJ	
7440-39-3	Barium	145	<u> </u>		P		
7440-41-7	Beryllium	0.82	B	i	P	i UL	
7440-43-9	Cadmium	0.69	ί <del>υ</del>		P		Ty
7440-70-2	Calcium	40300	i —		P	Ì	
7440-47-3	Chromium	12.4			P	i	
7440-48-4	Cobalt	5.7	B		P	İ	
7440-50-8	Copper	22.0			P	İ	
7439-89-6	Iron	13800			P	i	
7439-92-1	Lead	24.5		S	F	i	
7439-95-4	Magnesium	9030			P	i	
7439-96-5	Manganese	328			P	į	
7439-97-6	Mercury	0.12	V	N*	CV	TUJ	
7440-02-0	Nickel	14.4			P	İ	
7440-09-7	Potassium	2860			P	1	
7782-49-2	Selenium	0.23	চ	N	F	UJ	
7440-22-4	Silver	0.92	Ū		P	İ	
7440-23-5	Sodium	85.6	B		P	ĺ	
7440-28-0	Thallium	0.26	B	······································	F		
7440-62-2	Vanadium	17.6			P	1	
7440-66-6	Zinc	55.2			P		
	Cyanide				NR		

:~lor	Before:	BROWN	Clarity	Before:	Texture:	MEDIUM
jotor	After:	COLORLESS	Clarity	After:	Artifacts:	
Camer	nts:					6

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U.S. EPA - CLP

EPA SAMPLE NO.

Concentration Units (ug/L or mg/kg dry weight): MG/KG

							1
	CAS No.	Analyte	Concentration	10	Q	M	1
	7429-90-5	Aluminum	5590	 		P	1
	7440-36-0	Antimony	30.0	17	N	P	្រៃ
	7440-38-2	Arsenic	4.7	i7	N	F	J
	7440-39-3	Barium	61.6	<u> </u>		P	
	7440-41-7	Beryllium	0.54	B	1	P	7 U 14
	7440-43-9	Cadmium	0.84	B		P	U I
1	7440-70-2	Calcium	292000			P	1
	7440-47-3	Chromium	21.8			P	
	7440-48-4	Cobalt	1.5	B		P	1
ł	7440-50-8	Copper	11.4			P	1
	7439-89-6	Iron	9900			P	
	7439-92-1	Lead	15.5		S	F	1
	7439-95-4	<u>Magnesium</u>	9770			P	
	7439-96-5	Manganese	117			P	1
	7439-97-6	Mercury	0.11	V	N*	CV	NJ VJ
	7440-02-0	Nickel	11.7			P	
	7440-09-7	Potassium	1740			P	
	7782-49-2	<u>Selenium</u>	0.23	·	NW	F	05
1	7440-22-4	<u>Silver</u>	0.91	Ω		P	
	7440-23-5	Sodium	255	B		P	
	7440-28-0	Thallium	0.23	Ū		F	
	7440-62-2	Vanadium	44.8	_		P	
	7440-66-6	Zinc	28.9			P	
1		<u>Cyanide</u>				NR	
1		l					

Color Before: BROWNClarity Before:Texture: MEDIUMColor After: COLORLESSClarity After:Artifacts:Comments:Clarity After:Artifacts:

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EPA SAMPLE NO.

		1			
-	INORGANIC	ANALYSIS	DATA SHEE	T	MHN627
Lab Name: DATACHEM L	ABORATORIES		Contract:	68-D0-0149	
Jab Code: DATAC	Case No.:	16324	SAS No.:	SDG	No.: MHN621
Matrix (soil/water):	SOIL			Lab Sample ID	: CLP7299
evel (low/med):	LOW		:	Date Received	: 05/03/91
<u>چ</u> Solids:	82.3				

Concentration Units (ug/L or mg/kg dry weight): MG/KG

	CAS No.	Analyte	Concentration	  C	Q	M	
	7429-90-5	Aluminum	6770	_ 	N	P P	IJ
	7440-38-2	Arsenic	11.5		NS		J
	7440-39-3	Barium	263			IP	ĺ
	7440-41-7	Beryllium	0.81	B		P	JUr,
	7440-43-9	Cadmium	1.3	Z		P	lt
	7440-70-2	Calcium	57500			P	
-	7440-47-3	Chromium	17.2			P	
	7440-48-4	Cobalt	4.4	В		P	1
	7440-50-8	Copper	58.0			P	
	7439-89-6	Iron	12800			<u>  P</u>	
	7439-92-1	Lead	268		S	F	
	7439-95-4	Magnesium	8430_			P	
	7439-96-5	Manganese	246			P	
	7439-97-6	Mercury	0.22	$\square$	<u>N*</u>	CV	J
	7440-02-0	Nickel	13.0			<u>P</u>	
		Potassium	2270	Ļ		P	
	7782-49-2	Selenium	0.26	মা	N	F	1 <b>u</b> 7
	7440-22-4	Silver	0.97	U		P	
	7440-23-5	Sodium	181	B		<u>P</u>	
-	7440-28-0	Thallium	0.24	n		F	
	7440-62-2	Vanadium	18.0			P	1
	7440-66-6	Zinc	207	Ļ		P	ļ
		Cyanide		4		NR	
- I	i		l	_1		I	1

Color	Before:	BROWN	Clarity	Before:	Texture:	MEDIUM
loror	After:	COLORLESS	Clarity	After:	Artifacts:	

comments:

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Clarity After:

Clarity Before:

Calor Before: BROWN

Color After: YELLOW

Comments:

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	23600	_		- _P
7440-36-0	Antimony	15.9	B	N	P
7440-38-2	Arsenic	28.0	$\overline{7}$	NS	F
7440-39-3	Barium	1760		1	P
7440-41-7	Beryllium	1.5			P
7440-43-9	Cadmium	3.3	$\overline{7}$		P
7440-70-2	Calcium	80200	ĺ	ĺ	P
7440-47-3	Chromium	125	i —		P
7440-48-4	Cobalt	16.3		Ì	P
7440-50-8	Copper	235	i —		P
7439-89-6	Iron	165000	i —		P
7439-92-1	Lead	2610		1	F
7439-95-4	Magnesium	17200			P
7439-96-5	Manganese	645			P
7439-97-6	Mercury	0.77	$\overline{Z}$	N*	CV
7440-02-0	Nickel	52.5			P
7440-09-7	Potassium	1560			P
7782-49-2	Selenium	0.86	B	NW	F
7440-22-4	Silver	1.4	B		P
7440-23-5	Sodium	2910			P
7440-28-0	Thallium	0.27	U		F
7440-62-2	Vanadium	39.3			P
7440-66-6	Zinc	1570			P
	Cyanide				NR

74.5

1 INORGANIC ANALYSIS DATA SHEET MHN628 Lab Name: DATACHEM LABORATORIES Contract: 68-D0-0149 Lab Code: DATAC Case No.: 16324 SAS No.: SDG No.: MHN621 Matrix (soil/water): SOIL Lab Sample ID: CLP7300 Level (low/med): LOW Date Received: 05/03/91

-% Solids:

Concentration Units (ug/L or mg/kg dry weight): MG/KG

3/90

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Texture: MEDIUM

Artifacts:

U.S. EPA - CLP

EPA SAMPLE NO.

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EPA SAMPLE NO.

		l			
	INORGANIC	ANALYSIS	DATA SHEE	Г	MHN629
Lab Name: DATACHEM	LABORATORIES		Contract:	68-D0-0149	
Lab Code: DATAC	Case No.:	16324	SAS No.:	SDC	G No.: MHN621
_Matrix (soil/water)	: SOIL		:	Lab Sample II	D: CLP7301
Level (low/med):	LOW		1	Date Received	<b>l: 05/</b> 03/91
-% Solids:	77.3				

Concentration Units (ug/L or mg/kg dry weight): MG/KG

i					-
Analyte	Concentration	С	Q	M	
Aluminum	8070	—		P	1
Antimony	11.9	R	N	P	1
Arsenic	4.9	7	N	F	13
Barium	230			P	
Beryllium	0.86	₿∕		P	JU UT4
Cadmium	1.1	Ø		P	JUry
Calcium	79100			P	
Chromium	12.6			P	Ì
Cobalt	5.8	B		P	Ì
Copper	40.5			P	ĺ
Iron	21500			P	
Lead	68.2			F	
Magnesium	33000			P	1
Manganese	261			P	1
Mercury	0.15	Ζ	N*	CV	15
Nickel	10.9			P	
Potassium	2910			P	1
<u>Selenium</u>	0.26		N		102
Silver	1.0	U		P	
	625	B		P	1
	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	U		-	
·	18.8			P	
·	222				ļ
<u>Cyanide</u>				NR	
	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium	Aluminum       8070         Antimony       11.9         Arsenic       4.9         Barium       230         Beryllium       0.86         Cadmium       1.1         Calcium       79100         Chromium       12.6         Cobalt       5.8         Copper       40.5         Iron       21500         Lead       68.2         Magnesium       33000         Manganese       261         Mercury       0.15         Nickel       10.9         Potassium       2910         Selenium       0.26         Silver       1.0         Sodium       625         Thallium       0.26         Vanadium       18.8         Zinc       222	Aluminum       8070         Antimony       11.9         Arsenic       4.9         Barium       230         Beryllium       0.86         Cadmium       1.1         Cadnium       1.1         Cadmium       12.6         Chromium       12.6         Cobalt       5.8         B       Copper         40.5       1         Iron       21500         Lead       68.2         Magnesium       33000         Manganese       261         Mercury       0.15         Nickel       10.9         Potassium       2910         Sodium       625	Aluminum       8070         Antimony       11.9       B         Arsenic       4.9       N         Barium       230       Beryllium       0.86         Beryllium       0.86       B         Cadmium       1.1       B         Calcium       79100       Chromium         Chromium       12.6       Cobalt         Cobalt       5.8       B         Copper       40.5       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Iron       21500       Image: Copper 40.5         Marganesium       33000       Image: Copper 40.5         Marganesium       0.15       Image: Copper 40.5         Nickel       10.9       Image: Copper 40.5         Silver       1.0       Ima	Aluminum       8070       P         Antimony       11.9       B       P         Arsenic       4.9       N       F         Barium       230       P         Beryllium       0.86       P       P         Cadmium       1.1       P       P         Cadmium       1.1       P       P         Cadmium       1.1       P       P         Calcium       79100       P       P         Chromium       12.6       P       P         Cobalt       5.8       P       P         Cobalt       5.8       P       P         Iron       21500       P       P         Iron       21500       P       P         Lead       68.2       F       P         Magnesium       33000       P       P         Mercury       0.15       N*       CV         Nickel       10.9       P       P         Selenium       0.26       W       F         Silver       1.0       U       P         Sodium       625       P       P         Thallium       0.26 <td< td=""></td<>

Color	Before:	BROWN	Clarity	Before:	Texture:	MEDIUM
Color	After:	COLORLESS	Clarity	After:	Artifacts:	

C mments:

-		U.S.	EPA - CLF				EPA SAMP	LE NO.
- Lab Name: DAT.		NORGANIC A ATORIES			SET : 68-D0	-0149	MHN6	
Lab Code: DAT.	AC C	ase No.: 1	6324 SA	S No.:	:	5	SDG No.: 1	MHN621
Matrix (soil/	water): SOI	L			Lab Sa	mple	ID: CLP7:	302
Jevel (low/me	d): LOW				Date R	eceiv	ved: 05/03	3/91
🐣 Solids:	87.	1						
Coi	ncentration	Units (ug	/L or mg/k	g dry	weight)	: MG/	′KG	
-	CAS No.	Analyte	  Concentra	tion		M		
parasi	7429-90-5	·		$\frac{210}{2}$		P		

	CAS No.	Analyte	Concentration	C	Q	M	
	$\begin{array}{r} \hline 7429-90-5\\ \hline 7440-36-0\\ \hline 7440-38-2\\ \hline 7440-39-3\\ \hline 7440-41-7\\ \hline 7440-43-9\\ \hline 7440-43-9\\ \hline 7440-47-3\\ \hline 7440-47-3\\ \hline 7440-48-4\\ \hline 7440-50-8\\ \hline 7439-89-6\\ \hline 7439-92-1\\ \hline 7439-95-4\\ \hline 7439-95-4\\ \hline 7439-95-4\\ \hline 7439-95-4\\ \hline 7439-97-6\\ \hline 7440-02-0\\ \hline 7440-02-0\\ \hline 7440-02-7\\ \hline 7782-49-2\\ \hline 7440-23-5\\ \hline 7440-28-0\\ \hline \end{array}$	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium	$\begin{array}{r} 1210\\ 12.4\\ 7.0\\ 38.2\\ 0.28\\ 0.69\\ 107000\\ 2.5\\ 1.7\\ 5.6\\ 4520\\ 5.2\\ 36800\\ 129\\ 0.11\\ 7.2\\ 345\\ 0.23\\ 0.92\\ 272\\ 0.23\\ \end{array}$		N N N N*		ſų
	7440-28-0	Thallium					
	7440-62-2 7440-66-6	Vanadium Zinc Cyanide	<u>7.0</u> 18.3	B		P P NR	
I	l	I	I	_!	ł	I	

oror	Before:	BROWN	Clarity	Before:	Texture:	MEDIUM
orot	After:	COLORLESS	Clarity	After:	Artifacts:	
'c mer	nts:					

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EPA SAMPLE NO.

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<b>~</b>	INORGANIC ANA	LYSIS DATA SHEET		MHN631
Lab Name: DATACHEM LA	ABORATORIES	Contract:	68-D0-0149	
Lab Code: DATAC	Case No.: 163	SAS No.:	SDG	No.: MHN621
_Matrix (soil/water):	SOIL	Li	ab Sample ID:	CLP7303
Level (low/med):	LOW	Da	ate Received:	05/03/91
-% Solids:	70.4			

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Q N NS	M P P F P P P P P P P	<b>1</b>
	P F P P P P	J 
	F P P P P	J J
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	P P P	ĺ
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	P	İ
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	P	1
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	Ρ	
	P	
N	F	UJ
	Р	ĺ
	Ρ	
	F	
1	P	
	P	
	NR	
	N	N F P P F P P

C lor Before:	BROWN	Clarity	Before:	Texture:	MEDIUM
Color After:	COLORLESS	Clarity	After:	Artifacts:	A lalal
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SAMPLE NO.

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INORGANIC	ANALYSTS	DATA	SHEET	

	INORGANIC AN	ALYSIS DATA SHEET	MHN632
Lab Name: DATACHEM L	ABORATORIES	Contract:	68-D0-0149
-Lab Code: DATAC	Case No.: 16	5324 SAS No.:	SDG No.: MHN632
Matrix (soil/water):	WATER	I	Lab Sample ID: CLP7304
Level (low/med):	LOW	Γ	Date Received: 05/03/91
% Solids:	0.0		

Concentration Units (ug/L or mg/kg dry weight): UG/L

	CAS No.	   Analyte	  Concentration	  C	l Q	M	
	7429-90-5	Aluminum	1380			P	
	7440-36-0	Antimony	24.0	ប៊	i	P	
	7440-38-2	Arsenic	16.7	i –	í	F	
	7440-39-3	Barium	69.4	i B'	E		J
1	7440-41-7	Beryllium	1.0		i	P	
	7440-43-9	Cadmium	3.0	ប៊		P	
	7440-70-2	Calcium	46500	-		P	
	7440-47-3	Chromium	6.0	ប			
	7440-48-4	Cobalt	5.0	ប៊		P	
	7440-50-8	Copper	19.0	B		P	
	7439-89-6	Iron	1460	-		P	
	7439-92-1	Lead	23.6		S	F	
	7439-95-4	Magnesium	16000		······································		
	7439-96-5	Manganese	33.0			P	
	7439-97-6	Mercury	0.20	Ī	N	CV	UJ
	7440-02-0	Nickel	12.0	ប			
	7440-09-7	Potassium	14400			P	
	7782-49-2	Selenium	2.5	B	NW		J
	7440-22-4	Silver	4.0	τ		P	
	7440-23-5	Sodium	112000	Ī		P	
	7440-28-0	Thallium	10.0 1.0	V	NW	F	UJ
	7440-62-2	Vanadium	6.8	B		P	
	7440-66-6	Zinc	62.7	_1		P	
		Cyanide	1	_1		NR	
				-			

Color Before: COLORLESS Clarity Before: CLEAR Texture: Artifacts: C or After: COLORLESS Clarity After: CLEAR Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

SAMPLE NO.

l INORGANIC ANALYSIS DATA SHEET

		<b>a</b> 1 1 60	MHN633
Lab Name: DATACHEM LA	ABORATORIES	Contract: 68	B-D0-0149
-Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG No.: MHN632
Matrix (soil/water):	WATER	Lab	Sample ID: CLP7305
Level (low/med):	LOW	Dat	e Received: 05/03/91
_% Solids:	0.0		

Concentration Units (ug/L or mg/kg dry weight): UG/L

1	1			,		
CAS No.	Analyte	  Concentration	   C	Q	M	   
7429-90-5	Aluminum	728	_		P	} [
7440-36-0	Antimony	25.0	B	i	P	
7440-38-2	Arsenic	53.4	-	i	F	l
7440-39-3	Barium	72.7	B	Ē	P	J
7440-41-7	Beryllium	1.0	Ū		P. P. P.	
7440-43-9	Cadmium	3.0	Ū		P	1
7440-70-2	Calcium	56300			P	1
7440-47-3	Chromium	6.0	ប		P P	1
7440-48-4	Cobalt	5.0	Ū		<u> </u>	
7440-50-8	Copper	14.7	B			
7439-89-6	Iron	1060	=		P	
7439-92-1	Lead	8.0	·	W		
7439-95-4	Magnesium	36500	-	·		
7439-96-5	Manganese	92.4	-		P	
7439-97-6	Mercury	0.20	Ø	N	CV	υJ
7440-02-0	Nickel	12.0	Ū			-
7440-09-7	Potassium	37000	-i			
7782-49-2	Selenium	3.0	B	NW	F	J
7440-22-4	Silver	4.0	์ซิไ		P	
7440-23-5	Sodium	460000	-i		P	
7440-28-0	Thallium	10.0	π	NW	P F	UJ
7440-62-2	Vanadium	8.4	B		P	
7440-66-6	Zinc	53.9			P	
	Cyanide		-¦	<u> </u>	NR	
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Color Before: COLORLESSClarity Before: CLEARTexture:C lor After: COLORLESSClarity After: CLEARArtifacts:

Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.



SAMPLE NO.

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SAMPLE NO.

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INORGANIC	ANALYSIS	DATA	SHEET	

Lab Name: DATACHEM L	ABORATORIES	Contract:	MHN634 68-D0-0149
Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG No.: MHN632
Matrix (soil/water):	WATER	]	Lab Sample ID: CLP7306
Level (low/med):	LOW	I	Date Received: 05/03/91
_% Solids:	0.0		

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	М	
7429-90-5	<u></u>		<u> </u> _		<u> </u>	
	Aluminum	666	=	!	<u>P</u>	
7440-36-0	Antimony	24.0	U		<u>P</u>	
7440-38-2	Arsenic	59.2		<u> </u>	P F P	
7440-39-3	Barium	76.6	B	<u>E</u>		J
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	3.0	Ū		P	
7440-70-2	Calcium	70800	-		P	
7440-47-3	Chromium	6.0	Ū			
7440-48-4	Cobalt	5.0	Ū		P	
7440-50-8	Copper	24.3	B		P	
7439-89-6	Iron	710			P	
7439-92-1	Lead	4.8		W	F	
7439-95-4	Magnesium	48200			P	
7439-96-5	Manganese	98.5			P	
7439-97-6	Mercury	0.20	V	N	CV	υJ
7440-02-0	Nickel	12.0	Ū		P	
7440-09-7	Potassium	53900			P P F	
7782-49-2	Selenium	2.5	B	NW	F	J
7440-22-4	Silver	4.0	Ū		P	
7440-23-5	Sodium	598000	-		<u>P</u> P F	
7440-28-0	Thallium	10.0	ষ্ট	NW	F	UJ
7440-62-2	Vanadium	6.1	B		P	
7440-66-6	Zinc	62.3			P	
11	Cyanide		<u> </u>		NR	

Color Before: COLORLESSClarity Before: CLEARTexture:Color After: COLORLESSClarity After: CLEARArtifacts:Comments:Comments:Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

SAMPLE NO.

|

l INORGANIC ANALYSIS DATA SHEET

Lab Name: DATACHEM LAB	ORATORIES	Contract:	MHN635   68-D0-0149
Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG No.: MHN632
Matrix (soil/water): W	ATER		Lab Sample ID: CLP7307
evel (low/med): Lo	OW		Date Received: 05/03/91
<u>%</u> Solids: 0	.0		

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.       Analyte       Concentration       C       Q       M         7429-90-5       Aluminum       1690       P       P         7440-36-0       Antimony       24.0       U       P         7440-38-2       Arsenic       186       F       F         7440-39-3       Barium       103       P       P       J         7440-41-7       Beryllium       1.4       P       J         7440-43-9       Cadmium       3.0       U       P         7440-43-9       Calcium       40900       P         7440-47-3       Chromium       9.5       P       P         7440-48-4       Cobalt       9.4       P       P         7439-92-1       Lead       4.6       W       F         7439-92-1       Lead       4.6       W       F         7439-95-4       Magnesium       157000       P       P         7440-02-0       Nickel       26.9       P       P         7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       P       P       UJ       P	1	1	· · · · · · · · · · · · · · · · · · ·	1	1	1	1
7440-36-0       Antimony       24.0       U       P         7440-38-2       Arsenic       186       F         7440-39-3       Barium       103       P       F         7440-41-7       Beryllium       1.4       P       U         7440-43-9       Cadmium       3.0       U       P         7440-43-9       Cadmium       3.0       U       P         7440-43-9       Cadmium       9.5       B       P         7440-47-3       Chromium       9.5       B       P         7440-48-4       Cobalt       9.4       B       P         7439-89-6       Iron       2870       P         7439-92-1       Lead       4.6       W       F         7439-95-4       Magnesium       157000       P       P         7439-96-5       Manganese       780       P       P         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P       VJ         7440-02-0       Nickel       26.9       B       P       P         7440-02-4       Selenium       10.0 <t< td=""><td>CAS No.</td><td>  Analyte</td><td>Concentration</td><td>c</td><td>    Q</td><td>M</td><td>1</td></t<>	CAS No.	Analyte	Concentration	c	   Q	M	1
7440-36-0       Antimony       24.0       U       P         7440-38-2       Arsenic       186       F         7440-39-3       Barium       103       P       F         7440-41-7       Beryllium       1.4       P       U         7440-43-9       Cadmium       3.0       U       P       U         7440-43-9       Cadmium       3.0       U       P       U         7440-43-9       Cadmium       3.0       U       P       U         7440-43-9       Cadmium       3.0       U       P       U         7440-43-9       Cadmium       9.5       B       P       U         7440-47-3       Chromium       9.5       B       P         7440-48-4       Cobalt       9.4       B       P         7439-89-6       Iron       2870       P       P         7439-92-1       Lead       4.6       W       F         7439-95-4       Magnesium       157000       P       P         7439-97-6       Mercury       0.20       V       N       CV       V         7440-02-0       Nickel       26.9       B       P       P	7429-90-5	Aluminum	1690	-	 	P	i I
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	7440-36-0	·	·	ប៊		P	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	1			Ē		F	[
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	·	·	· ······	B'	Ē	P	5
7440-43-9       Cadmium       3.0       U       P         7440-70-2       Calcium       40900       P         7440-47-3       Chromium       9.5       B       P         7440-48-4       Cobalt       9.4       P       P         7440-50-8       Copper       15.2       B       P         7439-89-6       Iron       2870       P         7439-92-1       Lead       4.6       W       F         7439-95-4       Magnesium       157000       P         7439-96-5       Manganese       780       P         7440-02-0       Nickel       26.9       P         7440-09-7       Potassium       185000       P         7782-49-2       Selenium       10.0       P         7440-22-4       Silver       4.0       U       P	7440-41-7	·		Ī		P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P		Cadmium				P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P		·		-		P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P		·	· ····································	B		P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P	7440-48-4			B		P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P		Copper	15.2			P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P	7439-89-6			i — I		P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P	7439-92-1	Lead	4.6		W	F	ĺ
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P	7439-95-4	Magnesium	157000	i — i		P	
7439-97-6       Mercury       0.20       V       N       CV       UJ         7440-02-0       Nickel       26.9       B       P       P         7440-09-7       Potassium       185000       P       P         7782-49-2       Selenium       10.0       V       NW       F       UJ         7440-22-4       Silver       4.0       U       P	7439-96-5	· · · · · · · · · · · · · · · · · · ·	780	-		P	
7440-02-0       Nickel       26.9       B       P         7440-09-7       Potassium       185000       P         7782-49-2       Selenium       10.0       V       NW       F       VJ         7440-22-4       Silver       4.0       U       P	7439-97-6	Mercury	0.20	ন্দ	N	CV	υJ
7440-22-4 Silver 4.0 U	7440-02-0	Nickel	26.9				
7440-22-4 Silver 4.0 U	7440-09-7	Potassium	185000			P	
	7782-49-2	Selenium	10.0	V	NW	F	υJ
<u>7440-23-5</u> Sodium 6030000   P	7440-22-4	Silver	4.0	Ū		P	
	7440-23-5	Sodium	6030000			P	
7440-28-0 Thallium 10.0 WNW F R	7440-28-0	Thallium	10.0	$\overline{\mathcal{Y}}$	NW	F	R
7440-62-2 Vanadium 38.7 B P	7440-62-2	Vanadium	38.7				
7440-66-6 Zinc 26.9 P	7440-66-6		26.9			P	
Cyanide		Cyanide				NR	

 Color Before: COLORLESS
 Clarity Before: CLEAR
 Texture:

 Construction
 Clarity After: CLEAR
 Artifacts:

 Comments:
 Comments:
 Clarity After: CLEAR

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

SAMPLE NO.

8

1 INORGANIC ANALYSIS DATA SHEET

Lab Name: DATACHEM I	ABORATORIES	Contract:	68-D0-0149	MHN636
Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG	No.: MHN632
Matrix (soil/water):	WATER		Lab Sample ID	: CLP7308
Level (low/med):	LOW		Date Received	: 05/03/91

_% Solids:

Concentration Units (ug/L or mg/kg dry weight): UG/L

0.0

			1	1		1
CAS No.	Analyte	Concentration	C	Q	M	1
7429-90-5	Aluminum	234		!	P	1
7440-36-0	Antimony	24.0	Ū	i	P	i
7440-38-2	Arsenic	248	i –	i	F	
7440-39-3	Barium	29.9	B	Ē	P	J
7440-41-7	Beryllium	1.0	Ū		P	
7440-43-9	Cadmium	3.0	บั		P	Ì
7440-70-2	Calcium	30600	i –		P	İ
7440-47-3	Chromium	10.0			P P	İ
7440-48-4	Cobalt	8.2	B		P	ĺ
7440-50-8	Copper	96.1	_			İ
7439-89-6	Iron	148	_		P P F	Í
7439-92-1	Lead	1.0	ប	W	F	İ
7439-95-4	Magnesium	92900	_		P	
7439-96-5	Manganese	97.7	_		P	ĺ
7439-97-6	Mercury	0.20	Ū,	N	CV	υJ
7440-02-0	Nickel	40.0				
7440-09-7	Potassium	157000			P P F	
7782-49-2	Selenium	14.8	B	NW	F	J
7440-22-4	Silver	4.0	Ū		P	
7440-23-5	Sodium	5420000			P	
7440-28-0	Thallium	10.0	٧	EN	F	R
7440-62-2	Vanadium	78.3			P	
7440-66-6	Zinc '	29.8	_i		P	
	Cyanide		<u> </u>		NR	

Color Before: COLORLESSClarity Before: CLEARTexture:C lor After: COLORLESSClarity After: CLEARArtifacts:

Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

E - THALLIUM/FURNACE, SAMPLE INTERFERENCE PROBLEMS.

SAMPLE NO.

1 INORGANIC ANALYSIS DATA SHEET

Lab Name: DATACHEM LA	BORATORIES	Contract: 6	MHN637 3-D0-0149
-Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG No.: MHN632
Matrix (soil/water):	WATER	Lal	o Sample ID: CLP7309
Level (low/med):	LOW	Dat	te Received: 05/03/91
<pre>% Solids:</pre>	0.0		

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	  Concentration	   C	   Q	   M	
7429-90-5	Aluminum	385	 	 	P	1
7440-36-0	Antimony	24.0	ĪŪ	i	P	ĺ
7440-38-2	Arsenic	40.8	i —	i	F	
7440-39-3	Barium	429	17	Ē	P	J
7440-41-7	Beryllium	1.0	Ū		P	
7440-43-9	Cadmium	3.0	Ū		P	İ
7440-70-2	Calcium	59600	í —	·		İ
7440-47-3	Chromium	6.0	ប៊	i	P	
7440-48-4	Cobalt	5.0	ប៊		P P P	ĺ
7440-50-8	Copper	5.0	Ū		P	
7439-89-6	Iron	1260			P	
7439-92-1	Lead	9.7	—		P F	
7439-95-4	Magnesium	63200	—		P	
7439-96-5	Manganese	538			P	
7439-97-6	Mercury	0.20	Ī	N	CV	υJ
7440-02-0	Nickel	15.9	B		P	
7440-09-7	Potassium	70300			P	
7782-49-2	Selenium	1.0	চ্চ	N	F	UJ
7440-22-4	Silver	4.0	τī		P	
7440-23-5	Sodium	202000			P	
7440-28-0	Thallium	1.0	V	NW	F	UJ
7440-62-2	Vanadium	4.6	B		P	
7440-66-6	Zinc	16.4	B		P	
	Cyanide		_i		NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture: C lor After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

SAMPLE NO.

1

INORGANIC ANALYSIS DATA SHEET

Lab Name: DATACHEM L	ABORATORIES	Contract: 68-D0-01	19
-Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG No.: MHN632
Matrix (soil/water):	WATER	Lab Sample	≥ ID: CLP7310
Level (low/med):	LOW	Date Rece	ived: 05/03/91

% Solids:

0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

I	1	1	1	1	1	1
CAS No.	Analyte	Concentration	c	Q	M	1
7429-90-5	Aluminum	260		!	P	1
7440-36-0	Antimony	24.0	ប៊		·	
7440-38-2	Arsenic	314	-		F	
7440-39-3	Barium	472	7	Ē	$\frac{P}{F}$	J
7440-41-7	Beryllium	1.0	Ū			
7440-43-9	Cadmium	3.0	Ū	,	P	1
7440-70-2	Calcium	13400				1
7440-47-3	Chromium	27.2			P	1
7440-48-4	Cobalt	17.3	B		P	
7440-50-8	Copper	15.2	B		P	
7439-89-6	Iron	2570	-		P	
7439-92-1	Lead	4.8		W	F	
7439-95-4	Magnesium	110000	-	<u> </u>	P	
7439-96-5	Manganese	350		····	P	
7439-97-6	Mercury		۶	N	CV	UJ
7440-02-0	Nickel	30.4	B		P	
7440-09-7	Potassium	141000	-i		P P F	
7782-49-2	Selenium		Ī	NW	F	UJ
7440-22-4	Silver	4.0	ថ		P	
7440-23-5	Sodium	495000	-i		<u>P</u> <u>P</u> F	
7440-28-0	Thallium		Ī	NW	F	UJ
7440-62-2	Vanadium	17.2	Ξİ		P	
7440-66-6	Zinc	51.0	-i		P P	
	Cyanide		-i		NR	
	······································				· ·	

Color Before: YELLOW Clarity Before: CLEAR Texture: Color After: YELLOW Artifacts: Clarity After: CLEAR

Comments:

"E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

FORM I - IN

MHN638

SAMPLE NO.

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1

INORGANIC ANALYSIS DATA SHEET

Lab Name: DATACHEM LABORATORIES	Contract: 68-D0-0149
Lab Code: DATAC Case No.: 16324	SAS No.: SDG No.: MHN632
Matrix (soil/water): WATER	Lab Sample ID: CLP7311
Level (low/med): LOW	Date Received: 05/03/91

_% Solids:

Concentration Units (ug/L or mg/kg dry weight): UG/L

0.0

	CAS No.	   Analyte	Concentration	С	Q	M	
	7429-90-5	Aluminum	560			P	
	7440-36-0	Antimony	24.0	ប		P P	
	7440-38-2	Arsenic	179				
	7440-39-3	Barium	81.7	B	E	P	J
	7440-41-7	Beryllium	1.0	Ū		F P P	
	7440-43-9	Cadmium	3.0	ប		P	
	7440-70-2	Calcium	38800	_		P	
,	7440-47-3	Chromium	6.0	Ū		P P	
	7440-48-4	Cobalt	8.2	B		<u>P</u>	
	7440-50-8	Copper	5.4	B	······································	P	
	7439-89-6	Iron	659			P	
	7439-92-1	Lead	1.1	B	W	<u>P</u> P F	
	7439-95-4	Magnesium	162000			P	
	7439-96-5	Manganese	775			P P CV	
,	7439-97-6	Mercury	0.20	Ø	N	CV	UJ
	7440-02-0	Nickel	26.2	B		P	
	7440-09-7	Potassium	196000			P P F	
•	7782-49-2	Selenium	10.0	চ	NW	F	UJ
	7440-22-4	Silver	4.0	ប៊	··		
	7440-23-5	Sodium	6250000			P	
	7440-28-0	Thallium	10.0	চ	EN	P_  P_  F	R
	7440-62-2	Vanadium	37.4	B		<u>P</u>	
	7440-66-6	Zinc	19.7	B		P	
	·	Cyanide				NR	
				· · · · ·			

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Color Before: COLORLESSClarity Before: CLEARTexture:Color After: COLORLESSClarity After: CLEARArtifacts:

Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

E - THALLIUM/FURNACE, SAMPLE INTERFERENCE PROBLEMS.

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11

MHN639

	1		· · · · · · · · · · · · · · · · · · ·	SAMPLE NO.
-	INORGANIC ANALYSIS	DATA SHEET	ר ן	MUNICAO
Lab Name: DATACHEM L	ABORATORIES	Contract:	68-D0-0149	MHN640
Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG	No.: MHN632
Matrix (soil/water):	WATER	I	Lab Sample ID	: CLP7312
<pre>_evel (low/med):</pre>	LOW	Ι	Date Received	: 05/03/91
ے Solids:	0.0			

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	М	
7429-90-5	Aluminum	251		<u></u>	P	 
7440-36-0	Antimony	34.2	B		P	İ
7440-38-2	Arsenic	41.1	1		F	
7440-39-3	Barium	395		E	P	J
7440-41-7	Beryllium	2.3	B		P	U
7440-43-9	Cadmium	3.0	ប		P	
7440-70-2	Calcium	55800			P	
7440-47-3	Chromium	6.0	ប		P	
7440-48-4	Cobalt	5.0	ប	1	P	ĺ
7440-50-8	Copper	6.7	B		P	
7439-89-6	Iron	1210	12	1	P	
7439-92-1	Lead	3.3	'		F	
7439-95-4	Magnesium	59900			<u>P</u>	l
7439-96-5	Manganese	500			P	
7439-97-6	Mercury	0.20	1	N		03
7440-02-0	Nickel	12.0	<u></u>		P	
7440-09-7	<u>Potassium</u>	67100	1	_ >×	P	
7782-49-2	Selenium	1.0	ষ্	NV	F	UJ
7440-22-4	Silver	4.0	U		P	1
7440-23-5	Sodium	197000	Ι_,		P	
7440-28-0	Thallium	1.0	Ø	NW	F	105
7440-62-2	Vanadium	7.2	B		P	
7440-66-6	Zinc	19.0	B		P	l
	Cyanide		1		NR	ĺ

Color Before: COLORLESSClarity Before: CLEARTexture:Ce.or After: COLORLESSClarity After: CLEARArtifacts:Cenments:Comments:Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

SAMPLE NO.

MHN641

1

INORGANIC ANALYSIS DATA SHEET

Lab Name: DATACHEM L	ABORATORIES	Contract: 68-D0-0149			
Lab Code: DATAC	Case No.: 16324	SAS No.:	SDG No.: MHN632		
Matrix (soil/water):	WATER	I	Lab Sample ID: CLP7313		
Level (low/med):	LOW	I	Date Received: 05/03/91		
_% Solids:	0.0				

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No. Analyte Concentration C Q M	
7429-90-5 Aluminum 104 B	
7440-36-0 Antimony 24.0 U	
7440-38-2 Arsenic 11.6 F	
7440-39-3   Barium   37.7   B E P	J
7440-41-7 Beryllium 1.0 U P	-
7440-43-9      Cadmium     3.0     U     P        7440-70-2     Calcium     54600     P	
7440-47-3 Chromium 6.0 U	
7440-48-4 Cobalt 5.0 U	
7440-50-8         Copper         21.9         B         P           7439-89-6         Iron         44.9         B         P	
7439-92-1 Lead 1.0 U	
7439-95-4 Magnesium 101000 P	
7439-96-5   Manganese   36.9   P	
7439-97-6 Mercury 0.20 0.00 N CV	UJ
7440-02-0 Nickel 12.0 U	
7440-09-7 Potassium 39600 P	
7782-49-2   Selenium   1.0   0   NW   F	VJ
7440-22-4  Silver   4.0 [U] P	
7440-23-5 Sodium 352000 P	
7440-28-0 Thallium 1.0 V NW F	UJ
7440-62-2     Vanadium     8.1     P       7440-66-6     Zinc     33.0     P	
Cyanide NR	

Color Before: COLORLESSClarity Before: CLEARTexture:Color After: COLORLESSClarity After: CLEARArtifacts:

Comments:

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.

SAMPLE NO.

	1		
INORGANIC	ANALYSIS	DATA	SHEET

	INORGANIC ANALIDID	DAIA DIILLI	MHN642
Lab Name: DATACHEM LA	ABORATORIES	Contract: 68-D0-0149	
Lab Code: DATAC	Case No.: 16324	SAS No.: SE	OG No.: MHN632
Matrix (soil/water):	WATER	Lab Sample I	D: CLP7314
Level (low/med):	LOW	Date Receive	ed: 05/03/91
🛶 Solids:	0.0		

Concentration Units (ug/L or mg/kg dry weight): UG/L

	······				<u> </u>	
CAS No.	Analyte	Concentration	с	Q	M	
7429-90-5	Aluminum	108	B		P	
7440-36-0	Antimony	24.0	ប		P	
7440-38-2	Arsenic	19.0	-		F	
7440-39-3	Barium	57.4	Þ	Ē	P	7
7440-41-7	Beryllium	1.0	Ũ		P	
7440-43-9	Cadmium	3.0	ប		P	
7440-70-2	Calcium	92300	-		P	
7440-47-3	Chromium	8.0	B		<u>P</u>   <u>P</u>	
7440-48-4	Cobalt	5.0	ប៊		P	
7440-50-8	Copper	26.2	-		P	
7439-89-6	Iron	53.7	B		P	
7439-92-1	Lead	1.0	Ū	W	F	
7439-95-4	Magnesium	87300	_		P	
7439-96-5	Manganese	222			P	
7439-97-6	Mercury	0.20	Ī	N	CV	υJ
7440-02-0	Nickel	12.0	ប		P	
7440-09-7	Potassium	57400	-		P	
7782-49-2	Selenium	7.1		N	P F	J
7440-22-4	Silver	4.0	Ũ	·		
7440-23-5	Sodium	362000	-		<u>P</u>   <u>P</u>   F	
7440-28-0	Thallium	1.0	ষ্ট	NW	F	υJ
7440-62-2	Vanadium	10.4	B		P	
7440-66-6	Zinc	23.6	- i		P	
	Cyanide		-i		NR	
			· · · ·		· · · ·	

C <u>o</u> lor Be	fore:	COLORLESS	Clarity	Before:	CLEAR	Texture:
C_lor Af	ter:	COLORLESS	Clarity	After:	CLEAR	Artifacts:
Conments	:					

E - ICP SERIAL DILUTION IS OUTSIDE OF CONTROL LIMITS.