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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

December 28, 2017

CH2M Hill Plateau Remediation Company
2420 Stevens Center Place
Mail Stop H8-41
Richland, WA 99352

Attn: Ms. Karen Waters-Husted

Subject:	SAF No:	W18-012
	SDG Number:	624416
	SwRI Project Number:	20859.01.00X
	SwRI Task Order Number:	171207-6
	SwRI Sample Receipt Number:	60847
	Samples Received	12.07.2017
	Fraction:	Various Cyanide Analyses

Dear Ms. Waters-Husted:

Please find the enclosed results for the four (04) overall water samples received on the above referenced date. If you should have any questions, please do not hesitate to call me at (210) 522-3242, or at radonna.spies@swri.org.

Sincerely,

Radonna Spies
Principal Scientist

APPROVED:

Michael J. Dammann
Director

RPS: mg
Encl

Benefiting government, industry and the public through innovative science and technology

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI ROJECT#: 20859.01.00X
SwRI TASK ORDER: 171207-6
SwRI SRR: 60847
SDG: 624416
CASE: W18-012
VTSR: 12-07-2017

CHAIN-OF-CUSTODY & SAMPLE RECEIPT PAPERWORK

swr46
9012
Total Page Count: 010001-
Fraction: 1014 Pages: 010050
Report

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C.# W18-012-193
		010002		Page 1 of 1
Collector: Juan Aguilar /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650		
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071		
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506-95170	Ice Chest No.: GWS-703		
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 77092324582		
Protocol: RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8825		

POSSIBLE SAMPLE HAZARDS/REMARK
 ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

SPECIAL INSTRUCTIONS
 N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FM45	N	W	12-6-17	1005	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FK91	Y	W	12-6-17	1005	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
 SRR # 60847
 SDG # 624416

SwRI Prjct # 20859.01.00X
 TO: 171207-6

SWRI

Relinquished By: Juan Aguilar /CHPRC Print First and Last Name	Signature	DEC 06 2017	1020	Date/Time	Received By: Malcom Chunn /CHPRC Print First and Last Name	Signature	DEC 06 2017	1020	Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: Malcom Chunn Print First and Last Name	Signature	DEC 06 2017	1400	Date/Time	Received By: FEDEX Print First and Last Name	Signature		Date/Time		
Relinquished By: FEDEX Print First and Last Name	Signature			Date/Time	Received By: David Garcia /David Garcia Print First and Last Name	Signature	12-07-2017	09:00	Date/Time	
Relinquished By: Print First and Last Name	Signature			Date/Time	Received By: Print First and Last Name	Signature		Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):						Disposed By:		Date/Time:	

CH2M Hill Plateau Remediation Company	21/165	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	010003	C.O.C. # W18-012-194
				Page 1 of 1

Collector: Juan Aguilar CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506 -95/70	Ice Chest No.: GWS-703
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 77092324582
Protocol: RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: 8825

POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	SPECIAL INSTRUCTIONS N/A
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FM46	Y	W	12-6-17	0813	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3FM47	N	W	12-6-17	0813	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CN (AMENABLE): COMMON; 9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
 SRR # 60847
 SDG # 624416

SwRI Prjct # 20859.01.00X
 TO: 171207-6
SWRI

Relinquished By: <u>Juan Aguilar</u> Print First and Last Name	DEC 06 2017 Signature	1220 Date/Time	Received By: <u>Malcom Chunn</u> Print First and Last Name	DEC 06 2017 Signature	1026 Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: <u>M.R. Chunn</u> Print First and Last Name	DEC 06 2017 Signature	1400 Date/Time	Received By: FEDEX Print First and Last Name	Signature	Date/Time	
Relinquished By: FEDEX Print First and Last Name	Signature	Date/Time	Received By: <u>David Garcia</u> Print First and Last Name	Signature	12-07-2017 09:00 Date/Time	
Relinquished By: Print First and Last Name	Signature	Date/Time	Received By: Print First and Last Name	Signature	Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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Southwest Research Institute

Laboratory Task Order

010004

TO #: 171207-6 Revision: 1

SDG: 624416
 VTSR: 12/07/17
 SAF: W18-012

SRR #'s: 60847
 Client(s): CH2M Hill Plateau Remediation Company

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 12/21/17

Instructions

CH2MHill Plateau Remediation Company. 300071
 SAF No. W18-012

SDG 624416 is open until 12/21/17

15-day TAT.
 CURRENTLY, FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 12/22/2017.

7 overall samples (7 containers) were received on 12/07/2017.
 OUT of the 7 samples, ONLY the 4 samples that required Cn, are listed here.

Sample Analysis REQUIRED
 9012 _ 57-12-5 Cyanide (Total)
 9012 _ CATC Cyanide (Amenable)
 9014 _ FREE-CN Cyanide (Free)

DATA DELIVERABLE _ Summary (Narrative / Results only)
 REQUESTER _ Karen Waters-Husted

ATTACHMENT C - QC Requirements for Chemical and Radiochemical Analysis
 Section 7.2.2 Sample Data Packages
 Section 7.2.3 Hard Copy Deliverable format
 Section 7.2.4 Final Data Package Requirements
 Section 8.8 CHPRC Electronic Address

Electronic copies of all sample receipt information, COCs, priority data packages, final data packages, corrected/revised data packages, closure reports, status reports, invoices, etc. shall be sent to: mailto:^CPP_Sample_Management@rl.gov
 REVISION 1, DRmz 12/21/17: Task Order revised to change the TAT to 15 days, per PM.

Documents Related to this task order: 233986[COC for SRR 60847], 233987[Paperwork for SRR 60847]

Deliverables --> Hard Copy: no EDD: -YES- PDF: -YES-

Test: AMENCN_9012
 Section: WETCHEM

Holding: 14 days from CED

Amenable Cyanide by SW846 9012

Cnt: 4

System ID	Type	Cont	Matrix	Customer ID	GED	Method Date
624416		1	Water	B3FK91	06 Dec 17	20 Dec 17
624417		1	Water	B3FM45	06 Dec 17	20 Dec 17
624418		1	Water	B3FM46	06 Dec 17	20 Dec 17
624419		1	Water	B3FM47	06 Dec 17	20 Dec 17

Test: CN_9012
 Section: WETCHEM

Holding: 14 days from CED

Cyanide by Method 9012 (Automated)

Cnt: 4

System ID	Type	Cont	Matrix	Customer ID	GED	Method Date
624416		1	Water	B3FK91	06 Dec 17	20 Dec 17
624417		1	Water	B3FM45	06 Dec 17	20 Dec 17
624418		1	Water	B3FM46	06 Dec 17	20 Dec 17
624419		1	Water	B3FM47	06 Dec 17	20 Dec 17

Test: CN_9014
 Section: WETCHEM

Holding: 14 days from CED

Total Cyanide by SW846 9014

Cnt: 4

System ID	Type	Cont	Matrix	Customer ID	GED	Method Date
624416		1	Water	B3FK91	06 Dec 17	20 Dec 17



Southwest Research Institute

Laboratory Task Order

010005

TO #: 171207-6 Revision: 1

Project(s): 20859.01.00X
Manager(s): SPIES, RADONNA
To Client: 12/21/17

SDG: 624416
VTSR: 12/07/17
SAF: W18-012

SRR #'s: 60847
Client(s): CH2M Hill Plateau Remediation Company

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
624417		1	Water	B3FM45	06 Dec 17	20 Dec 17
624418		1	Water	B3FM46	06 Dec 17	20 Dec 17
624419		1	Water	B3FM47	06 Dec 17	20 Dec 17



010006

Sample Receipt

Southwest Research Institute

Sample Receipt Number: 60847

VTSR: 12/07/17

Time: 09:00:00

Project: 20859.01.00X

Case #: CHPRC

Client: CH2M Hill Plateau Remediation Company

Manager: SPIES, RADONNA

Logged in by: DXGARCIA

Creation Date: 12/07/17

Notes

Samples were received intact.

Fed Ex tracking #:

7709 2324 5182 _ 20.3°C (no ice)

7709 1862 4602 _ 1.8°C (wet ice)

Ice Chest No:

GWS-695

GWS-703

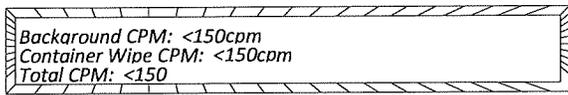
pH Test Paper 0.0 to 13.0

Lot - 230016

Exp: 10/30/2019

See chain-of-custody as part of the SRR system for more information.

Test requirements located on Task Order.



System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
624416	B3FK91	12/06/17	Water	1	
624417	B3FM45	12/06/17	Water	1	
624418	B3FM46	12/06/17	Water	1	
624419	B3FM47	12/06/17	Water	1	
624420	B3FXN1	12/05/17	Other Solid	1	
624421	B3FXN4	11/29/17	Other Solid	1	
624422	B3FXN7	12/05/17	Other Solid	1	

Containers: 7

Samples: 7

These documents are associated with this receipt: 233986[COC for SRR 60847], 233987[Paperwork for SRR 60847]

Thermometer: 021056
Temperature: NOTE

60847 CH2M Hill Plateau Remediation

010007

Southwest Research Institute

Traffic Report

Sample Custodian Signature: David Garcia



- 1. Custody Seal Present
- 2. Chain of Custody Present
- 3. Sample Tags Not Present *N/A*
Sample Tag Numbers Not on COC
- 4. SMO Forms Present

Client: CH2M Hill Plateau Remediation Company

Project: 20859.01.00X

Case: CHPRC / SDG: See T.O.

Sample Receipt: 60847

Airbill: 770918624602,770923245182

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
12/07/17	09:00:00	W18-012-193	B3FK91	N/A	624416	YES	Intact
12/07/17	09:00:00	W18-012-193	B3FM45	N/A	624417	YES	Intact
12/07/17	09:00:00	W18-012-194	B3FM46	N/A	624418	YES	Intact
12/07/17	09:00:00	W18-012-194	B3FM47	N/A	624419	YES	Intact
12/07/17	09:00:00	F18-003-002	B3FXN1	N/A	624420	YES	Intact
12/07/17	09:00:00	F18-003-005	B3FXN4	N/A	624421	YES	Intact
12/07/17	09:00:00	F18-003-008	B3FXN7	N/A	624422	YES	Intact

SAMPLE LOG-IN SHEET

Lab Name Southwest Research Institute		Page 1 of 1	
Received By (Print Name) DAVID GARCIA		Log-in Date 12/07/2017	
Received By (Signature) <i>David Garcia</i>			
Case Number CHPRC	Sample Delivery Group No. N/A		SAS Number N/A
Remarks: 20859.01.00X		Remarks: Condition of Sample Shipment, etc	
	EPA Sample #	Sample Tag #	Assigned Lab #
1. Custody Seal(s)	<input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent* <input checked="" type="checkbox"/> Intact / <input type="checkbox"/> Broken	B3FK91	N/A
		B3FM45	N/A
2. Custody Seal Nos.	N/A	B3FM46	N/A
		B3FM47	N/A
3. Chain-of Custody Records	<input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent*	B3FXN1	N/A
4. Traffic Reports or Packing Lists	<input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent*	B3FXN4	N/A
5. Airbill	Airbill/Sticker <input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent*	B3FXN7	N/A
6. Airbill No.	770918624602, 770923245182		
7. Sample Tags	<input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent		
Sample Tag Numbers	Listed / <input checked="" type="checkbox"/> Not listed on Chain of Custody		
8. Sample Condition	<input checked="" type="checkbox"/> Intact / <input type="checkbox"/> Broken* / <input type="checkbox"/> Leaking		
9. Cooler Temperature	NOTEC		
10. Does Information on custody records, traffic reports, and sample tags agree?	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No*		
11. Date Received at Lab	12/07/2017		
12. Time Received	09:00:00		
Sample Transfer			
Fraction Inorg	Fraction		
Area # 12.13	Area #		
By DAVID GARCIA	By		
On 12/07/2017	On		

* Contact SMO and attach record of resolution

Reviewed By <i>David Garcia</i>	Logbook No. Sample Receipt (60847)
Date 12.7.17	Logbook Page No. 10027 Sec 2014

010009

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 171207-6
SwRI SRR: 60847
SDG: 624416
CASE: W18-012
VTSR: 12-07-2017

SW-846 Method 9012 & 9014

pH Report

SwRI

pH Preservation Report

Sample Receipt: 60847

Customer: CH2M Hill Plateau Remediation

Project: 20859.01.00X

Case: CHPRC

Received: 12/07/2017

Samples Logged in by: DXGARCIA

SwRI #	Customer ID	Container ID	Initial pH	Login			Lab				
				Adjustment	Final pH	Paper Lot	Adjustment	Final pH	Paper lot	Adjusted	Lab Staff ID
624416 1	B3FK91		>=12								
624417 1	B3FM45		>=12								
624418 1	B3FM46		>=12								
624419 1	B3FM47		>=12								
624420 1	B3FXN1										
624421 1	B3FXN4										
624422 1	B3FXN7										

010011

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 171207-6
SwRI SRR: 60847
SDG: 624416
CASE: W18-012
VTSR: 12-07-2017

SW-846 Method 9012 & 9014

Case Narrative

010012

CLIENT: CH2M Hill Plateau Remediation Company**SDG: 624416****SwRI Project Number: 20859.01.00X****SwRI Sample Receipt Number: 60847****Page#: 1**

SwRI CASE NARRATIVE

1. Four (04) samples were received for Various Cyanide Analyses:

SwRI ID	Customer ID	Matrix
624416	B3FK91	Water
624417	B3FM45	Water
624418	B3FM46	Water
624419	B3FM47	Water

Client: CH2M Hill Plateau Remediation Company
SDG: 624416
SwRI Project Number: 20859.01.00X
SwRI Task Order Number(s): 171207-6

WETCHEM ANALYSIS

The following analyses were performed for this sample delivery group (SDG):

- Total Cyanide – SW-846 Method 9012
- Amenable Cyanide – SW-846 Method 9012
- Free Cyanide – SW-846 Method 9014

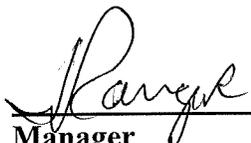
Holding Times:

All holding times were met.

Cyanide:

All PBs, ICB's and CCB's were less than the reporting limit. All LCSWs were within 80-120% recovery and all ICV's and CCV's were within 90-110% recovery. The method states 90-110% recovery criteria for LCSH and LCSL; all were within their specified criteria. All LLCs were within 50-150% recovery and all duplicates were less than 20% recovery. If the method did not specify MS recovery criteria, then 75-125% was used. All matrix spike recoveries were within their specified criteria with the exception of free cyanide with 4.0% recovery (SwRI#624416), which can be due to the sample containing one or more of the metals that form the metal cyanide complex.

“I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package and in the electronic data deliverable submitted has been authorized by the laboratory manager or his/her designee, as verified by the following signature. This report shall not be reproduced except in full without the written approval of SwRI.”



Manager

12/27/17

Date

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 171207-6
SwRI SRR: 60847
SDG: 624416
CASE: W18-012
VTSR: 12-07-2017

SW-846 Method 9012 & 9014 Analyses

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 171207-6
SwRI SRR: 60847
SDG: 624416
CASE: W18-012
VTSR: 12-07-2017

SW-846 Method 9012 & 9014 Results

SOUTHWEST RESEARCH INSTITUTE
WetChem Report
Cover Page

010016

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6

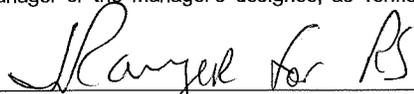
SDG: 624416
SRR: 60847

Case: CHPRC
Project: 20859.01.00X

Client Sample ID	Lab Sample ID
B3FK91	624416
B3FK91D	624416D
B3FM45	624417
B3FM46	624418
B3FM47	624419

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: 
Date: 12/27/17

Name: Radonna Spies
Title: Principal Scientist

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010017 Client Sample ID

B3FK91

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: 624416
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: 12/07/2017
Collection Date: 12/06/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00778		KNO	0.00500	1	20171218-P001	12/18/2017 16:19
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 15:45
57-12-5	Total Cyanide	0.00778		KNO	0.00500	1	20171218-P001	12/18/2017 15:20

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010018 Client Sample ID

B3FM45

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: 624417
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: 12/07/2017
Collection Date: 12/06/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00687		KNO	0.00500	1	20171218-P001	12/18/2017 16:52
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 14:38
57-12-5	Total Cyanide	0.00687		KNO	0.00500	1	20171218-P001	12/18/2017 15:20

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010019 Client Sample ID

B3FM46

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: 624418
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: 12/07/2017
Collection Date: 12/06/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:52
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 14:38
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 15:20

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010020 Client Sample ID

B3FM47

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: 624419
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: 12/07/2017
Collection Date: 12/06/2017

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:52
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	12/19/2017 14:39
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 15:50

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form I

010021

SwRI ID

PB17M18PB1

Certificate of Analysis

Type: Blank

Client: CH2M Hill Plateau Remediation Company

SDG: 624416

Case: CHPRC

Task Order: 171207-6

SRR: 60847

Project: 20859.01.00X

Lab ID: PB17M18PB1

Matrix: Water

Receipt Date: NA

Result Units: mg/L

% Solids: NA

Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 15:20

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010022

SwRI ID

PB17M18-C2

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: PB17M18-C2
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: NA
Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:52

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010023

SwRI ID

PB17M18PB2

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: PB17M18PB2
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: NA
Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	KNO	0.00500	1	20171218-P001	12/18/2017 16:19

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

12/28/2017

REV.0

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form I
Certificate of Analysis

010024

SwRI ID

CN-ICB

Type: ICB/Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: CN-ICB
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X
Receipt Date: NA
Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Free Cyanide	0.00500	U	KNO	0.00500	1	NA	12/19/2017 14:38

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	RL - SwRI Reporting Limit	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	DF - Dilution Factor	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	M - Instrument	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences		NA - Not Applicable
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

SOUTHWEST RESEARCH INSTITUTE 010025
WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Result Units: mg/L
Associated Analytical Batches: 20171219-A001

SDG: 624416
SRR: 60847
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: CHPRC
Project: 20859.01.00X

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Total Cyanide	0.581	0.617	106.2%	90%-110%	0.581	0.614	105.7%	0.611	105.2%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010026
WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Result Units: mg/L
Associated Analytical Batches: 20171219-A001

SDG: 624416
SRR: 60847
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: CHPRC
Project: 20859.01.00X

Continuing Calibration Verification											
Analyte	True	Found3	%Rec	Found4	%Rec	Found5	%Rec	Found6	%Rec	Limit	M
Total Cyanide	0.581	0.610	105.0%	0.602	103.6%	0.594	102.2%	0.636	109.5%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010027
WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Result Units: mg/L
Associated Analytical Batches: 20171219-A001

SDG: 624416
SRR: 60847
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: CHPRC
Project: 20859.01.00X

Continuing Calibration Verification					
Analyte	True	Found7	%Rec	Limit	M
Total Cyanide	0.581	0.601	103.4%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010028
WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Result Units: mg/L
Associated Analytical Batches: 20171219-A003

SDG: 624416
SRR: 60847
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: CHPRC
Project: 20859.01.00X

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Free Cyanide	0.581	0.604	104.0%	90%-110%	0.581	0.590	101.6%	0.606	104.3%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010029
 WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 171207-6
 Result Units: mg/L
 Associated Analytical Batches: 20171219-A003

SDG: 624416
 SRR: 60847
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: CHPRC
 Project: 20859.01.00X

Continuing Calibration Verification					
Analyte	True	Found3	%Rec	Limit	M
Free Cyanide	0.581	0.637	109.6%	90%-110%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010030

WetChem Report - Form IIB

Low Level Check Standard

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Result Units: mg/L
Associated Analytical Batch: 20171219-A001

SDG: 624416
SRR: 60847

Case: CHPRC
Project: 20859.01.00X

LLC Standards					
Analyte	True	Found1	%Rec	Limit	M
Total Cyanide	0.00500	0.00465	93.0%	50%-150%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIB-IN

SOUTHWEST RESEARCH INSTITUTE 010031
WetChem Report - Form IIB
Low Level Check Standard

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Result Units: mg/L
Associated Analytical Batch: 20171219-A003

SDG: 624416
SRR: 60847

Case: CHPRC
Project: 20859.01.00X

LLC Standards					
Analyte	True	Found1	%Rec	Limit	M
Free Cyanide	0.00500	0.00541	108.2%	50%-150%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form IIB-IN

SOUTHWEST RESEARCH INSTITUTE 010032
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624416
SRR: 60847
Preparation Blank Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A001

Analyte	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank										M
	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	Found3	Qual	Found4	Qual	Found5	Qual	
Total Cyanide	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE 010033
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624416
SRR: 60847
Preparation Blank Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A001

Continuing Calibration Blank					
Analyte	Found6	Qual	Found7	Qual	M
Total Cyanide	0.00500	U	0.00500	U	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE 010034
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624416
SRR: 60847
Preparation Blank Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A002

Analyte	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank		M
	Result	Qual	Found	Qual	Found1	Qual	
Amenable Cyanide	0.00500 0.00500	U U	-	-	-	-	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE 010035
WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 624416
SRR: 60847
Preparation Blank Matrix: Water
Associated Prep Batches: 20171215-P001

Case: CHPRC
Project: 20859.01.00X
Associated Analytical Batches: 20171219-A003

Analyte	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank						M
	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	Found3	Qual	
Free Cyanide	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	KNO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VA

010036 Client Sample ID

B3FK91MS/MSD

Matrix Spike/Matrix Spike Duplicate Sample Recovery

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: 624416S-R
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	MS Result	MS Spike Added	MS %Rec	MSD Result	MSD Spike Added	MSD %Rec	%RPD	Control Limit %Rec	Control Limit %RPD	M	Note
Total Cyanide	0.00778		0.0580	0.0500	100.4%	-	-	-	-	75%-125%	-	KNO	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	M - Instrument	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	MS - Matrix Spike	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences	Q - Qualifier	NA - Not Applicable
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VB

010037 Client Sample ID

B3FK91AS

Post-Digestion Spike Sample Recovery

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: 624416AS-F
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.006

Analyte	Parent Sample Result	Qual	Spiked Sample Result	Qual	Spike Added	%Rec.	Control Limit	M	Q	DF	Prep Batch	Analysis Date/Time	Note
Amenable Cyanide	-		-		-	-	-	NA		-		-	
Free Cyanide	0.00500	UX	0.00991	X	0.250	4.0%	80%-120%	KNO	X	1	NA	12/19/2017 15:45	
Total Cyanide	-		-		-	-	-	NA		-		-	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL)	M - Instrument	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	MS - Matrix Spike	KNO - Konelab/Amenable Cyanide
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	KNO - Konelab/Cyanide 9014
E - Result is estimated due to interferences	Q - Qualifier	NA - Not Applicable
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

Form VB-IN

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VI

010038 Client Sample ID

B3FK91D

Duplicates

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: 624416D-F
Result Units:

SDG: 624416
SRR: 60847
Matrix: Water
% Solids: NA

Case: CHPRC
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	Duplicate Result	Qual	RPD	RPD Limit	Control Limit	M	Note
Amenable Cyanide	0.00778		0.00734		5.82%	-	-	KNO	
Free Cyanide	0.00500	UX	0.00500	UX	0.00%	20%	-	KNO	#
Total Cyanide	0.00778		0.00734		5.82%	20%	0.00500	KNO	

indicates that both the parent and duplicate sample results are below the RL, therefore no RPD limit or control limit is applicable.

Data Reporting Qualifiers (Qual)	Columns	Instruments/Method (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	M - Instrument RPD - Relative Percent Difference	KNO - Konelab/Cyanide 9012 KNO - Konelab/Amenable Cyanide KNO - Konelab/Cyanide 9014 NA - Not Applicable

Form VI-IN

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VII
Laboratory Control Sample

010039 SwRI ID
LCS17M18CS1

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: LCS17M18CS1
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
LCS Source: ERA

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.581	0.601	D	103.4%	85%-115%	KNO	12/18/2017 15:20

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VII
Laboratory Control Sample

010040

SwRI ID

LCS17M18CS2

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: LCS17M18CS2
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.500	0.479		95.8%	90%-110%	KNO	12/18/2017 15:20

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VII
Laboratory Control Sample

010041

SwRI ID

LCS17M18CS3

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: LCS17M18CS3
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
Associated Prep Batches: 20171218-P001

Case: CHPRC
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.0500	0.0514		102.8%	90%-110%	KNO	12/18/2017 15:20

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form VII
Laboratory Control Sample

010042

SwRI ID

CN-ICV

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Lab ID: CN-ICV
Result Units: mg/L

SDG: 624416
SRR: 60847
Matrix: Water
Associated Prep Batches: 20171215-P001

Case: CHPRC
Project: 20859.01.00X
LCS Source: ERA

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Free Cyanide	0.581	0.604	D	104.0%	85%-115%	KNO	12/19/2017 14:38

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
KNO - Konelab/Amenable Cyanide
KNO - Konelab/Cyanide 9014
NA - Not Applicable

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE 010043
WetChem Report - Form IX

Detection Limits

Client: CH2M Hill Plateau Remediation Company
Task Order: 171207-6
Result Units: mg/L

SDG: 624416
SRR: 60847
Instrument: Konelab

Case: CHPRC
Project: 20859.01.00X
Date: 01/09/2014

Analyte	Wavelength	RL
Amenable Cyanide	575 nm	0.00500
Free Cyanide	575 nm	0.00500
Total Cyanide	575 nm	0.00500

Columns
RL - SwRI Reporting Limit