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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

NELAP ACCREDITED TNI LABORATORY

NSF Registered to ISO 9001

July 25, 2018

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

Attn: Ms. Karen Waters-Husted

Subject:	SAF No:	W18-006
	SDG Number:	633800
	SwRI Project Number:	20859.01.00X
	SwRI Task Order Number:	180627-3
	SwRI Sample Receipt Number:	61888
	Samples Received	06.27.18
	Fraction:	Cyanide Analyses

Dear Ms. Waters-Husted:

Please find the enclosed results for the eighteen (18) overall water samples received on the above referenced date. If you should have any questions, please do not hesitate to contact me at (210) 522-3242, or at radonna.spies@swri.org.

Sincerely,

Radonna Spies
Principal Scientist

APPROVED:

Michael J. Dammann
Director

RPS: aa
Encl

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
TASK ORDER(s): 180627-3
SRR: 61888
SDG: 633800
VTSR: 06.27.18
PROJECT#: 20859.01.00X

NARRATIVE

CLIENT: CH2M Hill Plateau Remediation Company
SDG: 633800
SwRI Project Number: 20859.01.00X
SwRI Sample Receipt Number: 61888
Page#: 1

SwRI CASE NARRATIVE

1. Eighteen (18) samples were received for Cyanide Analyses by SW846 Method 9012 and SW846 Method 9014:

SwRI ID	Customer ID	Matrix
633800	B3JCT2	Water
633801	B3JCT6	Water
633802	B3JCV1	Water
633803	B3JCV5	Water
633804	B3JDB0	Water
633805	B3JDB1	Water
633806	B3JDB2	Water
633807	B3JDB3	Water
633808	B3JDC1	Water
633809	B3JDC2	Water
633810	B3JFD7	Water
633811	B3JFD8	Water
633812	B3JFH4	Water
633813	B3JFH5	Water
633814	B3JFK1	Water
633815	B3JFK2	Water
633834	B3JFK3	Water
633835	B3JFK4	Water

Client: CH2M Hill Plateau Remediation Company
SDG: 633800
SwRI Project Number: 20859.01.00X
SwRI Task Order Number(s): 180627-3

WETCHEM ANALYSIS

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

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

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 85-115% 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%. If the method did not specify MS recovery criteria, then 75-125% was used. All matrix spike recoveries were within their specified criteria. Post-Digestion MS state a recovery criteria of 80-120%, all post-digestion matrix spike recoveries were within their specified criteria with the exception of sample SwRI#633800 for free cyanide with a 79.0% recovery. All associated samples were flagged with an "X". Free cyanide samples SwRI#633804 & 633805 were more negative than the reporting limit and were therefore titrated to verify sample normality. Both samples were pH adjusted with 10N NaOH as before in order to matrix match 0.25N NaOH and re-analyzed. Samples were consistent with initial values analyzed and were therefore accepted and reported as non-detects.

"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."

DAPrus
Principal Scientist

7/23/18
Date

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
TASK ORDER(s): 180627-3
SRR: 61888
SDG: 633800
VTSR: 06.27.18
PROJECT#: 20859.01.00X

SAMPLE RECEIPT, TASK ORDER & CHAIN OF CUSTODY

Sample Receipt

Southwest Research Institute

Sample Receipt Number: 61888

VTSR: 06/27/18

Time: 08:20:00

Project: 20859.01.00X
Case #: W18-006
Client: CH2M Hill Plateau Remediation Company

Manager: SPIES, RADONNA
Logged in by: DXGARCIA
Creation Date: 06/27/18

Notes

Samples were received intact.

Fed Ex Tracking #:
7725 5581 1784 _ 1.5°C (wet ice)
7725 7210 1960 _ 1.1°C (wet ice)

pH Test Paper 0.0 - 13.0
Lot - 230016, CI 83485
Exp: 10/30/2019

Ice Chest No.:
GWS-400
GWS-714

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

Test requirements located on the applicable Task Order.

Backaround CPM: <120cpm
Container Wipe CPM: <120cpm
Total CPM: <120

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
633800	B3JCT2	06/22/18	Water	1	
633801	B3JCT6	06/22/18	Water	1	
633802	B3JCV1	06/22/18	Water	1	
633803	B3JCV5	06/22/18	Water	1	
633804	B3JDB0	06/22/18	Water	1	
633805	B3JDB1	06/22/18	Water	1	
633806	B3JDB2	06/22/18	Water	1	
633807	B3JDB3	06/22/18	Water	1	
633808	B3JDC1	06/22/18	Water	1	
633809	B3JDC2	06/22/18	Water	1	
633810	B3JFD7	06/22/18	Water	1	
633811	B3JFD8	06/22/18	Water	1	
633812	B3JFH4	06/22/18	Water	1	
633813	B3JFH5	06/22/18	Water	1	
633814	B3JFK1	06/26/18	Water	1	
633815	B3JFK2	06/26/18	Water	1	
633834	B3JFK3	06/26/18	Water	1	
633835	B3JFK4	06/26/18	Water	1	

Containers: 18 **Samples: 18**

These documents are associated with this receipt: 246045[COC for SRR 61888], 246046[Paperwork for SRR 61888]

Thermometer: 021056
Temperature: NOTE

61888 CH2M Hill Plateau Remediatio

Southwest Research Institute

Laboratory Task Order

TO #: 180627-3 Revision: 0

Project(s): 20859.01.00X
Manager(s): SPIES, RADONNA
To Client: 07/24/18

SDG: 633800
VTSR: 06/27/18
SAF: W18-006

SRR #'s: 61888
Client(s): CH2M Hill Plateau Remediation Company

Instructions

CH2MHill Plateau Remediation Company. 300071
SAF No. W18-006

SDG 633800 is closed

30-day TAT.
FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 07/25/2018.

18 overall samples (18 containers) were received on 06/27/2018, which are ALL listed here.

NOTE _ Sample B3JFD7 / 633810 and B3JFD8 / 633811 only require Total Cn.

DELIVERY NOTE _ Due to a delay with FED EX, all the samples under Cooler GWS-400 (7725 5581 1784) were delivered to SwRI on 06/27/18, instead of the requested date of 06/26/18.

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

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

Documents Related to this task order: 246045[COC for SRR 61888], 246046[Paperwork for SRR 61888]

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

Test: AMENCN_9012
Section: WETCHEM

Holding: 14 days from CED

Amenable Cyanide by SW846 9012 Cnt: 16

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
633800		1	Water	B3JCT2	22 Jun 18	06 Jul 18
633801		1	Water	B3JCT6	22 Jun 18	06 Jul 18
633802		1	Water	B3JCV1	22 Jun 18	06 Jul 18
633803		1	Water	B3JCV5	22 Jun 18	06 Jul 18
633804		1	Water	B3JDB0	22 Jun 18	06 Jul 18
633805		1	Water	B3JDB1	22 Jun 18	06 Jul 18
633806		1	Water	B3JDB2	22 Jun 18	06 Jul 18
633807		1	Water	B3JDB3	22 Jun 18	06 Jul 18
633808		1	Water	B3JDC1	22 Jun 18	06 Jul 18
633809		1	Water	B3JDC2	22 Jun 18	06 Jul 18
633812		1	Water	B3JFH4	22 Jun 18	06 Jul 18
633813		1	Water	B3JFH5	22 Jun 18	06 Jul 18
633814		1	Water	B3JFK1	26 Jun 18	10 Jul 18
633815		1	Water	B3JFK2	26 Jun 18	10 Jul 18
633834		1	Water	B3JFK3	26 Jun 18	10 Jul 18
633835		1	Water	B3JFK4	26 Jun 18	10 Jul 18

Southwest Research Institute

Laboratory Task Order

TO #: 180627-3 Revision: 0

Project(s): 20859.01.00X
Manager(s): SPIES, RADONNA
To Client: 07/24/18

SDG: 633800
VTSR: 06/27/18
SAF: W18-006

SRR #'s: 61888
Client(s): CH2M Hill Plateau Remediation Company

Test: CN_9012
Section: WETCHEM

Holding: 14 days from CED

Cyanide by Method 9012 (Automated)

Cnt: 18

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
633800		1	Water	B3JCT2	22 Jun 18	06 Jul 18
633801		1	Water	B3JCT6	22 Jun 18	06 Jul 18
633802		1	Water	B3JCV1	22 Jun 18	06 Jul 18
633803		1	Water	B3JCV5	22 Jun 18	06 Jul 18
633804		1	Water	B3JDB0	22 Jun 18	06 Jul 18
633805		1	Water	B3JDB1	22 Jun 18	06 Jul 18
633806		1	Water	B3JDB2	22 Jun 18	06 Jul 18
633807		1	Water	B3JDB3	22 Jun 18	06 Jul 18
633808		1	Water	B3JDC1	22 Jun 18	06 Jul 18
633809		1	Water	B3JDC2	22 Jun 18	06 Jul 18
633810		1	Water	B3JFD7	22 Jun 18	06 Jul 18
633811		1	Water	B3JFD8	22 Jun 18	06 Jul 18
633812		1	Water	B3JFH4	22 Jun 18	06 Jul 18
633813		1	Water	B3JFH5	22 Jun 18	06 Jul 18
633814		1	Water	B3JFK1	26 Jun 18	10 Jul 18
633815		1	Water	B3JFK2	26 Jun 18	10 Jul 18
633834		1	Water	B3JFK3	26 Jun 18	10 Jul 18
633835		1	Water	B3JFK4	26 Jun 18	10 Jul 18

Test: CN_9014
Section: WETCHEM

Holding: 14 days from CED

FREE Cyanide by SW846 9014

Cnt: 16

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
633800		1	Water	B3JCT2	22 Jun 18	06 Jul 18
633801		1	Water	B3JCT6	22 Jun 18	06 Jul 18
633802		1	Water	B3JCV1	22 Jun 18	06 Jul 18
633803		1	Water	B3JCV5	22 Jun 18	06 Jul 18
633804		1	Water	B3JDB0	22 Jun 18	06 Jul 18
633805		1	Water	B3JDB1	22 Jun 18	06 Jul 18
633806		1	Water	B3JDB2	22 Jun 18	06 Jul 18
633807		1	Water	B3JDB3	22 Jun 18	06 Jul 18
633808		1	Water	B3JDC1	22 Jun 18	06 Jul 18
633809		1	Water	B3JDC2	22 Jun 18	06 Jul 18
633812		1	Water	B3JFH4	22 Jun 18	06 Jul 18
633813		1	Water	B3JFH5	22 Jun 18	06 Jul 18
633814		1	Water	B3JFK1	26 Jun 18	10 Jul 18
633815		1	Water	B3JFK2	26 Jun 18	10 Jul 18
633834		1	Water	B3JFK3	26 Jun 18	10 Jul 18
633835		1	Water	B3JFK4	26 Jun 18	10 Jul 18

010008

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-045 Page 1 of 1

Collector:	Malcom Chunn CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	W18-006	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	RCRA, June 2018	Logbook No.:	HNF-N-506 100	Ice Chest No.:	GWS-400
Shipped To (Lab):	Southwest Research Institute	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	772555811784
Protocol	RCRA	Priority:	30 Days	Offsite Property No.:	9610

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
B3JCT2	N	W	JUN 22 2018	1316	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JCT6	Y	W	↓	↓	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888

SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

Relinquished By:	Received By:
Malcom Chunn CHPRC — MRC — JUN 22 2018 1400 (Print First and Last Name / Signature / Date/Time)	SSU-1 — JUN 22 2018 1400 (Print First and Last Name / Signature / Date/Time)
SSU-1 — JUN 25 2018 0820 (Print First and Last Name / Signature / Date/Time)	Janelle Zunker CHPRC — JUN 25 2018 0820 (Print First and Last Name / Signature / Date/Time)
Janelle Zunker CHPRC — JUN 25 2018 1400 (Print First and Last Name / Signature / Date/Time)	FEDEX (Print First and Last Name / Signature / Date/Time)
FED EX (Print First and Last Name / Signature / Date/Time)	David Garcia — 06/27/2018 08:20 (Print First and Last Name / Signature / 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

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

Printed On 4/11/2018 FSR ID = FSR60339 A-6004-842 (REV 3)

010009

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-047 Page 1 of ~~1~~ 2

Collector:	Malcom Chunn CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650 926-25-18
SAF No.:	W18-006	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	RCRA, June 2018	Logbook No.:	HNF-N-506 100	Ice Chest No.:	GWS-400
Shipped To (Lab):	Southwest Research Institute	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	7725558117841
Protocol	RCRA	Priority:	30 Days	Offsite Property No.:	9610

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
B3JCV1	N	W	JUN 22 2018	1045	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JCV5	Y	W	↓	↓	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888
SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

Relinquished By (Print First and Last Name)	Signature	Date/Time	Received By (Print First and Last Name)	Signature	Date/Time
Malcom Chunn CHPRC	MRC	JUN 22 2018 1155	Daniel Klug CHPRC	D Klug	JUN 22 2018 1155
Daniel Klug CHPRC	D Klug	JUN 22 2018 1225	SSU-1		JUN 22 2018 1225
SSU-1		JUN 25 2018 0820	Janelle Zunker CHPRC	J Zunker	JUN 25 2018 0820
Janelle Zunker CHPRC	J Zunker	JUN 25 2018 1400	FEDEX		

Matrix *
S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Oil, A = Air
DS = Drum Solids, DL = Drum Liquid, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other

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

Printed On 4/11/2018 FSR ID = FSR60341 A-6004-842 (REV 3)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. W018-006047

Page 2 of 2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
		FED EX		David Garcia	David Garcia		06/27/2018 08:20
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

A-6003-962 (03/05)

010011

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-060 Page 1 of 1

Collector:	CHRIS FULTON CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	W18-006	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	RCRA, June 2018	Logbook No.:	HNF-N-506-97-95	Ice Chest No.:	GW5-400
Shipped To (Lab):	Southwest Research Institute	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	772555811784
Protocol	RCRA	Priority:	30 Days	Offsite Property No.:	9610

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
B3JDB0	N	W	6-22-18	0954	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JDB2	Y	W	6-22-18	0954	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888
SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

Relinquished By	Print First and Last Name	Signature	Date/Time	Received By	Print First and Last Name	Signature	Date/Time
	CHRIS FULTON CHPRC		JUN 22 2018 1250		SSU-1		JUN 22 2018 1250
	SSU-1		JUN 25 2018 0820		Janelle Zunker CHPRC		JUN 25 2018 0820
	Janelle Zunker CHPRC		JUN 25 2018 1400		FEDEX		
	FED EX				David Garcia		06/26/2018 08:20

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

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

Printed On 4/11/2018 FSR ID = FSR60573 A-6004-842 (REV 3)

CH2MHill Plateau Remediation Company	62 lbs	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	010012 C.O.C. # W18-006-061 Page 1 of 1

Collector: CHRIS FULTON CHPRC	**Contact/Requester:** Karen Waters-Husted	**Telephone No.:** 509-376-4650
SAF No.: W18-006	**Sampling Origin:** Hanford Site	**Purchase Order/Charge Code:** 300071
Project Title: RCRA, June 2018	**Logbook No.:** HNF-N-506 97-95	**Ice Chest No.:** GWS-480
Shipped To (Lab): Southwest Research Institute	**Method of Shipment** Commercial Carrier	**Bill of Lading/Air Bill No.:** 7725581784
Protocol RCRA	**Priority:** 30 Days	**Offsite Property No.:** 9610

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
B3JDB3	Y	W	6-22-18	0954	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JDB1	N	W	6-22-18	0954	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888

SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

Relinquished By	Print First and Last Name	Signature	Date/Time	Received By	Print First and Last Name	Signature	Date/Time
	CHRIS FULTON CHPRC		JUN 22 2018 1250		SSU-1		JUN 22 2018 1250
	SSU-1		JUN 25 2018 0820		Janelle Zunker CHPRC		JUN 25 2018 0820
	Janelle Zunker CHPRC		JUN 25 2018 1400		FEDEX		
	FEDEX				David Garcia		06/27/2018 08:20

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

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

Printed On 4/11/2018 FSR ID = FSR60573 A-6004-842 (REV 3)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	0100163 C.O.C. # W18-006-064 Page 1 of 1

Collector:	CHRIS FULTON CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	W18-006	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	RCRA, June 2018	Logbook No.:	HNF-N-506 9795	Ice Chest No.:	GWS-400
Shipped To (Lab):	Southwest Research Institute	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	772555811784
Protocol	RCRA	Priority:	30 Days	Offsite Property No.:	9610

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
B3JDC1	N	W	6-22-18	1225	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JDC2	Y	W	6-22-18	1225	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888
SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

SwRI

Relinquished By:	Received By:
CHRIS FULTON CHPRC — JUN 22 2018 1250	SSU-1 — JUN 22 2018 1250
SSU-1 — JUN 25 2018 0820	Janelle Zunker CHPRC — JUN 25 2018 0820
Janelle Zunker CHPRC — JUN 25 2018 1400	FEDEX
FED EX	Jesus Garcia — 06/27/2018 08:20

Print First and Last Name / Signature / Date/Time

Matrix *
S = Soil; SE = Sediment; SO = Solid; SL = Sludge; W = Water; O = Oil; A = Air; DS = Drum Solids; DL = Drum Liquid; T = Tissue; WI = Wipe; L = Liquid; V = Vegetation; X = Other

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

Printed On 4/11/2018 FSR ID = FSR60576 A-6004-842 (REV 3)

010014

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-161 Page 1 of 12

Collector:	Malcom Chunn CHPRC	**Contact/Requester:**	Karen Waters-Husted	**Telephone No.:**	509-376-4650 V-2578
SAF No.:	W18-006	**Sampling Origin:**	Hanford Site	**Purchase Order/Charge Code:**	300071
Project Title:	RCRA, June 2018	**Logbook No.:**	HNF-N-506 100	**Ice Chest No.:**	GWS-400
Shipped To (Lab):	Southwest Research Institute	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.:**	772555811784
Protocol	RCRA	**Priority:**	30 Days	**Offsite Property No.:**	9610

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
B3JFD7	N	W	JUN 22 2018	0710	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888

SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

Relinquished By	Print First and Last Name	Signature	Date/Time	Received By	Print First and Last Name	Signature	Date/Time
Malcom Chunn CHPRC	MR Chunn	MR Chunn	JUN 22 2018 0910	Daniel Klug CHPRC	D. Klug	D. Klug	JUN 22 2018 0910
Daniel Klug CHPRC	D. Klug	D. Klug	JUN 22 2018 0930	SSU-1	SSU-1	SSU-1	JUN 22 2018 0930
SSU-1	SSU-1	SSU-1	JUN 25 2018 0820	Janelle Zunker CHPRC	J. Zunker	J. Zunker	JUN 25 2018 0820
Janelle Zunker CHPRC	J. Zunker	J. Zunker	JUN 25 2018 1400	FEDEX	David Garcia	David Garcia	06/27/2018 0820

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

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

Printed On 4/11/2018 FSR ID = FSR60562 A-6004-842 (REV 3)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. W18-0016-1161

Page 2 of 2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	FED EX			David Garcia	David Garcia		06/27/2018 08:20
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

A-6003-962 (03/05)

010016

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-163 Page 1 of 1/2

Collector: Malcom Chunn CHPRC	**Contact/Requester:** Karen Waters-Husted	**Telephone No.:** 509-376-4650 rz 6-25-18
SAF No.: W18-006	**Sampling Origin:** Hanford Site	**Purchase Order/Charge Code:** 300071
Project Title: RCRA, June 2018	**Logbook No.:** HNF-N-506 100	**Ice Chest No.:** GWS-400
Shipped To (Lab): Southwest Research Institute	**Method of Shipment** Commercial Carrier	**Bill of Lading/Air Bill No.:** 772 5 558 11784
Protocol RCRA	**Priority:** 30 Days	**Offsite Property No.:** 9610

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
B3JFD8	N	W	JUN 22 2018	0826	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888

SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

SwRI

Relinquished By:	Received By:
Malcom Chunn CHPRC — Print First and Last Name; Signature; JUN 22 2018 0910 — Date/Time	Daniel Klug CHPRC — Print First and Last Name; Signature; JUN 22 2018 0910 — Date/Time
Daniel Klug CHPRC — Print First and Last Name; Signature; JUN 22 2018 0930 — Date/Time	SSU-1 — Print First and Last Name; Signature; JUN 22 2018 0930 — Date/Time
SSU-1 — Print First and Last Name; Signature; JUN 25 2018 0820 — Date/Time	Janelle Zunker CHPRC — Print First and Last Name; Signature; JUN 25 2018 0820 — Date/Time
Janelle Zunker CHPRC — Print First and Last Name; Signature; JUN 25 2018 1400 — Date/Time	FEDEX — Print First and Last Name; Signature; 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

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

Printed On 4/11/2018 FSR ID = FSR60563 A-6004-842 (REV 3)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. W18-006-163

Page 2 of 2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	FED EX						
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
							06/27/2018 08:20
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

A-6003-962 (03/05)

010018

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-178 Page 1 of 1

Collector: Malcom Chunn CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650 926-25-18
SAF No.: W18-006	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, June 2018	Logbook No.: HNF-N-506 100	Ice Chest No.: GWS-400
Shipped To (Lab): Southwest Research Institute	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.: 772555811784
Protocol RCRA	Priority: 30 Days	Offsite Property No.: 9610

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
B3JFH5	Y	W	JUN 22 2018	1145	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JFH4	N	W	↓	↓	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888
SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

SwRI

Relinquished By:	Received By:
Malcom Chunn CHPRC — M R C — JUN 22 2018 1155	Daniel Klug CHPRC — D. Klug — JUN 22 2018 1155
Daniel Klug CHPRC — D. Klug — JUN 22 2018 1225	SSU-1 — JUN 22 2018 1225
SSU-1 — JUN 25 2018 0820	Janelle Zunker CHPRC — JUN 25 2018 0820
Janelle Zunker CHPRC — JUN 25 2018 1400	FEDEX

Matrix *
S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Oil, A = Air, DS = Drum Solids, DL = Drum Liquid, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other

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

Printed On 4/19/2018 FSR ID = FSR60751 A-6004-842 (REV 3)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. W18-006-178

Page 2 of 2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	FED EX				David Garcia	David Garcia	06/27/2018 08:20
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

A-6003-962 (03/05)

010020

CH2MHill Plateau Remediation Company	21 lbs CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-180 Page 1 of 1

Collector:	Mike Esparza /CHPRC	Contact/Requester:	Karen Waters-Husted	Telephone No.:	509-376-4650
SAF No.:	W18-006	Sampling Origin:	Hanford Site	Purchase Order/Charge Code:	300071
Project Title:	RCRA, June 2018	Logbook No.:	HNF-N-506-95/63	Ice Chest No.:	GWS-714
Shipped To (Lab):	Southwest Research Institute	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.:	7725 7210 1960
Protocol	RCRA	Priority:	30 Days	Offsite Property No.:	9621

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
B3JFK2	Y	W	JUN 26 2018	0920	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JFK1	N	W	JUN 26 2018	0920	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888

SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

SwRI

Relinquished By: Mike Esparza /CHPRC	JUN 26 2018 1000	Received By: Jeff Lucas /CHPRC	JUN 26 2018 1000	Matrix *	
Print First and Last Name / Signature / Date/Time		Print First and Last Name / Signature / Date/Time		S = Soil	DS = Drum Solids
Relinquished By: Jeff Lucas /CHPRC	JUN 26 2018 1400	Received By: FEDEX		SE = Sediment	DL = Drum Liquid
Print First and Last Name / Signature / Date/Time		Print First and Last Name / Signature / Date/Time		SO = Solid	T = Tissue
Relinquished By:		Received By:		SL = Sludge	WI = Wipe
Print First and Last Name / Signature / Date/Time		Print First and Last Name / Signature / Date/Time		W = Water	L = Liquid
Relinquished By: FED EX		Received By: David Garcia	06/27/2018 0820	O = Oil	V = Vegetation
Print First and Last Name / Signature / Date/Time		Print First and Last Name / Signature / Date/Time		A = Air	X = Other

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

Printed On 4/11/2018 FSR ID = FSR60344 A-6004-842 (REV 3)

010021

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # W18-006-181 Page 1 of 1

Collector: Mike Esparza /CHPRC	**Contact/Requester:** Karen Waters-Husted	**Telephone No.:** 509-376-4650
SAF No.: W18-006	**Sampling Origin:** Hanford Site	**Purchase Order/Charge Code:** 300071
Project Title: RCRA, June 2018	**Logbook No.:** HNF-N-506 -99/63	**Ice Chest No.:** GWS-714
Shipped To (Lab): Southwest Research Institute	**Method of Shipment** Commercial Carrier	**Bill of Lading/Air Bill No.:** 7725 7210 1960 9621
Protocol RCRA	**Priority:** 30 Days	**Offsite Property No.:**

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
B3JFK4	Y	W	JUN 2 6 2018	0730	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3JFK3	N	W	JUN 2 6 2018	0730	1x500-mL aG	9014_CN (FREE): COMMON; 9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61888

SDG # 633800

SwRI Prjct # 20859.01.00X
TO: 180627-3

Relinquished By:	Received By:
Mike Esparza /CHPRC — JUN 2 6 2018 1000 (Print First and Last Name / Signature / Date/Time)	Jeff Lucas /CHPRC — JUN 2 6 2018 1000 (Print First and Last Name / Signature / Date/Time)
Jeff Lucas /CHPRC — JUN 2 6 2018 1400 (Print First and Last Name / Signature / Date/Time)	FEDEX (Print First and Last Name / Signature / Date/Time)
(Print First and Last Name / Signature / Date/Time)	(EE) 06/27/18 (Print First and Last Name / Signature / Date/Time)
FED EX (Print First and Last Name / Signature / Date/Time)	David Garcia — 06/27/2018 08:20 (Print First and Last Name / Signature / 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

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

Printed On 4/11/2018 FSR ID = FSR60388 A-6004-842 (REV 3)

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: W18-006 / SDG: See T.O.

Sample Receipt: 61888

Airbill: 772555811784,772572101960

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
06/27/18	08:20:00	W18-006-045	B3JCT2	N/A	633800	YES	Intact
06/27/18	08:20:00	W18-006-045	B3JCT6	N/A	633801	YES	Intact
06/27/18	08:20:00	W18-006-047	B3JCV1	N/A	633802	YES	Intact
06/27/18	08:20:00	W18-006-047	B3JCV5	N/A	633803	YES	Intact
06/27/18	08:20:00	W18-006-060	B3JDB0	N/A	633804	YES	Intact
06/27/18	08:20:00	W18-006-061	B3JDB1	N/A	633805	YES	Intact
06/27/18	08:20:00	W18-006-060	B3JDB2	N/A	633806	YES	Intact
06/27/18	08:20:00	W18-006-061	B3JDB3	N/A	633807	YES	Intact
06/27/18	08:20:00	W18-006-064	B3JDC1	N/A	633808	YES	Intact
06/27/18	08:20:00	W18-006-064	B3JDC2	N/A	633809	YES	Intact
06/27/18	08:20:00	W18-006-161	B3JFD7	N/A	633810	YES	Intact
06/27/18	08:20:00	W18-006-163	B3JFD8	N/A	633811	YES	Intact
06/27/18	08:20:00	W18-006-178	B3JFH4	N/A	633812	YES	Intact
06/27/18	08:20:00	W18-006-178	B3JFH5	N/A	633813	YES	Intact
06/27/18	08:20:00	W18-006-180	B3JFK1	N/A	633814	YES	Intact
06/27/18	08:20:00	W18-006-180	B3JFK2	N/A	633815	YES	Intact
06/27/18	08:20:00	W18-006-181	B3JFK3	N/A	633834	YES	Intact
06/27/18	08:20:00	W18-006-181	B3JFK4	N/A	633835	YES	Intact

SAMPLE LOG-IN SHEET

Lab Name: Southwest Research Institute	Page 1 of 1
Received By (Print Name): David Garcia	Log-in Date: 06/27/2018
Received By (Signature): David Garcia	
Case Number: W18-006	Sample Delivery Group No.: N/A
	SAS Number: N/A

Remarks: 20859.01.00X

1.	Custody Seal(s)	Present/Absent* Intact/Broken
2.	Custody Seal Nos.	N/A
3.	Chain-of Custody Records	Present/Absent*
4.	Traffic Reports or Packing Lists	Present/Absent*
5.	Airbill	Airbill/Sticker Present/Absent*
6.	Airbill No.	772555811784,772572101960
7.	Sample Tags	Present/Absent N/A
	Sample Tag Numbers	Listed/Not listed on Chain of Custody
8.	Sample Condition	Intact/Broken*/Leaking
9.	Cooler Temperature	NOTEC
10.	Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*
11.	Date Received at Lab	06/27/2018
12.	Time Received	08:20:00

EPA Sample #	Corresponding: Sample Tag #	Corresponding: Assigned Lab #	Remarks: Condition of Sample Shipment, etc
B3JCT2	N/A	633800	Intact
B3JCT6	N/A	633801	Intact
B3JCV1	N/A	633802	Intact
B3JCV5	N/A	633803	Intact
B3JDB0	N/A	633804	Intact
B3JDB1	N/A	633805	Intact
B3JDB2	N/A	633806	Intact
B3JDB3	N/A	633807	Intact
B3JDC1	N/A	633808	Intact
B3JDC2	N/A	633809	Intact
B3JFD7	N/A	633810	Intact
B3JFD8	N/A	633811	Intact
B3JFH4	N/A	633812	Intact
B3JFH5	N/A	633813	Intact
B3JFK1	N/A	633814	Intact
B3JFK2	N/A	633815	Intact
B3JFK3	N/A	633834	Intact
B3JFK4	N/A	633835	Intact

Sample Transfer	
Fraction: Inorg	Fraction:
Area #: R-13	Area #:
By: David Garcia	By:
On: 06/27/2018	On:

* Contact SMO and attach record of resolution

Reviewed By: [signature]	Logbook No.: Sample Receipt (61888)
Date: 6.27.18	Logbook Page No.: ✓ 10229 Sec 1 of 3

FORM DC-1 OLMO4.2

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
TASK ORDER(s): 180627-3
SRR: 61888
SDG: 633800
VTSR: 06.27.18
PROJECT#: 20859.01.00X

SAMPLE RESULTS

SOUTHWEST RESEARCH INSTITUTE
WetChem Report
Cover Page

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3

SDG: 633800
SRR: 61888

Case: W18-006
Project: 20859.01.00X

Client Sample ID	Lab Sample ID
B3JCT2	633800
B3JCT2D	633800D
B3JCT6	633801
B3JCV1	633802
B3JCV5	633803
B3JDB0	633804
B3JDB1	633805
B3JDB2	633806
B3JDB3	633807
B3JDC1	633808
B3JDC2	633809
B3JFD7	633810
B3JFD8	633811
B3JFH4	633812
B3JFH4D	633812D
B3JFH5	633813
B3JFK1	633814
B3JFK2	633815
B3JFK3	633834
B3JFK4	633835

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: RSpies
Date: 7/23/18

Name: Radonna Spies
Title: Principal Scientist

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010026 **Client Sample ID**

B3JCT2

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633800
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 12:36
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 10:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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WetChem Report - Form I

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010027 **Client Sample ID**

B3JCT6

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633801
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 12:36
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 10:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010028 **Client Sample ID**

B3JCV1

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633802
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 12:36
57-12-5	Total Cyanide	0.00555		KNO	0.00500	1	20180716-P001	07/05/2018 10:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010029 **Client Sample ID**

B3JCV5

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633803
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 12:36
57-12-5	Total Cyanide	0.00621		KNO	0.00500	1	20180716-P001	07/05/2018 10:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010030 **Client Sample ID**

B3JDB0

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633804
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 12:36
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 10:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010031 **Client Sample ID**

B3JDB1

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633805
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:08
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 10:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010032 **Client Sample ID**

B3JDB2

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633806
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 14:27
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 10:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010033 **Client Sample ID**

B3JDB3

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633807
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 14:27
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010034 **Client Sample ID**

B3JDC1

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633808
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:08
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010035 **Client Sample ID**

B3JDC2

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633809
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:08
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010036 **Client Sample ID**

B3JFD7

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633810
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

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	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010037 **Client Sample ID**

B3JFD8

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633811
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.00515		KNO	0.00500	1	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010038 **Client Sample ID**

B3JFH4

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633812
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:08
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010039 **Client Sample ID**

B3JFH5

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633813
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 14:27
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010040 **Client Sample ID**

B3JFK1

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633814
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/26/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:08
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 11:16

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010041 **Client Sample ID**

B3JFK2

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633815
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/26/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:47
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 12:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010042 **Client Sample ID**

B3JFK3

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633834
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/26/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:47
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 12:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

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010043 **Client Sample ID**

B3JFK4

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633835
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X
Receipt Date: 06/27/2018
Collection Date: 06/26/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	07/05/2018 13:06
57-12-5	Free Cyanide	0.00500	UX	KNO	0.00500	1	NA	07/05/2018 13:47
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/05/2018 12:35

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form I

Certificate of Analysis

010044 **SwRI ID**

PB18G03JH1

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: PB18G03JH1
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case:
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	Total Cyanide	0.00500	U	KNO	0.00500	1	20180716-P001	07/03/2018 15:30

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form I

Certificate of Analysis

010045 **SwRI ID**

PB18G05JH1

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: PB18G05JH1
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
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	Total Cyanide	0.00500	U	KNO	0.00500	1	20180718-P001	07/05/2018 15:48

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form I

Certificate of Analysis

010046 **SwRI ID**

PB18G18JH1

Type: Blank

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: PB18G18JH1
Result Units: mg/L

SDG: 633800
SRR:61888
Matrix: Water
% Solids: NA

Case:
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	NA	0.00500	1	NA	07/05/2018 13:06

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/Cyanide 9014
X - Analytical spike criteria was not met	M - Instrument	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences		
D - Result is reported from a dilution		
* - Duplicate criteria was not met		

Form I-IN

SOUTHWEST RESEARCH INSTITUTE 010047

WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batches: 20180716-A002

SDG: 633800
SRR: 61888
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: W18-006
Project: 20859.01.00X

	Initial Calibration Verification				Continuing Calibration Verification						
Analyte	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Total Cyanide	0.591	0.581	98.3%	90%-110%	0.591	0.596	100.8%	0.549	92.9%	90%-110%	KNO

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

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010048

WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batches: 20180718-A007

SDG: 633800
SRR: 61888
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: W18-006
Project: 20859.01.00X

	Initial Calibration Verification				Continuing Calibration Verification						
Analyte	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Total Cyanide	0.591	0.602	101.9%	90%-110%	0.591	0.605	102.4%	0.600	101.5%	90%-110%	KNO

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

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010049

WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batches: 20180718-A007

SDG: 633800
SRR: 61888
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: W18-006
Project: 20859.01.00X

	Continuing Calibration Verification										
Analyte	True	Found3	%Rec	Found4	%Rec	Found5	%Rec	Found6	%Rec	Limit	M
Total Cyanide	0.591	0.604	102.2%	0.611	103.4%	0.637	107.8%	0.610	103.2%	90%-110%	KNO

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

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010050

WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batches: 20180718-A007

SDG: 633800
SRR: 61888
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: W18-006
Project: 20859.01.00X

	Continuing Calibration Verification								
Analyte	True	Found7	%Rec	Found8	%Rec	Found9	%Rec	Limit	M
Total Cyanide	0.591	0.622	105.2%	0.608	102.9%	0.609	103.0%	90%-110%	KNO

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

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010051

WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batches: 20180718-A008

SDG: 633800
SRR: 61888
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: W18-006
Project: 20859.01.00X

	Initial Calibration Verification				Continuing Calibration Verification						
Analyte	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Free Cyanide	0.591	0.602	101.9%	90%-110%	0.591	0.605	102.4%	0.600	101.5%	90%-110%	KNO

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

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010052

WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batches: 20180718-A008

SDG: 633800
SRR: 61888
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: W18-006
Project: 20859.01.00X

	Continuing Calibration Verification										
Analyte	True	Found3	%Rec	Found4	%Rec	Found5	%Rec	Found6	%Rec	Limit	M
Free Cyanide	0.591	0.604	102.2%	0.611	103.4%	0.637	107.8%	0.610	103.2%	90%-110%	KNO

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

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010053

WetChem Report - Form IIA

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batches: 20180718-A008

SDG: 633800
SRR: 61888
Initial Calibration Source: See Raw Data
Continuing Calibration Source: See Raw Data

Case: W18-006
Project: 20859.01.00X

	Continuing Calibration Verification						
Analyte	True	Found7	%Rec	Found8	%Rec	Limit	M
Free Cyanide	0.591	0.622	105.2%	0.608	102.9%	90%-110%	KNO

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

Form IIA-IN

SOUTHWEST RESEARCH INSTITUTE 010054

WetChem Report - Form IIB

Low Level Check Standard

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batch: 20180716-A002

SDG: 633800
SRR: 61888

Case: W18-006
Project: 20859.01.00X

	LLC Standards				
Analyte	True	Found1	%Rec	Limit	M
Total Cyanide	0.00500	0.00461	92.2%	50%-150%	KNO

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

Form IIB-IN

SOUTHWEST RESEARCH INSTITUTE 010055

WetChem Report - Form IIB

Low Level Check Standard

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batch: 20180718-A007

SDG: 633800
SRR: 61888

Case: W18-006
Project: 20859.01.00X

	LLC Standards				
Analyte	True	Found1	%Rec	Limit	M
Total Cyanide	0.00500	0.00436	87.2%	50%-150%	KNO

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

Form IIB-IN

SOUTHWEST RESEARCH INSTITUTE 010056

WetChem Report - Form IIB

Low Level Check Standard

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L
Associated Analytical Batch: 20180718-A008

SDG: 633800
SRR: 61888

Case: W18-006
Project: 20859.01.00X

	LLC Standards				
Analyte	True	Found1	%Rec	Limit	M
Free Cyanide	0.00500	0.00436	87.2%	50%-150%	KNO

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

Form IIB-IN

SOUTHWEST RESEARCH INSTITUTE 010057

WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 633800
SRR: 61888
Preparation Blank Matrix: Water
Associated Prep Batches: 20180716-P001

Case: W18-006
Project: 20859.01.00X
Associated Analytical Batches: 20180716-A002

	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank				
Analyte	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	M
Total Cyanide	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)	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	KNO - Konelab/Cyanide 9014
X - Analytical spike criteria was not met	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	
D - Result is reported from a dilution	
* - Duplicate criteria was not met	

Form III-IN

SOUTHWEST RESEARCH INSTITUTE 010058

WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 633800
SRR: 61888
Preparation Blank Matrix: Water
Associated Prep Batches: 20180718-P001
20180716-P001

Case: W18-006
Project: 20859.01.00X
Associated Analytical Batches: 20180718-A007

	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank										
Analyte	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	Found3	Qual	Found4	Qual	Found5	Qual	M
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)	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	KNO - Konelab/Cyanide 9014
X - Analytical spike criteria was not met	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	
D - Result is reported from a dilution	
* - Duplicate criteria was not met	

Form III-IN

SOUTHWEST RESEARCH INSTITUTE 010059

WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 633800
SRR: 61888
Preparation Blank Matrix: Water
Associated Prep Batches: 20180718-P001
20180716-P001

Case: W18-006
Project: 20859.01.00X
Associated Analytical Batches: 20180718-A007

	Continuing Calibration Blank								
Analyte	Found6	Qual	Found7	Qual	Found8	Qual	Found9	Qual	M
Total Cyanide	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)	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	KNO - Konelab/Cyanide 9014
X - Analytical spike criteria was not met	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	
D - Result is reported from a dilution	
* - Duplicate criteria was not met	

Form III-IN

SOUTHWEST RESEARCH INSTITUTE 010060

WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Preparation Blank Result Units: NA
Initial/Continuing Blank Result Units: mg/L

SDG: 633800
SRR: 61888
Preparation Blank Matrix: Water
Associated Prep Batches: 20180718-P001
20180716-P001

Case: W18-006
Project: 20859.01.00X
Associated Analytical Batches: 20180718-A008

	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank										
Analyte	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	Found3	Qual	Found4	Qual	Found5	Qual	M
Free Cyanide	-		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)	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	KNO - Konelab/Cyanide 9014
X - Analytical spike criteria was not met	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	
D - Result is reported from a dilution	
* - Duplicate criteria was not met	

Form III-IN

SOUTHWEST RESEARCH INSTITUTE 010061

WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Preparation Blank Result Units: NA
Initial/Continuing Blank Result Units: mg/L

SDG: 633800
SRR: 61888
Preparation Blank Matrix: Water
Associated Prep Batches: 20180718-P001
20180716-P001

Case: W18-006
Project: 20859.01.00X
Associated Analytical Batches: 20180718-A008

	Continuing Calibration Blank						
Analyte	Found6	Qual	Found7	Qual	Found8	Qual	M
Free Cyanide	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)	KNO - Konelab/Cyanide 9012
N - Matrix spike and/or matrix spike duplicate criteria was not met	KNO - Konelab/Cyanide 9014
X - Analytical spike criteria was not met	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	
D - Result is reported from a dilution	
* - Duplicate criteria was not met	

Form III-IN

SOUTHWEST RESEARCH INSTITUTE 010062

WetChem Report - Form III

Blanks

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Preparation Blank Result Units: mg/L
Initial/Continuing Blank Result Units: mg/L

SDG: 633800
SRR: 61888
Preparation Blank Matrix: Water
Associated Prep Batches: NA

Case: W18-006
Project: 20859.01.00X
Associated Analytical Batches: 20180718-A010

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

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

Form III-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VA

Matrix Spike/Matrix Spike Duplicate Sample Recovery

010063 **Client Sample ID**

B3JCT2MS/MSD

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633800S-R
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
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	0.00500	U	0.0412	0.0400	103.0%	-	-	-	-	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/Cyanide 9014
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	Q - Qualifier	
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

Form VA-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VA

Matrix Spike/Matrix Spike Duplicate Sample Recovery

010064 **Client Sample ID**

B3JFH4MS/MSD

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633812S
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
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	0.00500	U	0.0409	0.0400	102.2%	-	-	-	-	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/Cyanide 9014
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	Q - Qualifier	
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

Form VA-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VB

Post-Digestion Spike Sample Recovery

010065 **Client Sample ID**

B3JCT2AS

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633800S-F R
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X

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	0.0316	X	0.0400	**79.0%**	80%-120%	KNO	X	1	NA	07/05/2018 13:48	
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/Cyanide 9014
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	Q - Qualifier	
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

Form VB-IN

Package Name: 633800_WetChem_20180720 [Generated on 07/20/2018 16:52:38]

Program version(8/11/2011)

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VB

Post-Digestion Spike Sample Recovery

010066 **Client Sample ID**

B3JCV1AS

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633802-S-F
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X

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	0.0426	X	0.0400	106.5%	80%-120%	KNO	X	1	NA	07/05/2018 15:48	
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/Cyanide 9014
X - Analytical spike criteria was not met	MSD - Matrix Spike Duplicate	NA - Not Applicable/Amenable Cyanide 9012
E - Result is estimated due to interferences	Q - Qualifier	
D - Result is reported from a dilution	RPD - Relative Percent Difference	
* - Duplicate criteria was not met		

Form VB-IN

Package Name: 633800_WetChem_20180720 [Generated on 07/20/2018 16:52:38]

Program version(8/11/2011)

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VI

Duplicates

010067 **Client Sample ID**

B3JCT2D

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633800D
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	Duplicate Result	Qual	RPD	RPD Limit	Control Limit	M	Note
Amenable Cyanide	0.00500	U	0.00500	U	0.00%	-	-	NA	
Free Cyanide	0.00500	UX	0.00500	UX	0.00%	20%	-	KNO	#
Total Cyanide	0.00500	U	0.00500	U	0.00%	20%	-	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/Cyanide 9014 NA - Not Applicable/Amenable Cyanide 9012

Form VI-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VI

Duplicates

010068 **Client Sample ID**

B3JFH4D

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: 633812D
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
% Solids: NA

Case: W18-006
Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	Duplicate Result	Qual	RPD	RPD Limit	Control Limit	M	Note
Amenable Cyanide	0.00500	U	0.00500	U	0.00%	-	-	NA	
Free Cyanide	0.00500	UX	0.00500	UX	0.00%	20%	-	KNO	#
Total Cyanide	0.00500	U	0.00500	U	0.00%	20%	-	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/Cyanide 9014 NA - Not Applicable/Amenable Cyanide 9012

Form VI-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010069 **SwRI ID**

LCS18G03JH1

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: LCS18G03JH1
Result Units: mg/L

SDG: 633584, 633800
SRR: 61888
Matrix: Water
Associated Prep Batches: 20180716-P001

Case: W18-006
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.591	0.593	D	100.3%	85%-115%	KNO	07/03/2018 15:30

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

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010070 **SwRI ID**

LCS18G03JH2

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: LCS18G03JH2
Result Units: mg/L

SDG: 633584, 633800
SRR: 61888
Matrix: Water
Associated Prep Batches: 20180716-P001

Case: W18-006
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.500	0.454		90.8%	90%-110%	KNO	07/03/2018 15:30

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

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010071 **SwRI ID**

LCS18G03JH3

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: LCS18G03JH3
Result Units: mg/L

SDG: 633584, 633800
SRR: 61888
Matrix: Water
Associated Prep Batches: 20180716-P001

Case: W18-006
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.0500	0.0496		99.2%	90%-110%	KNO	07/03/2018 15:59

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

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010072 **SwRI ID**

LCS18G05CS1

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: LCS18G05CS1
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
Associated Prep Batches: 20180718-P001

Case: W18-006
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.591	0.593	D	100.3%	85%-115%	KNO	07/05/2018 15:49

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

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010073 **SwRI ID**

LCS18G05CS2

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: LCS18G05CS2
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
Associated Prep Batches: 20180718-P001

Case: W18-006
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.500	0.466		93.2%	90%-110%	KNO	07/05/2018 15:49

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

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE

WetChem Report - Form VII

Laboratory Control Sample

010074 **SwRI ID**

LCS18G05CS3

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Lab ID: LCS18G05CS3
Result Units: mg/L

SDG: 633800
SRR: 61888
Matrix: Water
Associated Prep Batches: 20180718-P001

Case: W18-006
Project: 20859.01.00X
LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.0500	0.0537		107.4%	90%-110%	KNO	07/05/2018 16:21

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

Form VII-IN

SOUTHWEST RESEARCH INSTITUTE 010075

WetChem Report - Form IX

Detection Limits

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L

SDG: 633800
SRR: 61888
Instrument: Konelab

Case: W18-006
Project: 20859.01.00X
Date: 01/09/2014

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

Columns
RL - SwRI Reporting Limit

Form IX-IN

Package Name: 633800_WetChem_20180720 [Generated on 07/20/2018 16:52:38]

Program version(8/11/2011)

SOUTHWEST RESEARCH INSTITUTE 010076

WetChem Report - Form IX

Detection Limits

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Result Units: mg/L

SDG: 633800
SRR: 61888
Instrument:

Case: W18-006
Project: 20859.01.00X

Analyte	RL
Amenable Cyanide	0.00500

Columns
RL - SwRI Reporting Limit

Form IX-IN

Package Name: 633800_WetChem_20180720 [Generated on 07/20/2018 16:52:38]

Program version(8/11/2011)

SOUTHWEST RESEARCH INSTITUTE 010077

WetChem Report - Form XII

Analysis Run Log

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Analytical Batch: 20180716-A002
Analysis Method: Cyanide 9012

SDG: 633800
SRR: 61888
Instrument: Konelab

Case: W18-006
Project: 20859.01.00X
Start Date: 07/03/2018
End Date: 07/03/2018

Lab Sample ID	Client Sample ID	Time	DF	ACN	TCN	TCN
CN-0	CN-0	15:00	1			X
CN-0.005	CN-0.005	15:00	1			X
CN-0.01	CN-0.01	15:00	1			X
CN-0.05	CN-0.05	15:00	1			X
CN-0.1	CN-0.1	15:01	1			X
CN-0.25	CN-0.25	15:01	1			X
CN-0.5	CN-0.5	15:01	1			X
CN-ICV	CN-ICV	15:30	2			X
CN-ICB	CN-ICB	15:30	1			X
CN-LLC	NA	15:30	1			X
PB18G03JH1	NA	15:30	1			X
LCS18G03JH1	NA	15:30	2			X
LCS18G03JH2	NA	15:30	1			X
LCS18G03JH3	NA	15:30	1			
Z	Z	15:30	1			
Z	Z	15:30	1			
Z	Z	15:30	1			
Z	Z	15:30	1			
Z	Z	15:30	1			
CN-CCV	CN-CCV	15:59	2			X
CN-CCB	CN-CCB	15:59	1			X
Z	Z	15:59	1			
Z	Z	15:59	1			
Z	Z	15:59	1			
Z	Z	15:59	1			
PB18G03PB1	NA	15:59	1			
Z	Z	15:59	1			
Z	Z	15:59	1			
Z	Z	15:59	1			
Z	Z	15:59	1			
LCS18G03JH3	NA	15:59	1			X
CN-CCV2	CN-CCV2	16:23	2			X
CN-CCB2	CN-CCB2	16:23	1			X
Z	Z	16:23	1			
PB18G03PB1	NA	16:23	1			
CN-CCV3	CN-CCV3	16:23	2			
CN-CCB3	CN-CCB3	16:23	1			

SOUTHWEST RESEARCH INSTITUTE 010078

WetChem Report - Form XII

Analysis Run Log

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Analytical Batch: 20180718-A008
Analysis Method: Cyanide 9014

SDG: 633800
SRR: 61888
Instrument: Konelab

Case: W18-006
Project: 20859.01.00X
Start Date: 07/05/2018
End Date: 07/05/2018

Lab Sample ID	Client Sample ID	Time	DF	ACN	TCN	TCN
CN-0	CN-0	10:05	1		X	
CN-0.005	CN-0.005	10:05	1		X	
CN-0.01	CN-0.01	10:05	1		X	
CN-0.05	CN-0.05	10:05	1		X	
CN-0.1	CN-0.1	10:05	1		X	
CN-0.25	CN-0.25	10:05	1		X	
CN-0.5	CN-0.5	10:05	1		X	
CN-ICV	CN-ICV	10:35	2		X	
CN-ICB	CN-ICB	10:35	1		X	
CN-LLC	NA	10:35	1		X	
Z	Z	10:35	1			
Z	Z	10:35	1			
Z	Z	10:35	1			
Z	Z	10:35	1			
Z	Z	10:35	1			
Z	Z	10:35	1			
Z	Z	10:35	1			
Z	Z	10:35	1			
Z	Z	10:35	1			
CN-CCV	CN-CCV	11:16	2		X	
CN-CCB	CN-CCB	11:16	1		X	
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
Z	Z	11:16	1			
CN-CCV2	CN-CCV2	12:35	2		X	
CN-CCB2	CN-CCB2	12:35	1		X	
Z	Z	12:35	1			
Z	Z	12:35	1			
Z	Z	12:35	1			
633800-F	B3JCT2	12:36	1		X	
633800D-F	B3JCT2D	12:36	1		X	
Z	Z	12:36	1			
633801-F	B3JCT6	12:36	1		X	
633802-F	B3JCV1	12:36	1		X	
633803-F	B3JCV5	12:36	1		X	
633804-F	B3JDB0	12:36	1		X	
CN-CCV3	CN-CCV3	13:08	2		X	
CN-CCB3	CN-CCB3	13:08	1		X	
633805-F	B3JDB1	13:08	1		X	
Z	Z	13:08	1			
Z	Z	13:08	1			
633808-F	B3JDC1	13:08	1		X	
633809-F	B3JDC2	13:08	1		X	
633812-F	B3JFH4	13:08	1		X	
633812D-F	B3JFH4D	13:08	1		X	
Z	Z	13:08	1			
Z	Z	13:08	1			
633814-F	B3JFK1	13:08	1		X	
CN-CCV4	CN-CCV4	13:47	2		X	

SOUTHWEST RESEARCH INSTITUTE 010079

WetChem Report - Form XII

Analysis Run Log

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Analytical Batch: 20180718-A008
Analysis Method: Cyanide 9014

SDG: 633800
SRR: 61888
Instrument: Konelab

Case: W18-006
Project: 20859.01.00X
Start Date: 07/05/2018
End Date: 07/05/2018

Lab Sample ID	Client Sample ID	Time	DF	ACN	TCN	TCN
CN-CCB4	CN-CCB4	13:47	1		X	
633815-F	B3JFK2	13:47	1		X	
633834-F	B3JFK3	13:47	1		X	
633835-F	B3JFK4	13:47	1		X	
Z	Z	13:47	1			
Z	Z	13:47	1			
Z	Z	13:48	1			
Z	Z	13:48	1			
Z	Z	13:48	1			
633800S-F R	B3JCT2AS	13:48	1		X	
Z	Z	13:48	1			
CN-CCV5	CN-CCV5	14:27	2		X	
CN-CCB5	CN-CCB5	14:27	1		X	
633806-F R	B3JDB2	14:27	1		X	
633807-F R	B3JDB3	14:27	1		X	
Z	Z	14:27	1			
633813-F R	B3JFH5	14:27	1		X	
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
CN-CCV6	CN-CCV6	15:10	2		X	
CN-CCB6	CN-CCB6	15:10	1		X	
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
CN-CCV7	CN-CCV7	15:48	2		X	
CN-CCB7	CN-CCB7	15:48	1		X	
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
633802-S-F	B3JCV1AS	15:48	1		X	
PB18G05JH1	NA	15:48	1			
LCS18G05CS1	NA	15:49	2			
LCS18G05CS2	NA	15:49	1			
CN-CCV8	CN-CCV8	16:21	2		X	
CN-CCB8	CN-CCB8	16:21	1		X	
LCS18G05CS3	NA	16:21	1			
CN-CCV9	CN-CCV9	16:21	2			
CN-CCB9	CN-CCB9	16:21	1			

SOUTHWEST RESEARCH INSTITUTE 010080

WetChem Report - Form XII

Analysis Run Log

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Analytical Batch: 20180718-A007
Analysis Method: Cyanide 9012

SDG: 633800
SRR: 61888
Instrument: Konelab

Case: W18-006
Project: 20859.01.00X
Start Date: 07/05/2018
End Date: 07/05/2018

Lab Sample ID	Client Sample ID	Time	DF	ACN	TCN	TCN
CN-0	CN-0	10:05	1			X
CN-0.005	CN-0.005	10:05	1			X
CN-0.01	CN-0.01	10:05	1			X
CN-0.05	CN-0.05	10:05	1			X
CN-0.1	CN-0.1	10:05	1			X
CN-0.25	CN-0.25	10:05	1			X
CN-0.5	CN-0.5	10:05	1			X
CN-ICV	CN-ICV	10:35	2			X
CN-ICB	CN-ICB	10:35	1			X
CN-LLC	NA	10:35	1			X
633800	B3JCT2	10:35	1			X
633800D	B3JCT2D	10:35	1			X
Z	Z	10:35	1			
633801	B3JCT6	10:35	1			X
633802	B3JCV1	10:35	1			X
633803	B3JCV5	10:35	1			X
633804	B3JDB0	10:35	1			X
633805	B3JDB1	10:35	1			X
633806	B3JDB2	10:35	1			X
CN-CCV	CN-CCV	11:16	2			X
CN-CCB	CN-CCB	11:16	1			X
633807	B3JDB3	11:16	1			X
633808	B3JDC1	11:16	1			X
633809	B3JDC2	11:16	1			X
633810	B3JFD7	11:16	1			X
633811	B3JFD8	11:16	1			X
633812	B3JFH4	11:16	1			X
633812D	B3JFH4D	11:16	1			X
633812S	B3JFH4MS	11:16	1			X
633813	B3JFH5	11:16	1			X
633814	B3JFK1	11:16	1			X
CN-CCV2	CN-CCV2	12:35	2			X
CN-CCB2	CN-CCB2	12:35	1			X
633815	B3JFK2	12:35	1			X
633834	B3JFK3	12:35	1			X
633835	B3JFK4	12:35	1			X
Z	Z	12:36	1			
Z	Z	12:36	1			
Z	Z	12:36	1			
Z	Z	12:36	1			
Z	Z	12:36	1			
Z	Z	12:36	1			
Z	Z	12:36	1			
CN-CCV3	CN-CCV3	13:08	2			X
CN-CCB3	CN-CCB3	13:08	1			X
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
Z	Z	13:08	1			
CN-CCV4	CN-CCV4	13:47	2			X

SOUTHWEST RESEARCH INSTITUTE 010081

WetChem Report - Form XII

Analysis Run Log

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Analytical Batch: 20180718-A007
Analysis Method: Cyanide 9012

SDG: 633800
SRR: 61888
Instrument: Konelab

Case: W18-006
Project: 20859.01.00X
Start Date: 07/05/2018
End Date: 07/05/2018

Lab Sample ID	Client Sample ID	Time	DF	ACN	TCN	TCN
CN-CCB4	CN-CCB4	13:47	1			X
Z	Z	13:47	1			
Z	Z	13:47	1			
Z	Z	13:47	1			
633800S-R	B3JCT2MS	13:47	1			X
Z	Z	13:47	1			
Z	Z	13:48	1			
Z	Z	13:48	1			
Z	Z	13:48	1			
Z	Z	13:48	1			
Z	Z	13:48	1			
CN-CCV5	CN-CCV5	14:27	2			X
CN-CCB5	CN-CCB5	14:27	1			X
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
Z	Z	14:27	1			
CN-CCV6	CN-CCV6	15:10	2			X
CN-CCB6	CN-CCB6	15:10	1			X
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
Z	Z	15:10	1			
CN-CCV7	CN-CCV7	15:48	2			X
CN-CCB7	CN-CCB7	15:48	1			X
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
Z	Z	15:48	1			
PB18G05JH1	NA	15:48	1			X
LCS18G05CS1	NA	15:49	2			X
LCS18G05CS2	NA	15:49	1			X
CN-CCV8	CN-CCV8	16:21	2			X
CN-CCB8	CN-CCB8	16:21	1			X
LCS18G05CS3	NA	16:21	1			X
CN-CCV9	CN-CCV9	16:21	2			X
CN-CCB9	CN-CCB9	16:21	1			X

SOUTHWEST RESEARCH INSTITUTE 010082

WetChem Report - Form XII

Analysis Run Log

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Analytical Batch: 20180718-A010
Analysis Method: Amenable Cyanide 9012

SDG: 633800
SRR: 61888
Instrument:

Case: W18-006
Project: 20859.01.00X
Start Date: 07/05/2018
End Date: 07/05/2018

Lab Sample ID	Client Sample ID	Time	DF	ACN	TCN	TCN
PB18G18JH1	NA	13:06	1	X		
633800	B3JCT2	13:06	1	X		
633800D	B3JCT2D	13:06	1	X		
633801	B3JCT6	13:06	1	X		
633802	B3JCV1	13:06	1	X		
633803	B3JCV5	13:06	1	X		
633804	B3JDB0	13:06	1	X		
633805	B3JDB1	13:06	1	X		
633806	B3JDB2	13:06	1	X		
633807	B3JDB3	13:06	1	X		
633808	B3JDC1	13:06	1	X		
633809	B3JDC2	13:06	1	X		
633812	B3JFH4	13:06	1	X		
633812D	B3JFH4D	13:06	1	X		
633813	B3JFH5	13:06	1	X		
633814	B3JFK1	13:06	1	X		
633815	B3JFK2	13:06	1	X		
633834	B3JFK3	13:06	1	X		
633835	B3JFK4	13:06	1	X		

SOUTHWEST RESEARCH INSTITUTE 010083

WetChem Report - Form XVIII

Preparation/Digestion Summary

Client: CH2M Hill Plateau Remediation Company
Task Order: 180627-3

SDG: 633800
SRR: 61888

Case: W18-006
Project: 20859.01.00X

Prep Batch	Method	Preparation Date
20180716-P001	CN prep	07/03/2018

Digestion Log

010084

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180716-P001 (Ver. 1)
Status: CONSUMED

Client(s): CH2M Hill Plateau Remediation Company
Task Order(s): 180622-3, 180627-3
SDG(s): 633584, 633800
Project(s): 20859.01.00X
Method(s): CN prep (TAP: 01-0406-134)
Matrix(s): Water
Reagent(s): 1N NaOH #09-01-WCS15, Releasing Agent #09-02-WCS15, 0.25N NaOH #03-01-WCS15
Pipette(s): 5000-R, 1000-1, 200-3
Heating Device: MICRO-DIST Temperature (C): 120C
Time In: 07/03/2018 11:15:53 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)
PB18G03JH1	NA	6	6
LCS18G03JH1 ①	NA	6	6
LCS18G03JH2 ②	NA	6	6
LCS18G03JH3 ③	NA	6	6
633650	B3JCW1	6	6
633651	B3JCW4	6	6
633652	B3JD18	6	6
633653	B3JD30	6	6
633654	B3JD36	6	6
633655	B3JFL3	6	6
633656	B3JFL4	6	6
633800	B3JCT2	6	6
633800D	B3JCT2	6	6
633800MS ④	B3JCT2	6	6
633801	B3JCT6	6	6
633802	B3JCV1	6	6
633803	B3JCV5	6	6
633804	B3JDB0	6	6
633805	B3JDB1	6	6
633806	B3JDB2	6	6
633807	B3JDB3	6	6
633808	B3JDC1	6	6
633809	B3JDC2	6	6
633810	B3JFD7	6	6
633811	B3JFD8	6	6
633812	B3JFH4	6	6
633812D	B3JFH4	6	6
633812MS ④	B3JFH4	6	6
633813	B3JFH5	6	6
633814	B3JFK1	6	6
633815	B3JFK2	6	6
633834	B3JFK3	6	6
633835	B3JFK4	6	6
633650-C	B3JCW1	6	6
633651-C	B3JCW4	6	6
633652-C	B3JD18	6	6
633653-C	B3JD30	6	6
633654-C	B3JD36	6	6
633655-C	B3JFL3	6	6
633656-C	B3JFL4	6	6
PB18G03PB1	NA	6	6

Prepared by: HERRERA, JUDY Date: 07/03/2018

Reviewed by: MOKEN, JAMES Date: 07/18/2018

Disposal Int/Date/Loc: JM / 07/18/2018 / NA - Consumed

Program version(8/11/2011)

Digestion Log

010085

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180716-P001 (Ver. 1)
Status: CONSUMED

Client(s): CH2M Hill Plateau Remediation Company
Task Order(s): 180622-3, 180627-3
SDG(s): 633584, 633800
Project(s): 20859.01.00X
Method(s): CN prep (TAP: 01-0406-134)
Matrix(s): Water
Reagent(s): 1N NaOH #09-01-WCS15, Releasing Agent #09-02-WCS15, 0.25N NaOH #03-01-WCS15
Pipette(s): 5000-R, 1000-1, 200-3
Heating Device: MICRO-DIST Temperature (C): 120C
Time In: 07/03/2018 11:15:53 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)

① spiked 6 mL of 10-01-WCS15 (Lot# 98545, Source: ERA, Exp: 12/31/2018)
② spiked 6 mL of 10-02-WCS15 (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
③ spiked 6 mL of 10-03-WCS15 (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
④ spiked 6 mL of 10-04-WCS15 (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)

Comments:
All samples had a ph>12 (pH Lot#206416 Exp. date 03/01/19)
All samples had negative lead acetate and KI test papers (Lead Acetate #85205, KI#85038)
Centrifuge tube #550
Timer SN#41471571

Distillation Start: 10:35 Stop: 11:05
Distillation Start: 12:17 Stop: 12:47
Distillation Start: 14:46 Stop: 15:16

Amenable Start: 12:20 Stop: 13:20

Prepared by: HERRERA, JUDY Date: 07/03/2018

Reviewed by: MOKEN, JAMES Date: 07/18/2018

Disposal Int/Date/Loc: JM / 07/18/2018 / NA - Consumed

Program version(8/11/2011)

Digestion Log

010086

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-P001 (Ver. 1)
Status: CONSUMED

Client(s): CH2M Hill Plateau Remediation Company
Task Order(s): 180627-3
SDG(s): 633800
Project(s): 20859.01.00X
Method(s): CN prep (TAP: 01-0406-134)
Matrix(s): Water
Reagent(s): 1N NaOH #09-01-WCS15, 0.25N NaOH #03-01-WCS15, Releasing Agent #09-02-WCS15
Pipette(s): 5000-R, 1000-1, 200-3
Heating Device: MICRO-DIST Temperature (C): 120C
Time In: 07/05/2018 10:26:02 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)
PB18G05JH1	NA	6	6
633800-C	B3JCT2	6	6
633800D-C	B3JCT2	6	6
633800MS-C ①	B3JCT2	6	6
633801-C	B3JCT6	6	6
633802-C	B3JCV1	6	6
633803-C	B3JCV5	6	6
633804-C	B3JDB0	6	6
633805-C	B3JDB1	6	6
633806-C	B3JDB2	6	6
633807-C	B3JDB3	6	6
633808-C	B3JDC1	6	6
633809-C	B3JDC2	6	6
633810-C	B3JFD7	6	6
633811-C	B3JFD8	6	6
633812-C	B3JFH4	6	6
633813-C	B3JFH5	6	6
633814-C	B3JFK1	6	6
633815-C	B3JFK2	6	6
633834-C	B3JFK3	6	6
633835-C	B3JFK4	6	6
LCS18G05CS1 ②	NA	6	6
LCS18G05CS2 ③	NA	6	6
LCS18G05CS3 ④	NA	6	6

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

Disposal Int/Date/Loc: JM / 07/20/2018 / NA - Consumed

Program version(8/11/2011)

Digestion Log

010087

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-P001 (Ver. 1)
Status: CONSUMED

Client(s): CH2M Hill Plateau Remediation Company
Task Order(s): 180627-3
SDG(s): 633800
Project(s): 20859.01.00X
Method(s): CN prep (TAP: 01-0406-134)
Matrix(s): Water
Reagent(s): 1N NaOH #09-01-WCS15, 0.25N NaOH #03-01-WCS15, Releasing Agent #09-02-WCS15
Pipette(s): 5000-R, 1000-1, 200-3
Heating Device: MICRO-DIST Temperature (C): 120C
Time In: 07/05/2018 10:26:02 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)

① spiked 6 mL of 10-04-WCS15 (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
② spiked 6 mL of 11-03-WCS15 (Lot# 98545, Source: ERA, Exp: 12/31/2018)
③ spiked 6 mL of 11-04-WCS15 (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
④ spiked 6 mL of 11-05-WCS15 (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)

Comments:
All samples had a ph>12 (pH Lot#206416 Exp. date 03/30/19)
All samples had negative lead acetate and KI test papers (Lead Acetate #85205, KI#85038)
Centrifuge tube #550
Timer SN#41471571

Distillation Start: 13:27 Stop: 13:57
Distillation Start: 15:22 Stop: 15:52

Chlorinated with batch#20180716-P001
batch #20180718-P001 distillation only

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

Disposal Int/Date/Loc: JM / 07/20/2018 / NA - Consumed

Program version(8/11/2011)

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
TASK ORDER(s): 180627-3
SRR: 61888
SDG: 633800
VTSR: 06.27.18
PROJECT#: 20859.01.00X

Cyanide Raw Data

CN SW846 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180716-A002 (Ver. 1)
Status: CONSUMED

Analyte Test: CN SW846 9012
Limit: CN water limit
Analysis Method: Cyanide 9012 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: 180622-3.xls
Start Time: 07/03/2018 15:00:00
Stop Time: 07/03/2018 16:23:00
Task Order: 180622-3, 180627-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633584, 633800
Qualifier Set: Default
Reagent: 0.25N NaOH #03-01-WCS15, Chloramine-T #09-03-WCS15, Pyridine #166-01-WCS14, Buffer #165-02-WCS14
Pipette: 5000-R, 1000-1, 200-3

			Total Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
CN-0	NA		-0.00111	-0.00111			
CN-0.005	NA		0.00376	0.00376			
CN-0.01	NA		0.00932	0.00932			
CN-0.05	NA		0.0509	0.0509			
CN-0.1	NA		0.104	0.104			
CN-0.25	NA		0.247	0.247			
CN-0.5	NA		0.500	0.500			
CN-ICV ②	NA	2	0.581 D	0.581 D	0.0100	98.3	
CN-ICB	NA		-0.000100 U	0.00500 U	0.00500		
CN-LLC ①	NA		0.00461	0.00461	0.00500	92.2	
PB18G03JH1 ②	NA		-0.000450 U	0.00500 U	0.00500		
LCS18G03JH1 ②	NA	2	0.593 D	0.593 D	0.0100	100	
LCS18G03JH2 ②	NA		0.454	0.454	0.00500	90.8	
LCS18G03JH3 ②	NA		*0.0606*	*0.0606*	*0.00500*	*121*	
633650 ②	B3JCW1		0.0720	0.0720	0.00500		
633651 ②	B3JCW4		0.0440	0.0440	0.00500		
633654 ②	B3JD36		0.00292 U	0.00500 U	0.00500		
633655 ②	B3JFL3		-0.000430 U	0.00500 U	0.00500		
633656 ②	B3JFL4		-0.000710 U	0.00500 U	0.00500		
CN-CCV ②	NA	2	0.596 D	0.596 D	0.0100	101	
CN-CCB	NA		-0.000150 U	0.00500 U	0.00500		
633650-F	B3JCW1		*0.00252 U*	*0.00500 U*	*0.00500*		
633651-F	B3JCW4		*0.00404 U*	*0.00500 U*	*0.00500*		
633655-F	B3JFL3		*0.0111*	*0.0111*	*0.00500*		
633656-F	B3JFL4		*-0.00168 U*	*0.00500 U*	*0.00500*		
PB18G03PB1 ②	NA		*0.0170*	*0.0170*	*0.00500*		
633650-C ②	B3JCW1		*0.0243*	*0.0243*	*0.00500*		
633651-C ②	B3JCW4		*0.0288*	*0.0288*	*0.00500*		
633655-C ②	B3JFL3		*-0.000860 U*	*0.00500 U*	*0.00500*		
633656-C ②	B3JFL4		*-0.000610 U*	*0.00500 U*	*0.00500*		
LCS18G03JH3 ②	NA		0.0496	0.0496	0.00500	99.2	
CN-CCV2 ②	NA	2	0.549 D	0.549 D	0.0100	92.9	
CN-CCB2	NA		-0.000300 U	0.00500 U	0.00500		
633655-F R	B3JFL3		*-0.00711 UL*	*0.00500 UL*	*0.00500*		
PB18G03PB1 ②	NA		*0.00435 U*	*0.00500 U*	*0.00500*		
CN-CCV3 ②	NA	2	*0.595 D*	*0.595 D*	*0.0100*	*101*	

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/03/2018

Reviewed by: MOKEN, JAMES Date: 07/18/2018

CN SW846 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180716-A002 (Ver. 1)
Status: CONSUMED

Analyte Test: CN SW846 9012
Limit: CN water limit
Analysis Method: Cyanide 9012 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: 180622-3.xls
Start Time: 07/03/2018 15:00:00
Stop Time: 07/03/2018 16:23:00
Task Order: 180622-3, 180627-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633584, 633800
Qualifier Set: Default
Reagent: 0.25N NaOH #03-01-WCS15, Chloramine-T #09-03-WCS15, Pyridine #166-01-WCS14, Buffer #165-02-WCS14
Pipette: 5000-R, 1000-1, 200-3

			Total Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
CN-CCB3	NA		*-0.000480 U*	*0.00500 U*	*0.00500*		

① spiked 0.0005 mL of 125-02-WCS14 (Lot# 94147, Source: ERA, Exp: 10/31/2018) with Total Cyanide at 100 mg/L to FV 10 mL

② samples prepared in batch 20180716-P001

Comments:
Calibration Curve:

1 ppm CN std was prepared from 100 ppm CN std, 200uL of #125-02-WCS14 to final volume 20 mL with 0.25N NaOH

point (mg/L)	1 ppm (mL)	DI water (mL)	
0.5	5.0	5.0	
0.25	2.5	7.5	
0.1	1.0	9.0	
0.05	0.5	9.5	
0.01	0.1	9.9	
0.005	0.05	9.95	LLC

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/03/2018

Reviewed by: MOKEN, JAMES Date: 07/18/2018

==========010091=

Calibration results AquaKem 6.5 Page: 1

Laboratory
Konelab User

03.07.2018 16:01

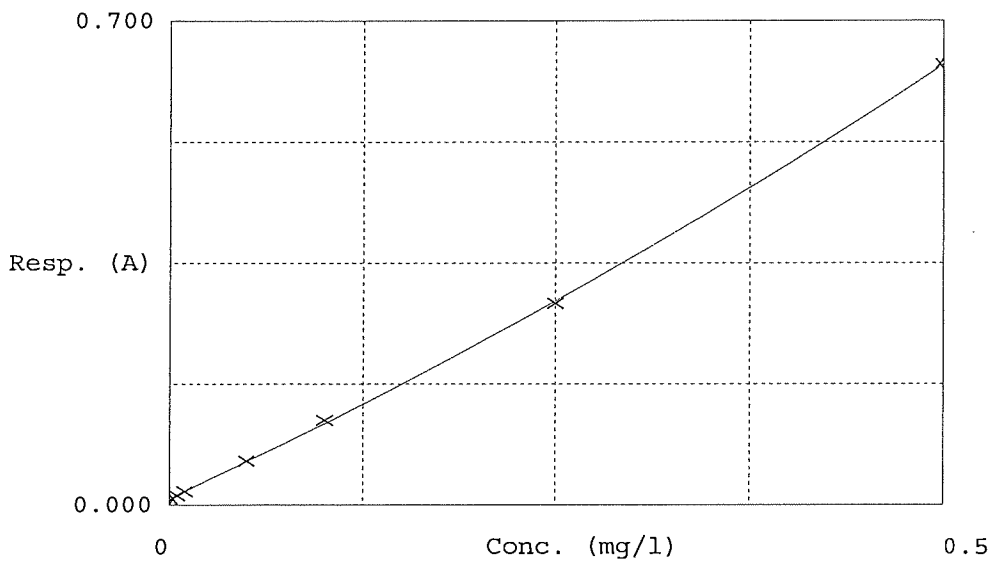
Test Cyanide

Accepted 03.07.2018 16:01

Resp. = A * Conc. ^ 2 + B * Conc. + C
A = 0.450
B = 1.029
C = 0.010

Coeff. of det. 0.999875

Errors



	Calibrator	Response	Calc. con.	Conc.	Errors
1	CN-0	0.009	-0.00111	0.00000	
2	CN-0.005	0.014	0.00376	0.00500	
3	CN-0.01	0.020	0.00932	0.01000	
4	CN-0.05	0.064	0.05092	0.05000	
5	CN-0.1	0.122	0.10436	0.10000	
6	CN-0.25	0.292	0.24731	0.25000	
7	CN-0.5	0.638	0.50043	0.50000	

#20180716-P001
20180716-A002 (tot.)
20180716-A003 (Free)
20180716-A004 (Amenable)

010092

Test results AquaKem 6.5 Page: 1

Laboratory
Konelab User

03.07.2018 17:30

Test: Cyanide

Sample Id	Result	Dil. 1 +	Response	Errors
CN-ICV DF2	0.5806	0.0	0.347	
CN-ICB	-0.0001	0.0	0.010	Test limit low
CN-LLC	0.0046	0.0	0.015	
PBW	-0.0004	0.0	0.010	Test limit low
LCSW DF2	0.5933	0.0	0.355	
LCSH	0.4544	0.0	0.570	
LCSL	0.0606	0.0	0.074	
633650	0.0720	0.0	0.086	
633651	0.0439	0.0	0.056	
633654	0.0029	0.0	0.013	
633655	-0.0004	0.0	0.010	Test limit low
633656	-0.0007	0.0	0.009	Test limit low
CN-CCV DF2	0.5963	0.0	0.357	
CN-CCB	-0.0001	0.0	0.010	Test limit low
633650-F	0.0025	0.0	0.013	
633651-F	0.0040	0.0	0.014	
633655-F	0.0111	0.0	0.021	
633656-F	-0.0017	0.0	0.008	Test limit low
PB-C	0.0170	0.0	0.028	
633650-C	0.0243	0.0	0.035	
633651-C	0.0288	0.0	0.040	
633655-C	-0.0009	0.0	0.009	Test limit low
633656-C	-0.0006	0.0	0.009	Test limit low
LCSL-R	0.0496	0.0	0.062	
CN-CCV2 DF2	0.5492	0.0	0.326	
CN-CCB2	-0.0003	0.0	0.010	Test limit low
633655-F R	-0.0071	0.0	0.003	Test limit low
PB-C R	0.0043	0.0	0.014	
CN-CCV3 DF2	0.5949	0.0	0.356	
CN-CCB3	-0.0005	0.0	0.009	Test limit low

N	30
Mean	0.1227
SD	0.22515
CV%	183.47

CN SW846 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A007 (Ver. 1)
Status: CONSUMED

Analyte Test: CN SW846 9012
Limit: CN water limit
Analysis Method: Cyanide 9012 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
Stop Time: 07/05/2018 16:21:00
Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3

			Total Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
CN-0	NA		-0.000580 U	0.00500 U	0.00500		
CN-0.005	NA		0.00407	0.00407			
CN-0.01	NA		0.00949	0.00949			
CN-0.05	NA		0.0509	0.0509			
CN-0.1	NA		0.103	0.103			
CN-0.25	NA		0.248	0.248			
CN-0.5	NA		0.500	0.500			
CN-ICV ②	NA	2	0.602 D	0.602 D	0.0100	102	
CN-ICB	NA		-0.000310 U	0.00500 U	0.00500		
CN-LLC ①	NA		0.00436	0.00436	0.00500	87.2	
633800 ③	B3JCT2		0.0000300 U	0.00500 U	0.00500		
633800D ③	B3JCT2		0.000190 U	0.00500 U	0.00500		0.00
633800S ③	B3JCT2		*0.0608*	*0.0608*	*0.00500*	*152*	
633801 ③	B3JCT6		0.00168 U	0.00500 U	0.00500		
633802 ③	B3JCV1		0.00555	0.00555	0.00500		
633803 ③	B3JCV5		0.00621	0.00621	0.00500		
633804 ③	B3JDB0		0.000420 U	0.00500 U	0.00500		
633805 ③	B3JDB1		-0.000650 U	0.00500 U	0.00500		
633806 ③	B3JDB2		-0.000780 U	0.00500 U	0.00500		
CN-CCV ②	NA	2	0.605 D	0.605 D	0.0100	102	
CN-CCB	NA		-0.000260 U	0.00500 U	0.00500		
633807 ③	B3JDB3		0.000410 U	0.00500 U	0.00500		
633808 ③	B3JDC1		0.000200 U	0.00500 U	0.00500		
633809 ③	B3JDC2		0.00137 U	0.00500 U	0.00500		
633810 ③	B3JFD7		-0.000220 U	0.00500 U	0.00500		
633811 ③	B3JFD8		0.00515	0.00515	0.00500		
633812 ③	B3JFH4		-0.000180 U	0.00500 U	0.00500		
633812D ③	B3JFH4		-0.000720 U	0.00500 U	0.00500		0.00
633812S ③	B3JFH4		0.0409	0.0409	0.00500	102	
633813 ③	B3JFH5		-0.000370 U	0.00500 U	0.00500		
633814 ③	B3JFK1		0.000720 U	0.00500 U	0.00500		
CN-CCV2 ②	NA	2	0.600 D	0.600 D	0.0100	102	
CN-CCB2	NA		-0.000410 U	0.00500 U	0.00500		
633815 ③	B3JFK2		0.00102 U	0.00500 U	0.00500		
633834 ③	B3JFK3		-0.000620 U	0.00500 U	0.00500		
633835 ③	B3JFK4		-0.000730 U	0.00500 U	0.00500		

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

CN SW846 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A007 (Ver. 1)
Status: CONSUMED

Analyte Test: CN SW846 9012
Limit: CN water limit
Analysis Method: Cyanide 9012 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
Stop Time: 07/05/2018 16:21:00
Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3

			Total Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
633800-F	B3JCT2		-0.000520 U	0.00500 U	0.00500		
633800D-F	B3JCT2		-0.00191 U	0.00500 U	0.00500		0.00
633800S-F	B3JCT2		-0.000640 U	0.00500 U	0.00500		
633801-F	B3JCT6		-0.000120 U	0.00500 U	0.00500		
633802-F	B3JCV1		0.00176 U	0.00500 U	0.00500		
633803-F	B3JCV5		0.00244 U	0.00500 U	0.00500		
633804-F	B3JDB0		-0.00533 UL	0.00500 UL	0.00500		
CN-CCV3 ②	NA	2	0.604 D	0.604 D	0.0100	102	
CN-CCB3	NA		-0.000550 U	0.00500 U	0.00500		
633805-F	B3JDB1		-0.00755 UL	0.00500 UL	0.00500		
633806-F	B3JDB2		-0.0193 UL	0.00500 UL	0.00500		
633807-F	B3JDB3		-0.0136 UL	0.00500 UL	0.00500		
633808-F	B3JDC1		-0.00349 U	0.00500 U	0.00500		
633809-F	B3JDC2		-0.000290 U	0.00500 U	0.00500		
633812-F	B3JFH4		-0.000150 U	0.00500 U	0.00500		
633812D-F	B3JFH4		-0.000790 U	0.00500 U	0.00500		0.00
633812S-F	B3JFH4		0.0704	0.0704	0.00500		
633813-F	B3JFH5		0.0376	0.0376	0.00500		
633814-F	B3JFK1		-0.000780 U	0.00500 U	0.00500		
CN-CCV4 ②	NA	2	0.611 D	0.611 D	0.0100	103	
CN-CCB4	NA		-0.000430 U	0.00500 U	0.00500		
633815-F	B3JFK2		0.00129 U	0.00500 U	0.00500		
633834-F	B3JFK3		0.00283 U	0.00500 U	0.00500		
633835-F	B3JFK4		0.000200 U	0.00500 U	0.00500		
633800S-R ③	B3JCT2		0.0412	0.0412	0.00500	103	
633802-R ③	B3JCV1		0.00586	0.00586	0.00500		
633803-R ③	B3JCV5		0.00628	0.00628	0.00500		
633811-R ③	B3JFD8		0.00496 U	0.00500 U	0.00500		
633804-F R	B3JDB0		-0.0110 UL	0.00500 UL	0.00500		
633800S-F R	B3JCT2		0.0316	0.0316	0.00500		
633805-F R	B3JDB1		-0.00519 UL	0.00500 UL	0.00500		
CN-CCV5 ②	NA	2	0.637 D	0.637 D	0.0100	108	
CN-CCB5	NA		-0.000350 U	0.00500 U	0.00500		
633806-F R	B3JDB2		0.000660 U	0.00500 U	0.00500		
633807-F R	B3JDB3		-0.00191 U	0.00500 U	0.00500		
633812S-F R	B3JFH4		0.0124	0.0124	0.00500		

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

CN SW846 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A007 (Ver. 1)
Status: CONSUMED

Analyte Test: CN SW846 9012
Limit: CN water limit
Analysis Method: Cyanide 9012 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
Stop Time: 07/05/2018 16:21:00
Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3

			Total Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
633813-F R	B3JFH5		-0.0000500 U	0.00500 U	0.00500		
633800-C ②	B3JCT2		-0.000760 U	0.00500 U	0.00500		
633800D-C	B3JCT2		-0.000810 U	0.00500 U	0.00500		0.00
633801-C ②	B3JCT6		-0.000700 U	0.00500 U	0.00500		
633802-C ②	B3JCV1		0.0148	0.0148	0.00500		
633803-C ②	B3JCV5		0.000480 U	0.00500 U	0.00500		
633804-C ②	B3JDB0		0.000370 U	0.00500 U	0.00500		
CN-CCV6 ②	NA	2	0.610 D	0.610 D	0.0100	103	
CN-CCB6	NA		0.0000200 U	0.00500 U	0.00500		
633813S-F	B3JFH5		0.00142 U	0.00500 U	0.00500		
633800S-C ②	B3JCT2		-0.000510 U	0.00500 U	0.00500		
633805-C ②	B3JDB1		-0.000590 U	0.00500 U	0.00500		
633806-C ②	B3JDB2		-0.000580 U	0.00500 U	0.00500		
633807-C ②	B3JDB3		-0.000980 U	0.00500 U	0.00500		
633808-C ②	B3JDC1		-0.000340 U	0.00500 U	0.00500		
633809-C ②	B3JDC2		-0.000400 U	0.00500 U	0.00500		
633812-C ②	B3JFH4		-0.000300 U	0.00500 U	0.00500		
633812D-C ②	B3JFH4		-0.000610 U	0.00500 U	0.00500		0.00
633812S-C ②	B3JFH4		-0.000500 U	0.00500 U	0.00500		
CN-CCV7 ②	NA	2	0.622 D	0.622 D	0.0100	105	
CN-CCB7	NA		-0.000240 U	0.00500 U	0.00500		
633813-C ②	B3JFH5		-0.000310 U	0.00500 U	0.00500		
633814-C ②	B3JFK1		-0.000360 U	0.00500 U	0.00500		
633815-C ②	B3JFK2		-0.000490 U	0.00500 U	0.00500		
633834-C ②	B3JFK3		-0.000780 U	0.00500 U	0.00500		
633835-C ②	B3JFK4		-0.000130 U	0.00500 U	0.00500		
633802-C R	B3JCV1		-0.000360 U	0.00500 U	0.00500		
633802-S-F	B3JCV1		0.0426	0.0426	0.00500		
PB18G05JH1 ②	NA		-0.000270 U	0.00500 U	0.00500		
LCS18G05CS1 ②	NA	2	0.593 D	0.593 D	0.0100	100	
LCS18G05CS2 ②	NA		0.466	0.466	0.00500	93.2	
CN-CCV8 ②	NA	2	0.608 D	0.608 D	0.0100	103	
CN-CCB8	NA		0.000510 U	0.00500 U	0.00500		
LCS18G05CS3 ②	NA		0.0537	0.0537	0.00500	107	
CN-CCV9 ②	NA	2	0.609 D	0.609 D	0.0100	103	
CN-CCB9	NA		-0.000270 U	0.00500 U	0.00500		

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

CN SW846 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A007 (Ver. 1)
Status: CONSUMED

Analyte Test: CN SW846 9012
Limit: CN water limit
Analysis Method: Cyanide 9012 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
Stop Time: 07/05/2018 16:21:00
Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3

		Total Cyanide				
Sample Identification	Client Identification	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)

① spiked 0.0005 mL of 125-02-WCS14 (Lot# 94147, Source: ERA, Exp: 10/31/2018) with Total Cyanide at 100 mg/L to FV 10 mL

② prepared in batch 20180718-P001
③ prepared in batch 20180716-P001

Comments:
Calibration Curve:

1 ppm CN std was prepared from 100 ppm CN std, 200uL of #125-02-WCS14 to final volume 20 mL with 0.25N NaOH

point (mg/L)	1 ppm (mL)	DI water (mL)	
0.5	5.0	5.0	
0.25	2.5	7.5	
0.1	1.0	9.0	
0.05	0.5	9.5	
0.01	0.1	9.9	
0.005	0.05	9.95	LLC

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

CN SW-846 9014

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A008 (Ver. 1)
Status: CONSUMED

Limit: CN water limit
Analysis Method: Cyanide 9014 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
Stop Time: 07/05/2018 16:21:00
Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3
Analyte Test: CN SW-846 9014

			Free Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
CN-0	NA		-0.000580 U	0.00500 U	0.00500		
CN-0.005	NA		0.00407	0.00407			
CN-0.01	NA		0.00949	0.00949			
CN-0.05	NA		0.0509	0.0509			
CN-0.1	NA		0.103	0.103			
CN-0.25	NA		0.248	0.248			
CN-0.5	NA		0.500	0.500			
CN-ICV ④	NA	2	0.602 D	0.602 D	0.0100	102	
CN-ICB	NA		-0.000310 U	0.00500 U	0.00500		
CN-LLC ①	NA		0.00436	0.00436	0.00500	87.2	
633800 ⑤	B3JCT2		*0.0000300 UX*	*0.00500 UX*	*0.00500 X*		
633800D ⑤	B3JCT2		*0.000190 UX*	*0.00500 UX*	*0.00500 X*		*0.00 X*
633800S ⑤	B3JCT2		*0.0608 X*	*0.0608 X*	*0.00500 X*		
633801 ⑤	B3JCT6		*0.00168 UX*	*0.00500 UX*	*0.00500 X*		
633802 ⑤	B3JCV1		*0.00555 X*	*0.00555 X*	*0.00500 X*		
633803 ⑤	B3JCV5		*0.00621 X*	*0.00621 X*	*0.00500 X*		
633804 ⑤	B3JDB0		*0.000420 UX*	*0.00500 UX*	*0.00500 X*		
633805 ⑤	B3JDB1		*-0.000650 UX*	*0.00500 UX*	*0.00500 X*		
633806 ⑤	B3JDB2		*-0.000780 UX*	*0.00500 UX*	*0.00500 X*		
CN-CCV ④	NA	2	0.605 D	0.605 D	0.0100	102	
CN-CCB	NA		-0.000260 U	0.00500 U	0.00500		
633807 ⑤	B3JDB3		*0.000410 UX*	*0.00500 UX*	*0.00500 X*		
633808 ⑤	B3JDC1		*0.000200 UX*	*0.00500 UX*	*0.00500 X*		
633809 ⑤	B3JDC2		*0.00137 UX*	*0.00500 UX*	*0.00500 X*		
633810 ⑤	B3JFD7		*-0.000220 UX*	*0.00500 UX*	*0.00500 X*		
633811 ⑤	B3JFD8		*0.00515 X*	*0.00515 X*	*0.00500 X*		
633812 ⑤	B3JFH4		*-0.000180 UX*	*0.00500 UX*	*0.00500 X*		
633812D ⑤	B3JFH4		*-0.000720 UX*	*0.00500 UX*	*0.00500 X*		*0.00 X*
633812S ⑤	B3JFH4		*0.0409 X*	*0.0409 X*	*0.00500 X*		
633813 ⑤	B3JFH5		*-0.000370 UX*	*0.00500 UX*	*0.00500 X*		
633814 ⑤	B3JFK1		*0.000720 UX*	*0.00500 UX*	*0.00500 X*		
CN-CCV2 ④	NA	2	0.600 D	0.600 D	0.0100	102	
CN-CCB2	NA		-0.000410 U	0.00500 U	0.00500		
633815 ⑤	B3JFK2		*0.00102 UX*	*0.00500 UX*	*0.00500 X*		
633834 ⑤	B3JFK3		*-0.000620 UX*	*0.00500 UX*	*0.00500 X*		
633835 ⑤	B3JFK4		*-0.000730 UX*	*0.00500 UX*	*0.00500 X*		

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

CN SW-846 9014

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A008 (Ver. 1)
Status: CONSUMED

Limit: CN water limit
Analysis Method: Cyanide 9014 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
Stop Time: 07/05/2018 16:21:00
Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3
Analyte Test: CN SW-846 9014

			Free Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
633800-F	B3JCT2		-0.000520 UX	0.00500 UX	0.00500		
633800D-F	B3JCT2		-0.00191 UX	0.00500 UX	0.00500		0.00
633800S-F	B3JCT2		*-0.000640 UX*	*0.00500 UX*	*0.00500 X*		
633801-F	B3JCT6		-0.000120 UX	0.00500 UX	0.00500		
633802-F	B3JCV1		0.00176 UX	0.00500 UX	0.00500		
633803-F	B3JCV5		0.00244 UX	0.00500 UX	0.00500		
633804-F	B3JDB0		-0.00533 ULX	0.00500 ULX	0.00500		
CN-CCV3 ④	NA	2	0.604 D	0.604 D	0.0100	102	
CN-CCB3	NA		-0.000550 U	0.00500 U	0.00500		
633805-F	B3JDB1		-0.00755 ULX	0.00500 ULX	0.00500		
633806-F	B3JDB2		*-0.0193 ULX*	*0.00500 ULX*	*0.00500 X*		
633807-F	B3JDB3		*-0.0136 ULX*	*0.00500 ULX*	*0.00500 X*		
633808-F	B3JDC1		-0.00349 UX	0.00500 UX	0.00500		
633809-F	B3JDC2		-0.000290 UX	0.00500 UX	0.00500		
633812-F	B3JFH4		-0.000150 UX	0.00500 UX	0.00500		
633812D-F	B3JFH4		-0.000790 UX	0.00500 UX	0.00500		0.00
633812S-F	B3JFH4		*0.0704 X*	*0.0704 X*	*0.00500 X*		
633813-F	B3JFH5		*0.0376 X*	*0.0376 X*	*0.00500 X*		
633814-F	B3JFK1		-0.000780 UX	0.00500 UX	0.00500		
CN-CCV4 ④	NA	2	0.611 D	0.611 D	0.0100	103	
CN-CCB4	NA		-0.000430 U	0.00500 U	0.00500		
633815-F	B3JFK2		0.00129 UX	0.00500 UX	0.00500		
633834-F	B3JFK3		0.00283 UX	0.00500 UX	0.00500		
633835-F	B3JFK4		0.000200 UX	0.00500 UX	0.00500		
633800S-R ⑤	B3JCT2		*0.0412 X*	*0.0412 X*	*0.00500 X*		
633802-R ⑤	B3JCV1		*0.00586 X*	*0.00586 X*	*0.00500 X*		
633803-R ⑤	B3JCV5		*0.00628 X*	*0.00628 X*	*0.00500 X*		
633811-R ⑤	B3JFD8		*0.00496 UX*	*0.00500 UX*	*0.00500 X*		
633804-F R	B3JDB0		*-0.0110 ULX*	*0.00500 ULX*	*0.00500 X*		
633800S-F R ②	B3JCT2		0.0316 X	0.0316 X	0.00500	79.0	
633805-F R	B3JDB1		*-0.00519 ULX*	*0.00500 ULX*	*0.00500 X*		*200 X*
CN-CCV5 ④	NA	2	0.637 D	0.637 D	0.0100	108	
CN-CCB5	NA		-0.000350 U	0.00500 U	0.00500		
633806-F R	B3JDB2		0.000660 UX	0.00500 UX	0.00500		
633807-F R	B3JDB3		-0.00191 UX	0.00500 UX	0.00500		
633812S-F R	B3JFH4		*0.0124 X*	*0.0124 X*	*0.00500 X*		

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

CN SW-846 9014

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A008 (Ver. 1)
Status: CONSUMED

Limit: CN water limit
Analysis Method: Cyanide 9014 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
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Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3
Analyte Test: CN SW-846 9014

			Free Cyanide				
Sample Identification	Client Identification	DF	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)
633813-F R	B3JFH5		-0.0000500 UX	0.00500 UX	0.00500		
633800-C ④	B3JCT2		-0.000760 UX	0.00500 UX	0.00500 X		
633800D-C	B3JCT2		-0.000810 UX	0.00500 UX	0.00500 X		0.00 X
633801-C ④	B3JCT6		-0.000700 UX	0.00500 UX	0.00500 X		
633802-C ④	B3JCV1		0.0148 X	0.0148 X	0.00500 X		
633803-C ④	B3JCV5		0.000480 UX	0.00500 UX	0.00500 X		
633804-C ④	B3JDB0		0.000370 UX	0.00500 UX	0.00500 X		
CN-CCV6 ④	NA	2	0.610 D	0.610 D	0.0100	103	
CN-CCB6	NA		0.0000200 U	0.00500 U	0.00500		
633813S-F	B3JFH5		0.00142 UX	0.00500 UX	0.00500 X		
633800S-C ④	B3JCT2		-0.000510 UX	0.00500 UX	0.00500 X		
633805-C ④	B3JDB1		-0.000590 UX	0.00500 UX	0.00500 X		
633806-C ④	B3JDB2		-0.000580 UX	0.00500 UX	0.00500 X		
633807-C ④	B3JDB3		-0.000980 UX	0.00500 UX	0.00500 X		
633808-C ④	B3JDC1		-0.000340 UX	0.00500 UX	0.00500 X		
633809-C ④	B3JDC2		-0.000400 UX	0.00500 UX	0.00500 X		
633812-C ④	B3JFH4		-0.000300 UX	0.00500 UX	0.00500 X		
633812D-C ④	B3JFH4		-0.000610 UX	0.00500 UX	0.00500 X		0.00 X
633812S-C ④	B3JFH4		-0.000500 UX	0.00500 UX	0.00500 X		
CN-CCV7 ④	NA	2	0.622 D	0.622 D	0.0100	105	
CN-CCB7	NA		-0.000240 U	0.00500 U	0.00500		
633813-C ④	B3JFH5		-0.000310 UX	0.00500 UX	0.00500 X		
633814-C ④	B3JFK1		-0.000360 UX	0.00500 UX	0.00500 X		
633815-C ④	B3JFK2		-0.000490 UX	0.00500 UX	0.00500 X		
633834-C ④	B3JFK3		-0.000780 UX	0.00500 UX	0.00500 X		
633835-C ④	B3JFK4		-0.000130 UX	0.00500 UX	0.00500 X		
633802-C R	B3JCV1		-0.000360 UX	0.00500 UX	0.00500 X		
633802-S-F ③	B3JCV1		0.0426 X	0.0426 X	0.00500	107	
PB18G05JH1 ④	NA		-0.000270 U	0.00500 U	0.00500		
LCS18G05CS1 ④	NA	2	0.593 D	0.593 D	0.0100	100	
LCS18G05CS2 ④	NA		0.466	0.466	0.00500		
CN-CCV8 ④	NA	2	0.608 D	0.608 D	0.0100	103	
CN-CCB8	NA		0.000510 U	0.00500 U	0.00500		
LCS18G05CS3 ④	NA		0.0537	0.0537	0.00500		
CN-CCV9 ④	NA	2	0.609 D	0.609 D	0.0100	103	
CN-CCB9	NA		-0.000270 U	0.00500 U	0.00500		

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

CN SW-846 9014

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A008 (Ver. 1)
Status: CONSUMED

Limit: CN water limit
Analysis Method: Cyanide 9014 (TAP: TAP-01-0406-134)
Instrument: Konelab
Data File Name: CH2M-7-6-18 (2).xls
Start Time: 07/05/2018 10:05:00
Stop Time: 07/05/2018 16:21:00
Task Order: 180627-3, 180622-3
Project: 20859.01.00X
Customer: CH2M Hill Plateau Remediation Company
SDG: 633800, 633584, 633800
Qualifier Set: Default
Reagent: Pyridine #166-01-WCS14, Chloramine-T #11-01-WCS15, Buffer #165-02-WCS14, 0.25N NaOH #03-01-WCS15
Pipette: 5000-R, 1000-1, 200-3
Analyte Test: CN SW-846 9014

		Free Cyanide				
Sample Identification	Client Identification	Cyanide result water (mg/L)	Final Result (mg/L)	RL (mg/L)	Rec (%)	RPD (%)

① spiked 0.0005 mL of 125-02-WCS14 (Lot# 94147, Source: ERA, Exp: 10/31/2018) with Free Cyanide at 100 mg/L to FV 10 mL
② spiked 0.02 mL of 125-02-WCS14 (Lot# 94147, Source: ERA, Exp: 10/31/2018) with Free Cyanide at 100 mg/L to FV 50 mL
③ spiked 0.020 mL of 125-02-WCS14 (Lot# 94147, Source: ERA, Exp: 10/31/2018) with Free Cyanide at 100 mg/L to FV 50 mL

④ prepared in batch 20180718-P001
⑤ prepared in batch 20180716-P001

Comments:
Calibration Curve:

1 ppm CN std was prepared from 100 ppm CN std, 200uL of #125-02-WCS14 to final volume 20 mL with 0.25N NaOH

point (mg/L)	1 ppm (mL)	DI water (mL)	
0.5	5.0	5.0	
0.25	2.5	7.5	
0.1	1.0	9.0	
0.05	0.5	9.5	
0.01	0.1	9.9	
0.005	0.05	9.95	LLC

Note: sample #633804 & 633805, were titrated to verify normality of sample. Samples were adjusted with 10N NaOH and re-analyzed on following day 7/6/18 but samples still reflected a negative value under detection limit. Values from analysis on 7/5/18 were accepted and both reported as non-detects.

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

Amenable CN 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A010 (Ver. 1)
Status: CONSUMED

Analysis Method: Amenable Cyanide (TAP: 01-0406-134)
Analyte Test: Amenable CN 9012
Customer: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Project: 20859.01.00X
SDG: 633800
Reagent: 0.35M Calcium Hypochlorite #16-01-WCS14, 0.1N Sodium Arsenite #20-02-WCS14, KI paper #85038
Pipette: 5000-R, 1000-1, 200-3
Start Time: 07/05/2018 13:06:16

		Amenable Cyanide	
Sample Identification	Client Identification	Instrument Result (mg/L)	Final Result (mg/L)
PB18G18JH1	NA	0 U	0.00500 U
633800	B3JCT2	0 U	0.00500 U
633800D	B3JCT2	0 U	0.00500 U
633801	B3JCT6	0 U	0.00500 U
633802	B3JCV1	0 U	0.00500 U
633803	B3JCV5	0 U	0.00500 U
633804	B3JDB0	0 U	0.00500 U
633805	B3JDB1	0 U	0.00500 U
633806	B3JDB2	0 U	0.00500 U
633807	B3JDB3	0 U	0.00500 U
633808	B3JDC1	0 U	0.00500 U
633809	B3JDC2	0 U	0.00500 U
633812	B3JFH4	0 U	0.00500 U
633812D	B3JFH4	0 U	0.00500 U
633813	B3JFH5	0 U	0.00500 U
633814	B3JFK1	0 U	0.00500 U
633815	B3JFK2	0 U	0.00500 U
633834	B3JFK3	0 U	0.00500 U
633835	B3JFK4	0 U	0.00500 U

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

Amenable CN 9012

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180718-A010 (Ver. 1)
Status: CONSUMED

Analysis Method: Amenable Cyanide (TAP: 01-0406-134)
Analyte Test: Amenable CN 9012
Customer: CH2M Hill Plateau Remediation Company
Task Order: 180627-3
Project: 20859.01.00X
SDG: 633800
Reagent: 0.35M Calcium Hypochlorite #16-01-WCS14, 0.1N Sodium Arsenite #20-02-WCS14, KI paper #85038
Pipette: 5000-R, 1000-1, 200-3
Start Time: 07/05/2018 13:06:16

		Amenable Cyanide	
Sample Identification	Client Identification	Instrument Result (mg/L)	Final Result (mg/L)

Comments:
Batch is for Amenable Cyanide Summary. For run results and method performance please refer to batch #20180718-A007

Calculation:
Amenable Cyanide = Total Cyanide – Chlorinated Cyanide (CL)

Example: 633800

<0.005 mg/L – <0.005 mg/L = <0.005 mg/L

If no Amenable Cyanide is present, the RL for Total Cyanide is used for the Amenable Cyanide sample result.

Konelab CL sample results (mg/L):

PB	< 0.005
633800	< 0.005
633800D	< 0.005
633801	< 0.005
633802	< 0.005
633803	< 0.005
633804	< 0.005
633805	< 0.005
633806	< 0.005
633807	< 0.005
633808	< 0.005
633809	< 0.005
633812	< 0.005
633812D	< 0.005
633813	< 0.005
633814	< 0.005
633815	< 0.005
633834	< 0.005
633835	< 0.005

U - Result is less than the SwRI Reporting Limit (RL)

Prepared by: HERRERA, JUDY Date: 07/05/2018

Reviewed by: MOKEN, JAMES Date: 07/20/2018

010103

Calibration results AquaKem 6.5 Page: 1

Laboratory
Konelab User

05.07.2018 11:05

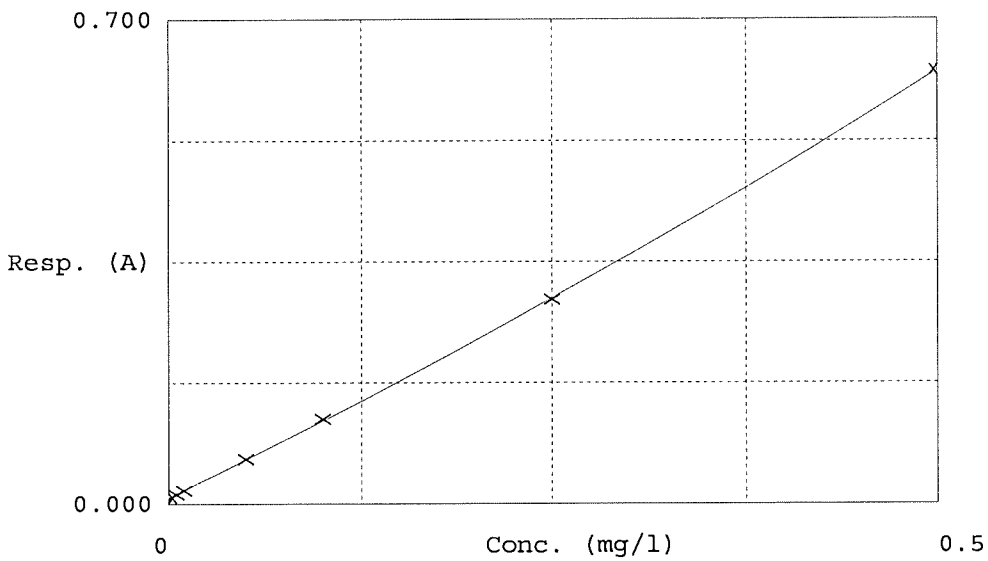
Test Cyanide

Accepted 05.07.2018 11:05

Resp. = A * Conc. ^ 2 + B * Conc. + C
A = 0.321
B = 1.072
C = 0.010

Coeff. of det. 0.999949

Errors



	Calibrator	Response	Calc. con.	Conc.	Errors
1	CN-0	0.009	-0.00058	0.00000	
2	CN-0.005	0.014	0.00407	0.00500	
3	CN-0.01	0.020	0.00949	0.01000	
4	CN-0.05	0.065	0.05090	0.05000	
5	CN-0.1	0.123	0.10254	0.10000	
6	CN-0.25	0.295	0.24827	0.25000	
7	CN-0.5	0.626	0.50029	0.50000	

#20180718-P001
20180718-A007 (tot.)
20180718-A008 (Free)
20180718-A009 (Amenable)
10 TS 7/18/18 gcu

Test results AquaKem 6.5 Page: 1

Laboratory
Konelab User

05.07.2018 17:25

Test: Cyanide

Sample Id	Result	Dil. 1 +	Response	Errors
CN-ICV DF2	0.6024	0.0	0.361	
CN-ICB	-0.0003	0.0	0.009	Test limit low
CN-LLC	0.0044	0.0	0.014	
633800	0.0000	0.0	0.010	
633800D	0.0002	0.0	0.010	
633800S	0.0608	0.0	0.076	
633801	0.0017	0.0	0.011	
633802	0.0056	0.0	0.016	
633803	0.0062	0.0	0.016	
633804	0.0004	0.0	0.010	
633805	-0.0007	0.0	0.009	Test limit low
633806	-0.0008	0.0	0.009	Test limit low
CN-CCV DF2	0.6053	0.0	0.363	
CN-CCB	-0.0003	0.0	0.009	Test limit low
633807	0.0004	0.0	0.010	
633808	0.0002	0.0	0.010	
633809	0.0014	0.0	0.011	
633810	-0.0002	0.0	0.009	Test limit low
633811	0.0052	0.0	0.015	
633812	-0.0002	0.0	0.009	Test limit low
633812D	-0.0007	0.0	0.009	Test limit low
633812S	0.0409	0.0	0.054	
633813	-0.0004	0.0	0.009	Test limit low
633814	0.0007	0.0	0.010	
CN-CCV2 DF2	0.6004	0.0	0.360	
CN-CCB2	-0.0004	0.0	0.009	Test limit low
633815	0.0010	0.0	0.011	
633834	-0.0006	0.0	0.009	Test limit low
633835	-0.0007	0.0	0.009	Test limit low
633800-F	-0.0005	0.0	0.009	Test limit low
633800D-F	-0.0019	0.0	0.008	Test limit low
633800S-F	-0.0006	0.0	0.009	Test limit low
633801-F	-0.0001	0.0	0.009	Test limit low
633802-F	0.0018	0.0	0.011	
633803-F	0.0024	0.0	0.012	
633804-F	-0.0053	0.0	0.004	Test limit low
CN-CCV3 DF2	0.6040	0.0	0.362	
CN-CCB3	-0.0005	0.0	0.009	Test limit low
633805-F	-0.0076	0.0	0.002	Test limit low
633806-F	-0.0193	0.0	-0.011	Test limit low
633807-F	-0.0136	0.0	-0.005	Test limit low
633808-F	-0.0035	0.0	0.006	Test limit low
633809-F	-0.0003	0.0	0.009	Test limit low
633812-F	-0.0001	0.0	0.009	Test limit low
633812D-F	-0.0008	0.0	0.009	Test limit low
633812S-F	0.0704	0.0	0.087	
633813-F	0.0376	0.0	0.050	
633814-F	-0.0008	0.0	0.009	Test limit low
CN-CCV4 DF2	0.6112	0.0	0.367	
CN-CCB4	-0.0004	0.0	0.009	Test limit low
633815-F	0.0013	0.0	0.011	
633834-F	0.0028	0.0	0.013	
633835-F	0.0002	0.0	0.010	
633800S-R	0.0412	0.0	0.054	
633802-R	0.0059	0.0	0.016	

Test results AquaKem 6.5 Page: 2

Laboratory
Konelab User

05.07.2018 17:25

Test: Cyanide

Sample Id	Result	Dil. 1 +	Response	Errors
633803-R	0.0063	0.0	0.016	
633811-R	0.0050	0.0	0.015	
633804-F R	-0.0110	0.0	-0.002	Test limit low
633800S-F R	0.0316	0.0	0.044	
633805-F R	-0.0052	0.0	0.004	Test limit low
CN-CCV5 DF2	0.6374	0.0	0.384	
CN-CCB5	-0.0004	0.0	0.009	Test limit low
633806-F R	0.0007	0.0	0.010	
633807-F R	-0.0019	0.0	0.008	Test limit low
633812S-F R	0.0124	0.0	0.023	
633813-F R	-0.0000	0.0	0.010	Test limit low
633800-C	-0.0008	0.0	0.009	Test limit low
633800D-C	-0.0008	0.0	0.009	Test limit low
633801-C	-0.0007	0.0	0.009	Test limit low
633802-C	0.0148	0.0	0.026	
633803-C	0.0005	0.0	0.010	
633804-C	0.0004	0.0	0.010	
CN-CCV6 DF2	0.6103	0.0	0.366	
CN-CCB6	0.0000	0.0	0.010	
633813S-F	0.0014	0.0	0.011	
633800S-C	-0.0005	0.0	0.009	Test limit low
633805-C	-0.0006	0.0	0.009	Test limit low
633806-C	-0.0006	0.0	0.009	Test limit low
633807-C	-0.0010	0.0	0.009	Test limit low
633808-C	-0.0003	0.0	0.009	Test limit low
633809-C	-0.0004	0.0	0.009	Test limit low
633812-C	-0.0003	0.0	0.009	Test limit low
633812D-C	-0.0006	0.0	0.009	Test limit low
633812S-C	-0.0005	0.0	0.009	Test limit low
CN-CCV7 DF2	0.6217	0.0	0.374	
CN-CCB7	-0.0002	0.0	0.009	Test limit low
633813-C	-0.0003	0.0	0.009	Test limit low
633814-C	-0.0004	0.0	0.009	Test limit low
633815-C	-0.0005	0.0	0.009	Test limit low
633834-C	-0.0008	0.0	0.009	Test limit low
633835-C	-0.0001	0.0	0.009	Test limit low
633802-C R	-0.0004	0.0	0.009	Test limit low
633802-S-F	0.0426	0.0	0.056	
PBW	-0.0003	0.0	0.009	Test limit low
LCSW DF2	0.5927	0.0	0.355	
LCSH	0.4660	0.0	0.579	
CN-CCV8 DF2	0.6082	0.0	0.365	
CN-CCB8	0.0005	0.0	0.010	
LCSL	0.0537	0.0	0.068	
CN-CCV9 DF2	0.6093	0.0	0.366	
CN-CCB9	-0.0003	0.0	0.009	Test limit low

010106

Test results AquaKem 6.5 Page: 3

Laboratory
Konelab User

05.07.2018 17:25

Test: Cyanide

Sample Id	Result	Dil. 1 +	Response

N	101
Mean	0.0747
SD	0.19392
CV%	259.70