

SOUTHWEST RESEARCH INSTITUTE®

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

April 20, 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:	S18-003, W18-003
	SDG Number:	629427
	SwRI Project Number:	20859.01.00X
	SwRI Task Order Number:	180320-7, 180321-6, 180323-3, 180328-8, 180330-6
	SwRI Sample Receipt Number:	61374, 61382, 61399, 61420, 61434
	Samples Received:	03.20.2018, 03.21.2018, 03.23.2018, 03.28.2018, 03.30.2018
	Fraction:	Dioxins by SW846 Method 8290A, and Cyanide Analyses

Dear Ms. Waters-Husted:

Please find the enclosed results for the fifteen (15) 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: jz
Encl



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

SOUTHWEST RESEARCH INSTITUTE**CLIENT: CH2M Hill Plateau Remediation Company****SwRI PROJECT#: 20859.01.00X****SwRI TASK ORDER: 180320-7, 180321-6, 180323-3,
180328-8, 180330-6****SwRI SRR: 61374, 61382, 61399, 61420, 61434****SDG: 629427****VTSR: 03.20.2018, 03.21.2018, 03.23.2018,
03.28.2018, 03.30.2018**

Chain-of-Custody & Sample Receipt Paperwork

Total Page Count: 010001-
Dioxin by
Fraction: SWR546 Pages: 010187
Method 8290A, & Cyanide Analyses

**CH2M Hill Plateau
Remediation Company**

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010002

C.O.C.#
W18-003-125

Page 1 of 22

Collector: Kevin Patterson CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, MARCH 2018	Logbook No.: HNF-N-506 - 97/75	Ice Chest No.: GWS-741
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 771775273982
Protocol: RCRA	Priority: 30 Days	Offsite Property No.: 9190

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
B3HK61	N	W	MAR 16 2018	1151	4x1-L aG	8290_DIOXINS_GCMS: COMMON	30/45 Days	Cool <=6C

CHPRC
SRR # 61374

SwRI Prjct # 20859.01.00X
TO: 180320-7

SDG # 629427



Relinquished By: Kevin Patterson CHPRC Signature: [Signature] Date/Time: MAR 16 2018 1215	Received By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 16 2018 1215	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 16 2018 1245	Received By: SSU-1 Signature: [Signature] Date/Time: MAR 16 2018 1245		
Relinquished By: SSU-1 Signature: [Signature] Date/Time: MAR 19 2018 0740	Received By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 19 2018 0740		
Relinquished By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 19 2018 1400	Received By: FEDEX Signature: [Signature] Date/Time: [Signature]		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

4/20/2018

REV.0

CH2M Hill Plateau Remediation Company

81 LBS

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

010004

C.O.C.# W18-003-126

Page 1 of 2

Collector: Kevin Patterson CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, MARCH 2018	Logbook No.: HNF-N-506 -97/75	Ice Chest No.: GWS-741
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 771775273982
Protocol: RCRA	Priority: 30 Days	Offsite Property No.: 9190

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
B3HK67	N		MAR 16 2018	0700	4x1-L aG	8290_DIOXINS_GCMS: COMMON	30/45 Days	Cool <=6C

CHPRC
SRR # 61374

SwRI Prjct # 20859.01.00X
TO: 180320-7

SDG # 629427

SWRI

Relinquished By: Kevin Patterson CHPRC MAR 16 2018 0810	Received By: Lesly Wall CHPRC MAR 16 2018 0810	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: Lesly Wall CHPRC MAR 16 2018 1430	Received By: SSU-1 MAR 16 2018 1430		
Relinquished By: SSU-1 MAR 19 2018 0740	Received By: Troy Bacon CHPRC MAR 19 2018 0740		
Relinquished By: Troy Bacon CHPRC MAR 19 2018 1400	Received By: FEDEX		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010006			C.O.C.# W18-003-127
					Page 1 of 1
Collector: Kevin Patterson CHPRC	Contact/Requester: Karen Waters-Husted		Telephone No.: 509-376-4650		
SAF No.: W18-003	Sampling Origin: Hanford Site		Purchase Order/Charge Code: 300071		
Project Title: RCRA, MARCH 2018	Logbook No.: HNF-N-506-97176		Ice Chest No.: 605-741		
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier		Bill of Lading/Air Bill No.: 771775273982		
Protocol: RCRA	Priority: 30 Days		Offsite Property No.: 9190		
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. B3HK68	Filter N	Date MAR 16 2018	Time 1300	No/Type Container 4x1-L aG	Sample Analysis 8290_DIOXINS_GCMS: COMMON
				Holding Time 30/45 Days	Preservative Cool <=6C

CHPRC
SRR # 61374
SDG # 629427

SwRI Prjct # 20859.01.00X
TO: 180320-7
SWRI

Relinquished By: Kevin Patterson CHPRC MAR 16 2018 1430	Received By: SSU-1 MAR 16 2018 1430	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: SSU-1 MAR 19 2018 0740	Received By: Troy Bacon CHPRC MAR 19 2018 0740		
Relinquished By: Troy Bacon CHPRC MAR 19 2018 1400	Received By: FEDEX		
Relinquished By: FED EX	Received By: David Garcia MAR 20 2018 08:45		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

CH2MHill Plateau
Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010007

C.O.C.#
W18-003-131

Page 1 of 12

Collector: Kevin Patterson CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, MARCH 2018	Logbook No.: HNF-N-506 - 97/75	Ice Chest No.: GWS-399
Shipped To (Lab): Southwest Research Institute	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.: 771775274165
Protocol RCRA	Priority: 30 Days	Offsite Property No.: 9190

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
B3HJN4	N		MAR 16 2018	0936	4x1-L aG	8290_DIOXINS_GCMS: COMMON	30/45 Days	Cool <=6C

CHPRC SRR # 61374
 SDG # 629427
 SwRI Prjct # 20859.01.00X
 TO: 180320-7
 SWRI

Relinquished By: Kevin Patterson CHPRC MAR 16 2018 10:00	Received By: Troy Bacon CHPRC MAR 16 2018 10:00	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: Troy Bacon CHPRC MAR 16 2018 10:25	Received By: SSU-1 MAR 16 2018 10:25	
Relinquished By: SSU-1 MAR 19 2018 07:40	Received By: Troy Bacon CHPRC MAR 19 2018 07:40	
Relinquished By: Troy Bacon CHPRC MAR 19 2018 14:00	Received By: FEDEX	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010009		C.O.C.# W18-003-132
Collector: Kevin Patterson <small>CHPRC</small>		Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650	
SAF No.: W18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071		
Project Title: RCRA, MARCH 2018	Logbook No.: HNF-N-506 - 97/75	Ice Chest No.: 6WS-399		
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 771775274165		
Protocol: RCRA	Priority: 30 Days	Offsite Property No.: 9190		

20.3/16/18

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
B3HJN9	N	W	MAR 16 2018	1031	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3HJN9	N	W	✓	✓	4x1-L aG	8290_DIOXINS_GCMS: COMMON	30/45 Days	Cool <=6C

CHPRC
 SRR # 61374
 SDG # 629427

SwRI Prjct # 20859.01.00X
 TO: 180320-7
 SWRI

Relinquished By: Kevin Patterson <small>CHPRC</small> <i>[Signature]</i> MAR 16 2018 1105	Received By: Troy Bacon <small>CHPRC</small> <i>[Signature]</i> MAR 16 2018 1105	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: Troy Bacon <small>CHPRC</small> <i>[Signature]</i> MAR 16 2018 1145	Received By: SSU-1 <i>[Signature]</i> MAR 16 2018 1145		
Relinquished By: SSU-1 <i>[Signature]</i> MAR 19 2018 0740	Received By: Troy Bacon <small>CHPRC</small> <i>[Signature]</i> MAR 19 2018 0740		
Relinquished By: Troy Bacon <small>CHPRC</small> <i>[Signature]</i> MAR 19 2018 1400	Received By: FEDEX <i>[Signature]</i>		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

010010

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

C.O.C. No. W18-003-132
Page 2 of 2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
		<u>FED EX</u>		<u>David Garcia</u>		<u>David Garcia</u>	<u>03-20-2018 08:45</u>
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
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

4/20/2018

REV.0

CH2M Hill Plateau Remediation Company

68 LBS

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010011

C.O.C.# W18-003-227

Page 1 of 2

20.3.16/18

Collector: Kevin Patterson CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, MARCH 2018	Logbook No.: HNF-N-506-97/75	Ice Chest No.: GWS-399
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 771775274165
Protocol: RCRA	Priority: 30 Days	Offsite Property No.: 9190

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
B3HL16	N	W	MAR 16 2018	1151	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
 SRR # 61374
 SDG # 629427

SwRI Prjct # 20859.01.00X
 IO: 180320-7

Relinquished By: Kevin Patterson CHPRC Signature: [Signature] Date/Time: MAR 16 2018 1215	Received By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 16 2018 1215	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 16 2018 1245	Received By: SSU-1 Signature: [Signature] Date/Time: MAR 16 2018 1245		
Relinquished By: SSU-1 Signature: [Signature] Date/Time: MAR 19 2018 0140	Received By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 19 2018 0140		
Relinquished By: Troy Bacon CHPRC Signature: [Signature] Date/Time: MAR 19 2018 1400	Received By: FEDEX Signature: [Signature] Date/Time: [Signature]		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

CH2M Hill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010013	C.O.C. # S18-003-445	Page 1 of 1
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Collector: Kevin Patterson CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: S18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: CERCLA, MARCH 2018	Logbook No.: HNF-N-506-18-61	Ice Chest No.: GWS-475
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 77179192585
Protocol: CERCLA	Priority: 30 Days	Offsite Property No.: 9201

POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	SPECIAL INSTRUCTIONS N/A
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3HL78	N	W	3-20-18	1122	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
 SRR # 61382
 SDG # 629427

SwRI Prjct # 20859.01.00X
 TO: 180321-6
SWRI

Relinquished By: Print First and Last Name: Daniel Klug Signature: Date/Time: MAR 20 2018 1225	Received By: Daniel Klug Print First and Last Name: Daniel Klug Signature: Date/Time: MAR 20 2018 1225	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: Daniel Klug Print First and Last Name: Daniel Klug Signature: Date/Time: MAR 20 2018 1400	Received By: FEDEX Print First and Last Name: FEDEX Signature: Date/Time:	
Relinquished By: FED EX Print First and Last Name: FED EX Signature: Date/Time:	Received By: David Garcia Print First and Last Name: David Garcia Signature: Date/Time: 03-21-2018 10:20	
Relinquished By:	Received By:	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			010014 C.O.C.# S18-003-448	Page 1 of 1		
Collector: Frank Hall / CHPRC		Contact/Requester: Karen Waters-Husted		Telephone No.: 509-376-4650				
SAF No.: S18-003		Sampling Origin: Hanford Site		Purchase Order/Charge Code: 300071				
Project Title: CERCLA, MARCH 2018		Logbook No.: HNF-N-506-99-19		Ice Chest No.: 6ws-475				
Shipped To (Lab): Southwest Research Institute		Method of Shipment: Commercial Carrier		Bill of Lading/Air Bill No.: 7717 91925585				
Protocol: CERCLA		Priority: 30 Days		Offsite Property No.: 9201				
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
B3HL81	N	W	MAR 20 2018	0954	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61382
SDG # 629427

SwRI Prjct # 20859.01.00X
TO: 180321-6
SWRI

Relinquished By: Frank Hall / CHPRC Signature: [Signature] Date/Time: MAR 20 2018 0920		Received By: Daniel Klug / CHPRC Signature: [Signature] Date/Time: MAR 20 2018		Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other				
Relinquished By: Daniel Klug / CHPRC Signature: [Signature] Date/Time: MAR 20 2018 1400		Received By: FEDEX Signature: [Signature] Date/Time:						
Relinquished By: FED Ex Signature: [Signature] Date/Time:		Received By: Daniel Garcia / Daniel Garcia Signature: [Signature] Date/Time: 03-21-2018 10:20						
Relinquished By: Signature: [Signature] Date/Time:		Received By: Signature: [Signature] Date/Time:						
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process):			Disposed By:		Date/Time:	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			010015	C.O.C.# S18-003-449	Page 1 of 1	
Collector: Frank Hall JCHPRC	Contact/Requester: Karen Waters-Husted			Telephone No.: 509-376-4650				
SAF No.: S18-003	Sampling Origin: Hanford Site			Purchase Order/Charge Code: 300071				
Project Title: CERCLA, MARCH 2018	Logbook No.: HNF-N-506-99-19			Ice Chest No.: GWS-475				
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier			Bill of Lading/Air Bill No.: 771791925885				
Protocol: CERCLA	Priority: 30 Days			Offsite Property No.: 9201				
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. B3HL82	Filter N	* W	Date MAR 20 2018	Time 0920	No/Type Container 1x250-mL aG	Sample Analysis 9012_CYANIDE (TOTAL): COMMON	Holding Time 14 Days	Preservative NaOH to pH >=12 / Cool <=6C

CHPRC SRR # 61382
 SDG # 629427
 SwRI Prjct # 20859.01.00X
 TO: 180321-6
 SWRI

Relinquished By: Frank Hall JCHPRC Print First and Last Name Signature Date/Time	MAR 20 2018 0920	Received By: Daniel Klug CHPRC Print First and Last Name Signature Date/Time	MAR 20 2018 0920	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: Daniel Klug CHPRC Print First and Last Name Signature Date/Time	MAR 20 2018 1400	Received By: FEDEX Print First and Last Name Signature Date/Time	(Signature) (Date/Time)	
Relinquished By: FEDEX Print First and Last Name Signature Date/Time	(Signature) (Date/Time)	Received By: David Garcia David Garcia Print First and Last Name Signature Date/Time	03-21-2018 10:20	
Relinquished By: Print First and Last Name Signature Date/Time	(Signature) (Date/Time)	Received By: Print First and Last Name Signature Date/Time	(Signature) (Date/Time)	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	Date/Time:

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010016		C.O.C. # S18-003-457
				Page 1 of 1
Collector: Jeff Lucas /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650		
SAF No.: S18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071		
Project Title: CERCLA, MARCH 2018	Logbook No.: HNF-N-506 99 / 21	Ice Chest No.: 6W5-697		
Shipped To (Lab): Southwest Research Institute	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.: 771814615503		
Protocol CERCLA	Priority: 30 Days	Offsite Property No.: 9218		

POSSIBLE SAMPLE HAZARDS/REMARK ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	SPECIAL INSTRUCTIONS N/A
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Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3HFP8	N	W	MAR 22 2018	0700	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC SRR # 61399
 SDG # 629427
 SwRI Prjct # 20859.01.00X
 TO: 180323-3


Relinquished By: Jeff Lucas /CHPRC Print First and Last Name Signature Date/Time MAR 22 2018 1130	Received By: Lesly Wall /CHPRC Print First and Last Name Signature Date/Time MAR 22 2018 1130	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: Lesly Wall /CHPRC Print First and Last Name Signature Date/Time MAR 22 2018 1400	Received By: FEDEX Print First and Last Name Signature Date/Time	
Relinquished By: FEO EX Print First and Last Name Signature Date/Time	Received By: David Garcia /CHPRC Print First and Last Name Signature Date/Time 03-23-2018 08:50	
Relinquished By: Print First and Last Name Signature Date/Time	Received By: Print First and Last Name Signature Date/Time	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:
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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 010017			C.O.C. # S18-003-446			
					Page 1 of 1			
Collector: Jeff Lucas /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650						
SAF No.: S18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071						
Project Title: CERCLA, MARCH 2018	Logbook No.: HNF-N-506 99/21	Ice Chest No.: 6005-6917						
Shipped To (Lab): Southwest Research Institute	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.: 7718 1461 5503						
Protocol CERCLA	Priority: 30 Days	Offsite Property No.: 9218						
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
B3HL80	N	W	MAR 22 2018	0030	1x250-mL aG	9012_CYANIDE (TOTAL) : COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61399
SDG # 629427

SwRI Prjct # 20859.01.00X
TO: 180323-3

SWRI

Relinquished By: Jeff Lucas /CHPRC MAR 22 2019 1130	Received By: Lesly Wall /CHPRC MAR 22 2019 1130	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: Lesly Wall /CHPRC MAR 22 2019 1400	Received By: FEDEX		
Relinquished By: FEDEX	Received By: David Garcia /CHPRC 03-23-2018 08:50		
Relinquished By:	Received By:		
Print First and Last Name Signature Date/Time	Print First and Last Name Signature Date/Time		
Print First and Last Name Signature Date/Time	Print First and Last Name Signature Date/Time		
Print First and Last Name Signature Date/Time	Print First and Last Name Signature Date/Time		
Print First and Last Name Signature Date/Time	Print First and Last Name Signature Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			18/65 010018		C.O.C.# S18-003-453	
Collector: Jeff Lucas ICHPRC		Contact/Requester: Karen Waters-Husted			Telephone No.: 509-376-4650			
SAF No.: S18-003		Sampling Origin: Hanford Site			Purchase Order/Charge Code: 300071			
Project Title: CERCLA, MARCH 2018		Logbook No.: HNF-N-506 99/21			Ice Chest No.: 605-697			
Shipped To (Lab): Southwest Research Institute		Method of Shipment Commercial Carrier			Bill of Lading/Air Bill No.: 7718146/5503			
Protocol CERCLA		Priority: 30 Days			Offsite Property No.: 9218			
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
B3HL89	N	W	MAR 22 2018	0840	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61399

SDG # 629427

SwRI Proj # 20859.01.00X
TO: 180323-3

SWRI

Relinquished By: Jeff Lucas ICHPRC MAR 22 2019 1130	Received By: Lesty Wall ICHPRC MAR 22 2019 1130	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: Lesty Wall ICHPRC MAR 22 2019 1400	Received By: FEDEX		
Relinquished By: FEDEX	Received By: David Garcia David Garcia 03232018 08:50		
Relinquished By:	Received By:		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

**CH2MHill Plateau
Remediation Company**

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

010019

C.O.C.#
W18-003-100

Page 1 of 1

Collector: Juan Aguilar /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, MARCH 2018	Logbook No.: HNF-N-506-98/65	Ice Chest No.: 605-703
Shipped To (Lab): Southwest Research Institute	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 771848038296
Protocol: RCRA	Priority: 30 Days	Offsite Property No.: 9226

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
B3HKH6	Y	W	3-27-18	0837	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C
B3HKH5	N	W	3-27-18	0837	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC
SRR # 61420
SDG # 629427

SwRI Prjct # 20859.01.00X
TG: 180328-8



Relinquished By: Juan Aguilar /CHPRC Signature: [Signature] Date/Time: MAR 27 2018 0910	Received By: SSU-1 Signature: [Signature] Date/Time: MAR 27 2018 0910	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other	
Relinquished By: SSU-1 Signature: [Signature] Date/Time: MAR 27 2018 1130	Received By: Leahy Wall /CHPRC Signature: [Signature] Date/Time: MAR 27 2018 1130		
Relinquished By: Leahy Wall /CHPRC Signature: [Signature] Date/Time: MAR 27 2018 1400	Received By: FEDEX Signature: [Signature] Date/Time: [Signature]		
Relinquished By: FED EX Signature: [Signature] Date/Time: [Signature]	Received By: David Garcia /CHPRC Signature: [Signature] Date/Time: 03282018 09:15		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

4/20/2018

REV.0

CH2M Hill Plateau Remediation Company

15 LBS

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

010020

C.O.C.# S18-003-459

Page 1 of 2

Collector: Juan Aguilar /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: S18-003	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: CERCLA, MARCH 2018	Logbook No.: HNF-N-506 - 98164	Ice Chest No.: GWS-712
Shipped To (Lab): Southwest Research Institute	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.: 7718 6743 4963
Protocol CERCLA	Priority: 30 Days	Offsite Property No.: 9232

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
B3HFT4	N	W	3-28-18	0836	1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12 / Cool <=6C

CHPRC SRR # 61434
 SwRI Prjct # 20859.01.00X TO: 180330-6
 SDG # 629427

Relinquished By: Juan Aguilar /CHPRC Signature: [Signature] Date/Time: MAR 28 2018 0516	Received By: Tim Callaway /CHPRC Signature: [Signature] Date/Time: MAR 28 2018 0916	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquid SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By: Tim Callaway /CHPRC Signature: [Signature] Date/Time: MAR 28 2018 0933	Received By: SSU-1 Signature: [Signature] Date/Time: MAR 28 2018 0933	
Relinquished By: SSU-1 Signature: [Signature] Date/Time: MAR 29 2018 0700	Received By: Troy Bacon /CHPRC Signature: [Signature] Date/Time: MAR 29 2018 0700	
Relinquished By: Troy Bacon /CHPRC Signature: [Signature] Date/Time: MAR 29 2018 1400	Received By: FEDEX Signature: [Signature] Date/Time: [Signature]	

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

Laboratory Task Order

TO #: 180320-7 Revision: 5

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 04/16/18
 Client(s): CH2M Hill Plateau Remediation Company

SDG: 629427
 VTSR: 03/20/18
 SAF: W18-003

SRR #'s: 61374
 Client(s): CH2M Hill Plateau Remediation Company

Instructions

CH2MHill Plateau Remediation Company. 300071
 SAF No. W18-003

SDG 629427 is open until 04/03/18

30-day TAT.
 FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 04/17/2018.

6 overall samples (22 containers) were received on 03/20/2018, which are listed here.

Sample Analysis REQUIRED
 9012 _ 57-12-5 Cyanide (Total)
 8290 _ DIOXINS_GCMS

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

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

Electronic copies of all sample receipt information, COCs, priority data packages, final data packages, corrected/revised data packages, closure reports, status reports, invoices, etc. shall be sent to: mailto:CPP_Sample_Management@rl.gov

REVISION 1, DRmz 03/20/18: Task Order revised to correct the Instructions.
 REVISION 2, DRmz 03/21/18: Task Order revised to indicate additional samples were received on 03/21/18, which have been grouped with SDG 629427, located in Task Order # 180321-6, SRR 61382.
 REVISION 3, DRmz 03/23/18: Task Order revised to indicate additional samples were received on 03/23/18, which have been grouped with SDG 629427, located in Task Order # 180323-3, SRR 61399.
 REVISION 4, DRmz 03/28/18: Task Order revised to indicate additional samples were received on 03/28/18, which have been grouped with SDG 629427, located in Task Order # 180328-8, SRR 61420.
 REVISION 5, DRmz 03/30/18: Task Order revised to indicate an additional sample was received on 03/30/18, which has been grouped with SDG 629427, located in Task Order # 180330-6, SRR 61434.

Documents Related to this task order: 239866[COC for SRR 61374], 239867[Paperwork for SRR 61374]

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

Test: CN_9012
 Section: WETCHEM

Holding: 14 days from CED

Cyanide by Method 9012 (Automated)

Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629428		1-9012	Water	B3HJN9	16 Mar 18	30 Mar 18
629431		1	Water	B3HL16	16 Mar 18	30 Mar 18

Test: D8290A
 Section: DIOXIN

Holding: 45 days from E8290W

Analysis for SW-846 Method 8290A

Cnt: 5

System ID	Type	Cont	Matrix	Customer ID	N/A	Method Date
629427		1	Water	B3HJN4	-	Unknown
629427		2	Water	B3HJN4	-	Unknown
629427		3	Water	B3HJN4	-	Unknown
629427		4	Water	B3HJN4	-	Unknown
629428		2-8290	Water	B3HJN9	-	Unknown
629428		3-8290	Water	B3HJN9	-	Unknown
629428		4-8290	Water	B3HJN9	-	Unknown



Southwest Research Institute

Laboratory Task Order

TO #: 180320-7 Revision: 5

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 04/16/18

SDG: 629427
 VTSR: 03/20/18
 SAF: W18-003

SRR #s: 61374

Client(s): CH2M Hill Plateau Remediation Company

System ID	Type	Cont	Matrix	Customer ID	N/A	Method Date
629428		5-8290	Water	B3HJN9	-	Unknown
629429		1	Water	B3HK67	-	Unknown
629429		2	Water	B3HK67	-	Unknown
629429		3	Water	B3HK67	-	Unknown
629429		4	Water	B3HK67	-	Unknown
629430		1	Water	B3HK68	-	Unknown
629430		2	Water	B3HK68	-	Unknown
629430		3	Water	B3HK68	-	Unknown
629430		4	Water	B3HK68	-	Unknown
629441		1	Water	B3HK61	-	Unknown
629441		2	Water	B3HK61	-	Unknown
629441		3	Water	B3HK61	-	Unknown
629441		4	Water	B3HK61	-	Unknown

Test: E8290W
 Section: EXTLAB

Holding: 30 days from CED

EXTRACTION FOR METHOD 8290

Cnt: 5

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629427		1	Water	B3HJN4	16 Mar 18	15 Apr 18
629427		2	Water	B3HJN4	16 Mar 18	15 Apr 18
629427		3	Water	B3HJN4	16 Mar 18	15 Apr 18
629427		4	Water	B3HJN4	16 Mar 18	15 Apr 18
629428		2-8290	Water	B3HJN9	16 Mar 18	15 Apr 18
629428		3-8290	Water	B3HJN9	16 Mar 18	15 Apr 18
629428		4-8290	Water	B3HJN9	16 Mar 18	15 Apr 18
629428		5-8290	Water	B3HJN9	16 Mar 18	15 Apr 18
629429		1	Water	B3HK67	16 Mar 18	15 Apr 18
629429		2	Water	B3HK67	16 Mar 18	15 Apr 18
629429		3	Water	B3HK67	16 Mar 18	15 Apr 18
629429		4	Water	B3HK67	16 Mar 18	15 Apr 18
629430		1	Water	B3HK68	16 Mar 18	15 Apr 18
629430		2	Water	B3HK68	16 Mar 18	15 Apr 18
629430		3	Water	B3HK68	16 Mar 18	15 Apr 18
629430		4	Water	B3HK68	16 Mar 18	15 Apr 18
629441		1	Water	B3HK61	16 Mar 18	15 Apr 18
629441		2	Water	B3HK61	16 Mar 18	15 Apr 18
629441		3	Water	B3HK61	16 Mar 18	15 Apr 18
629441		4	Water	B3HK61	16 Mar 18	15 Apr 18



Southwest Research Institute

Laboratory Task Order

TO #: 180321-6 Revision: 3

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 04/16/18

SDG: 629427
 VTSR: 03/21/18
 CASE: CHPRC

SRR #s: 61382
 Client(s): CH2M Hill Plateau Remediation Company

Instructions

CH2MHill Plateau Remediation Company. 300071
 SAF No. S18-003

SDG 629427 is open until 04/03/18

GROUPED _ with samples in SDG 629427, located in Task Order # 180320-7, SRR 61374.

30-day TAT.

FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 04/17/2018.

4 overall samples (4 containers) were received on 03/21/2018.

OUT of the 4 samples, ONLY the 3 samples that require Cn are listed here.

Sample Analysis REQUIRED

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

REVISION 1, DRmz 03/23/18: Task Order revised to indicate additional samples were received on 03/23/18, which have been grouped with SDG 629427, located in Task Order # 180323-3, SRR 61399.

REVISION 2, DRmz 03/28/18: Task Order revised to indicate additional samples were received on 03/28/18, which have been grouped with SDG 629427, located in Task Order # 180328-8, SRR 61420.

REVISION 3, DRmz 03/30/18: Task Order revised to indicate an additional sample was received on 03/30/18, which has been grouped with SDG 629427, located in Task Order # 180330-6, SRR 61434.

Documents Related to this task order: 239917[COC for SRR 61382], 239918[Paperwork for SRR 61382]

Deliverables --> Hard Copy: -YES- EDD: -YES- PDF: -YES-

Test: CN_9012

Holding: 14 days from CED

Section: WETCHEM

Cyanide by Method 9012 (Automated)

Cnt: 3

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629454		1	Water	B3HL78	20 Mar 18	03 Apr 18
629455		1	Water	B3HL81	20 Mar 18	03 Apr 18
629456		1	Water	B3HL82	20 Mar 18	03 Apr 18



Southwest Research Institute

Laboratory Task Order

TO #: 180323-3 Revision: 2

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 04/16/18
 Client(s): CH2M Hill Plateau Remediation Company

SDG: 629427
 VTSR: 03/23/18
 CASE: CHPRC

SRR #s: 61399
 Client(s): CH2M Hill Plateau Remediation Company

Instructions

CH2MHill Plateau Remediation Company. 300071
 SAF No. S18-003

SDG 629427 is open until 04/03/18

GROUPED _ with samples in SDG 629427, located in Task Order # 180320-7, SRR 61374; Task Order # 180321-6, SRR 61382

30-day TAT.
 FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 04/17/2018.

3 overall samples (3 containers) were received on 03/23/2018, which are ALL listed here.

Sample Analysis REQUIRED
 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

REVISION 1, DRmz 03/28/18: Task Order revised to indicate additional samples were received on 03/28/18, which have been grouped with SDG 629427, located in Task Order # 180328-8, SRR 61420.

REVISION 2, DRmz 03/30/18: Task Order revised to indicate an additional sample was received on 03/30/18, which has been grouped with SDG 629427, located in Task Order # 180330-6, SRR 61434.

Documents Related to this task order: 240032[COC for SRR 61399], 240033[Paperwork for SRR 61399]

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

Test: CN_9012
 Section: WETCHEM

Holding: 14 days from CED

Cyanide by Method 9012 (Automated)

Cnt: 3

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629564		1	Water	B3HFPB	22 Mar 18	05 Apr 18
629565		1	Water	B3HL80	22 Mar 18	05 Apr 18
629566		1	Water	B3HL89	22 Mar 18	05 Apr 18



Southwest Research Institute

Laboratory Task Order

TO #: 180328-8 Revision: 1

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 04/16/18
 Client(s): CH2M Hill Plateau Remediation Company

SDG: 629427
 VTSR: 03/28/18
 CASE: CHPRC

Instructions

CH2MHill Plateau Remediation Company. 300071
 SAF No. W18-003

SDG 629427 is open until 04/03/18

GROUPED _ with samples in SDG 629427, located in Task Order # 180320-7, SRR 61374; Task Order # 180321-6, SRR 61382; Task Order # 180323-3, SRR 61399.

30-day TAT.
 FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 04/17/2018.

3 overall samples (4 containers) were received on 03/28/2018.
 OUT of the 3 samples, only the 2 samples that require CN are listed here.

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
 REVISION 1, DRmz 03/30/18: Task Order revised to indicate an additional sample was received on 03/30/18, which has been grouped with SDG 629427, located in Task Order # 180330-6, SRR 61434.

Documents Related to this task order: 240227[COC for SRR 61420], 240228[Paperwork for SRR 61420]

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

Test: AMENCN_9012
 Section: WETCHEM

Holding: 14 days from CED

Amenable Cyanide by SW846 9012

Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629662		1	Water	B3HKH5	27 Mar 18	10 Apr 18
629663		1	Water	B3HKH6	27 Mar 18	10 Apr 18

Test: CN_9012
 Section: WETCHEM

Holding: 14 days from CED

Cyanide by Method 9012 (Automated)

Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629662		1	Water	B3HKH5	27 Mar 18	10 Apr 18
629663		1	Water	B3HKH6	27 Mar 18	10 Apr 18

Test: CN_9014
 Section: WETCHEM

Holding: 14 days from CED

FREE Cyanide by SW846 9014

Cnt: 2

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629662		1	Water	B3HKH5	27 Mar 18	10 Apr 18



Southwest Research Institute

Laboratory Task Order

TO #: 180328-8 Revision: 1

Project(s): 20859.01.00X
Manager(s): SPIES, RADONNA
To Client: 04/16/18

SDG: 629427
VTSR: 03/28/18
CASE: CHPRC

SRR #'s: 61420
Client(s): CH2M Hill Plateau Remediation Company

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629663		1	Water	B3HKH6	27 Mar 18	10 Apr 18



Southwest Research Institute

Laboratory Task Order

TO #: 180330-6 Revision: 0

Project(s): 20859.01.00X
 Manager(s): SPIES, RADONNA
 To Client: 04/16/18
 Client(s): CH2M Hill Plateau Remediation Company

SDG: 629427
 VTSR: 03/30/18
 CASE: CHPRC

Instructions

CH2MHill Plateau Remediation Company. 300071
 SAF No. S18-003

SDG 629427 is open until 04/03/18

GROUPED _ with samples in SDG 629427, located in Task Order # 180320-7, SRR 61374; Task Order # 180321-6, SRR 61382; Task Order # 180323-3, SRR 61399; Task Order # 180328-8, SRR 61420.

30-day TAT.
 FINAL DATA/HARDCOPY IS DUE TO THE CLIENT ON 04/17/2018.

1 overall sample (1 container) was received on 03/30/2018, which is listed here.

Sample Analysis REQUIRED
 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: 240323[COC for SRR 61434], 240324[Paperwork for SRR 61434]

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

Test: CN_9012
 Section: WETCHEM

Holding: 14 days from CED

Cyanide by Method 9012 (Automated)

Cnt: 1

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
629837		1	Water	B3HFT4	28 Mar 18	11 Apr 18



Sample Receipt

Southwest Research Institute

VTSR: 03/20/18

Time: 08:45:00

Project: 20859.01.00X
Case #: W18-003
Client: CH2M Hill Plateau Remediation Company

Sample Receipt Number: 61374

Manager: SPIES, RADONNA
Logged in by: DXGARCIA
Creation Date: 03/20/18

Notes

Samples were received intact,

Fed Ex Tracking #(s):

7717 7527 3982_ 2.1°C (wet ice)

7717 7527 4165_ 2.0°C (wet ice)

pH Test Paper 0.0- 13.0

Lot - 230016

Exp: 10/30/2019

Ice Chest No.:

GWS-399

GWS-741

Test requirements located on the applicable Task Order.

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

ALL SAMPLE CONTAINERS / APPLICABLE ITEMS WERE RECEIVED OK.

Background CPM: <150 cpm
Container Wipe CPM: <150 cpm
Total CPM: <150

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
629427	B3HJN4	03/16/18	Water	4	
629428	B3HJN9	03/16/18	Water	5	
629441	B3HK61	03/16/18	Water	4	
629429	B3HK67	03/16/18	Water	4	
629430	B3HK68	03/16/18	Water	4	
629431	B3HL16	03/16/18	Water	1	

Containers: 22

Samples: 6

These documents are associated with this receipt: 239866[COC for SRR 61374], 239867[Paperwork for SRR 61374]

Thermometer: 021056
Temperature: NOTE

61374 CH2M Hill Plateau Remediation

Sample Receipt

Southwest Research Institute

Sample Receipt Number: 61382

VTSR: 03/21/18

Time: 10:20:00

Project: 20859.01.00X
Case #: CHPRC
Client: CH2M Hill Plateau Remediation Company

Manager: SPIES, RADONNA
Logged in by: DXGARCIA
Creation Date: 03/21/18

Notes

Samples were received intact,

Fed Ex Tracking #(s):
7717 9192 5585_ 1.5°C (wet ice)

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

Ice Chest No.:
GWS-475

Test requirements located on the applicable Task Order.

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

ALL SAMPLE CONTAINERS / APPLICABLE ITEMS WERE RECEIVED OK.

Background CPM: <150 cpm
Container Wipe CPM: <150 cpm
Total CPM: <150

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
629453	B3FW34	03/20/18	Water	1	
629454	B3HL78	03/20/18	Water	1	
629455	B3HL81	03/20/18	Water	1	
629456	B3HL82	03/20/18	Water	1	

Containers: 4

Samples: 4

These documents are associated with this receipt: 239917[COC for SRR 61382], 239918[Paperwork for SRR 61382]

Thermometer: 021056
Temperature: 1.5

61382 CH2M Hill Plateau Remediation

Sample Receipt

Southwest Research Institute

VTSR: 03/23/18

Time: 08:50:00

Project: 20859.01.00X

Sample Receipt Number: 61399

Manager: SPIES, RADONNA

Case #: S18-003

Logged in by: DXGARCIA

Client: CH2M Hill Plateau Remediation Company

Creation Date: 03/23/18

Notes

Samples were received intact,

Fed Ex Tracking #(s):

7718 1461 5503_ 1.9°C (wet ice)

pH Test Paper 0.0- 13.0

Lot - 230016

Exp: 10/30/2019

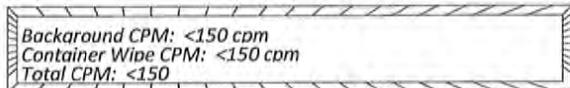
Ice Chest No.:

GWS-697

Test requirements located on the applicable Task Order.

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

ALL SAMPLE CONTAINERS / APPLICABLE ITEMS WERE RECEIVED OK.



System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
629564	B3HFP8	03/22/18	Water	1	
629565	B3HL80	03/22/18	Water	1	
629566	B3HL89	03/22/18	Water	1	

Containers: 3

Samples: 3

These documents are associated with this receipt: 240032[COC for SRR 61399], 240033[Paperwork for SRR 61399]

Thermometer: 021056
Temperature: 1.9

61399 CH2M Hill Plateau Remediation

Sample Receipt

Southwest Research Institute

VTSR: 03/28/18

Time: 09:15:00

Project: 20859.01.00X
 Case #: CHPRC
 Client: CH2M Hill Plateau Remediation Company

Sample Receipt Number: 61420

Manager: SPIES, RADONNA
 Logged in by: DXGARCIA
 Creation Date: 03/28/18

Notes

Samples were received intact,

Fed Ex Tracking #(s):
 7718 4803 8296_ 1.8°C (wet ice)

pH Test Paper 0.0- 3.0
 Lot - 2303015
 Exp: 10/30/2018

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

Ice Chest No.:
 GWS-703

Test requirements located on the applicable Task Order.

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

ALL SAMPLE CONTAINERS / APPLICABLE ITEMS WERE RECEIVED OK.

Background CPM: <150 cpm
 Container Wipe CPM: <150 cpm
 Total CPM: <150

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
629661	B3F8F3	03/26/18	Water	2	
629662	B3HKH5	03/27/18	Water	1	
629663	B3HKH6	03/27/18	Water	1	

Containers: 4

Samples: 3

These documents are associated with this receipt: 240227[COC for SRR 61420], 240228[Paperwork for SRR 61420]

Thermometer: 021056
 Temperature: 1.8

61420 CH2M Hill Plateau Remediation

Sample Receipt

Southwest Research Institute

VTSR: 03/30/18

Time: 08:45:00

Project: 20859.01.00X

Sample Receipt Number: 61434

Manager: SPIES, RADONNA

Case #: S18-003

Logged in by: DXGARCIA

Client: CH2M Hill Plateau Remediation Company

Creation Date: 03/30/18

Notes

Samples were received intact,

Fed Ex Tracking #(s):
7718 6743 4963_ 1.8°C (wet ice)

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

Ice Chest No.:
GWS-712

Test requirements located on the applicable Task Order.

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

ALL SAMPLE CONTAINERS / APPLICABLE ITEMS WERE RECEIVED OK.

Background CPM: <150 cpm
Container Wipe CPM: <150 cpm
Total CPM: <150

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
629837	B3HFT4	03/28/18	Water	1	

Containers: 1

Samples: 1

These documents are associated with this receipt: 240323[COC for SRR 61434], 240324[Paperwork for SRR 61434]

Thermometer: 021056
Temperature: 1.8

61434 CH2M Hill Plateau Remediation

Southwest Research Institute
Traffic Report

Sample Custodian Signature: David Garcia



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

Client: CH2M Hill Plateau Remediation Company

Project: 20859.01.00X

Case: W18-003 / SDG: SEE TO

Sample Receipt: 61374

Airbill: 771775273982,771775274165

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
03/20/18	08:45:00	W18-003-131	B3HJN4	N/A	629427	YES	Intact
03/20/18	08:45:00	W18-003-132	B3HJN9	N/A	629428	YES	Intact
03/20/18	08:45:00	W18-003-126	B3HK67	N/A	629429	YES	Intact
03/20/18	08:45:00	W18-003-127	B3HK68	N/A	629430	YES	Intact
03/20/18	08:45:00	W18-003-227	B3HL16	N/A	629431	YES	Intact
03/20/18	08:45:00	W18-003-125	B3HK61	N/A	629441	YES	Intact

Southwest Research Institute
Traffic Report

Sample Custodian Signature: Daniel Garcia



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

Client: CH2M Hill Plateau Remediation Company
 Project: 20859.01.00X
 Case: CHPRC / SDG: SEE TO
 Sample Receipt: 61382
 Airbill: 7717 9192 5585

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
03/21/18	10:20:00	S18-001-090	B3FW34	N/A	629453	YES	Intact
03/21/18	10:20:00	S18-003-445	B3HL78	N/A	629454	YES	Intact
03/21/18	10:20:00	S18-003-448	B3HL81	N/A	629455	YES	Intact
03/21/18	10:20:00	S18-003-449	B3HL82	N/A	629456	YES	Intact

Southwest Research Institute
Traffic Report

Sample Custodian Signature: David Yamin



- 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: S18-003 / SDG: See T.O.

Sample Receipt: 61399

Airbill: 7718 1461 5503

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
03/23/18	08:50:00	S18-003-457	B3HFP8	N/A	629564	YES	Intact
03/23/18	08:50:00	S18-003-446	B3HL80	N/A	629565	YES	Intact
03/23/18	08:50:00	S18-003-453	B3HL89	N/A	629566	YES	Intact

Southwest Research Institute

Traffic Report

Sample Custodian Signature: David Garcia



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

Client: CH2M HILL Plateau Remediation Company

Project: 20859.01.00X

Case: CHPRC / SDG: SEE 70

Sample Receipt: 61420

Airbill: 7718 4803 8296

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
03/28/18	09:15:00	S18-011-256	B3F8F3	N/A	629661	YES	Intact
03/28/18	09:15:00	W18-003-100	B3HKH5	N/A	629662	YES	Intact
03/28/18	09:15:00	W18-003-100	B3HKH6	N/A	629663	YES	Intact

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: S18-003 / SDG: See T.O.

Sample Receipt: 61434

Airbill: 7718 6743 4963

Custody Seal #(s): N/A

Date Received	Time Received	COC Record	SMO Sample #	Corresponding		Traffic Rpt, Tags, COC Agree	Sample Condition
				Sample Tag #	SwRI #		
03/30/18	08:45:00	S18-003-459	B3HFT4	N/A	629837	YES	Intact

SAMPLE LOG-IN SHEET

Lab Name Southwest Research Institute			Page 1 of 1		
Received By (Print Name) David Garcia			Log-in Date 03/20/2018		
Received By (Signature) <i>David Garcia</i>					
Case Number W18-003		Sample Delivery Group No. N/A		SAS Number N/A	
Remarks: 20859.01.00X					
		Corresponding		Remarks: Condition of Sample Shipment, etc	
	EPA Sample #	Sample Tag #	Assigned Lab #		
1. Custody Seal(s)	Present Absent* Intact Broken	B3HJN4	N/A	629427	Intact
2. Custody Seal Nos.	N/A	B3HJN9	N/A	629428	Intact
		B3HK67	N/A	629429	Intact
3. Chain-of Custody Records	Present Absent*	B3HK68	N/A	629430	Intact
4. Traffic Reports or Packing Lists	Present Absent*	B3HL16	N/A	629431	Intact
5. Airbill	Airbill/Sticker Present Absent*	B3HK61	N/A	629441	Intact
6. Airbill No.	771775273982, 77177527 4165				
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	03/20/2018				
12. Time Received	08:45:00				
Sample Transfer					
Fraction ORG, I10R9	Fraction				
Area # VARIOUS	Area #				
By David Garcia	By				
On 03/20/2018	On				

* Contact SMO and attach record of resolution

Reviewed By <i>David Garcia</i>	Logbook No. Sample Receipt (61374)
Date 3.20.18	Logbook Page No. 10130 Sec 1 of 3

SAMPLE LOG-IN SHEET

Lab Name Southwest Research Institute			Page 1 of 1		
Received By (Print Name) David Garcia			Log-in Date 03/21/2018		
Received By (Signature) <i>David Garcia</i>					
Case Number CHPRC	Sample Delivery Group No. N/A			SAS Number N/A	
Remarks: 20859.01.00X					
		Corresponding		Remarks: Condition of Sample Shipment, etc	
	EPA Sample #	Sample Tag #	Assigned Lab #		
1. Custody Seal(s)	<input checked="" type="radio"/> Present <input type="radio"/> Absent* <input checked="" type="radio"/> Intact <input type="radio"/> Broken	B3FW34	N/A	629453	Intact
2. Custody Seal Nos.	N/A	B3HL78	N/A	629454	Intact
		B3HL81	N/A	629455	Intact
		B3HL82	N/A	629456	Intact
3. Chain-of Custody Records	<input checked="" type="radio"/> Present <input type="radio"/> Absent*				
4. Traffic Reports or Packing Lists	<input checked="" type="radio"/> Present <input type="radio"/> Absent*				
5. Airbill	Airbill/Sticker <input checked="" type="radio"/> Present <input type="radio"/> Absent*				
6. Airbill No.	7717 9192 5585				
7. Sample Tags	Present <input checked="" type="radio"/> Absent <input type="radio"/> N/A				
Sample Tag Numbers	Listed <input checked="" type="radio"/> Not listed on Chain of Custody <input type="radio"/>				
8. Sample Condition	<input checked="" type="radio"/> Intact <input type="radio"/> Broken* / <input type="radio"/> Leaking				
9. Cooler Temperature	1.5C				
10. Does Information on custody records, traffic reports, and sample tags agree?	<input checked="" type="radio"/> Yes <input type="radio"/> No*				
11. Date Received at Lab	03/21/2018				
12. Time Received	10:20:00				
Sample Transfer					
Fraction	INORG	Fraction			
Area #	R.13	Area #			
By	David Garcia	By			
On	03/21/2018	On			

* Contact SMO and attach record of resolution

Reviewed By <i>David Garcia</i>	Logbook No.	Sample Receipt (61382)
Date 3.21.18	Logbook Page No.	10131 Sec 1 of 2

SAMPLE LOG-IN SHEET

Lab Name Southwest Research Institute			Page 1 of 1		
Received By (Print Name) David Garcia			Log-in Date 03/23/2018		
Received By (Signature) <i>David Garcia</i>					
Case Number S18-003		Sample Delivery Group No. N/A		SAS Number N/A	
Remarks: 20859.01.00X					
		EPA Sample #		Corresponding	
		Sample Tag #		Assigned Lab #	
1. Custody Seal(s)		<input checked="" type="radio"/> Present / <input type="radio"/> Absent* <input checked="" type="radio"/> Intact / <input type="radio"/> Broken		B3HFP8 R/A 629564 Intact	
2. Custody Seal Nos.		N/A		B3HL80 N/A 629565 Intact	
				B3HL89 R/A 629566 Intact	
3. Chain-of Custody Records		<input checked="" type="radio"/> Present / <input type="radio"/> Absent*			
4. Traffic Reports or Packing Lists		<input checked="" type="radio"/> Present / <input type="radio"/> Absent*			
5. Airbill		Airbill/Sticker <input checked="" type="radio"/> Present / <input type="radio"/> Absent*			
6. Airbill No.		7718 1461 5503			
7. Sample Tags		Present <input checked="" type="radio"/> Absent* N/A			
Sample Tag Numbers		Listed <input checked="" type="radio"/> Not listed on Chain of Custody			
8. Sample Condition		<input checked="" type="radio"/> Intact / <input type="radio"/> Broken* / <input type="radio"/> Leaking			
9. Cooler Temperature		1.9C			
10. Does Information on custody records, traffic reports, and sample tags agree?		<input checked="" type="radio"/> Yes / <input type="radio"/> No*			
11. Date Received at Lab		03/23/2018			
12. Time Received		08:50:00			
Sample Transfer					
Fraction Inorg		Fraction			
Area # R.13		Area #			
By David Garcia		By			
On 03/23/2018		On			

* Contact SMO and attach record of resolution

Reviewed By <i>David Garcia</i>	Logbook No.	Sample Receipt (61399)
Date 03.23.18	Logbook Page No.	10133 Sec 2 of 3

SAMPLE LOG-IN SHEET

Lab Name Southwest Research Institute			Page 1 of 1	
Received By (Print Name) David Garcia			Log-in Date 03/28/2018	
Received By (Signature) <i>David Garcia</i>				
Case Number CHPRC		Sample Delivery Group No. N/A		SAS Number N/A
Remarks: 20859.01.00X		Corresponding		
		EPA Sample #	Sample Tag #	Assigned Lab #
1. Custody Seal(s)	<input checked="" type="radio"/> Present / <input type="radio"/> Absent* <input checked="" type="radio"/> Intact / <input type="radio"/> Broken	B3F8F3	N/A	629661
2. Custody Seal Nos.	N/A	B3HKK5	N/A	629662
		B3HKK6	N/A	629663
3. Chain-of Custody Records	<input checked="" type="radio"/> Present / <input type="radio"/> Absent*			
4. Traffic Reports or Packing Lists	<input checked="" type="radio"/> Present / <input type="radio"/> Absent*			
5. Airbill	Airbill / <input checked="" type="radio"/> Sticker Present / <input type="radio"/> Absent*			
6. Airbill No.	7718 4803 8296			
7. Sample Tags	Present / <input checked="" type="radio"/> Absent* N/A			
Sample Tag Numbers	Listed / <input checked="" type="radio"/> Not listed on Chain of Custody			
8. Sample Condition	<input checked="" type="radio"/> Intact / <input type="radio"/> Broken* / <input type="radio"/> Leaking			
9. Cooler Temperature	1.8C			
10. Does information on custody records, traffic reports, and sample tags agree?	<input checked="" type="radio"/> Yes / <input type="radio"/> No*			
11. Date Received at Lab	03/28/2018			
12. Time Received	09:15:00			
Sample Transfer				
Fraction	<i>I1009</i>	Fraction		
Area #	<i>R.13</i>	Area #		
By	David Garcia	By		
On	03/28/2018	On		

* Contact SMO and attach record of resolution

Reviewed By <i>Art Agnelli</i>	Logbook No.	Sample Receipt (61420)
Date <i>3.28.18</i>	Logbook Page No. <i>✓</i>	10138 <i>sec 1025</i>

SAMPLE LOG-IN SHEET

Lab Name Southwest Research Institute			Page 1 of 1
Received By (Print Name) David Garcia			Log-in Date 03/30/2018
Received By (Signature) <i>David Garcia</i>			
Case Number S18-003	Sample Delivery Group No. N/A		SAS Number N/A
Remarks: 20859.01.00X			
		Corresponding	
	EPA Sample #	Sample Tag #	Assigned Lab #
1. Custody Seal(s)	<input checked="" type="checkbox"/> Present / <input checked="" type="checkbox"/> Intact	B3HFT4	629837
2. Custody Seal Nos.	N/A		
3. Chain-of Custody Records	<input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent*		
4. Traffic Reports or Packing Lists	<input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent*		
5. Airbill	<input checked="" type="checkbox"/> Present / <input type="checkbox"/> Absent*		
6. Airbill No.	7718 6743 4963		
7. Sample Tags	<input type="checkbox"/> Present / <input checked="" type="checkbox"/> Absent		
Sample Tag Numbers	Listed / <input checked="" type="checkbox"/> Not listed on Chain of Custody		
8. Sample Condition	<input checked="" type="checkbox"/> Intact / <input type="checkbox"/> Broken* / <input type="checkbox"/> Leaking		
9. Cooler Temperature	1.8C		
10. Does Information on custody records, traffic reports, and sample tags agree?	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No*		
11. Date Received at Lab	03/30/2018		
12. Time Received	08:45:00		
Sample Transfer			
Fraction <i>Inorg</i>	Fraction		
Area # <i>R.13</i>	Area #		
By David Garcia	By		
On 03/30/2018	On		

* Contact SMO and attach record of resolution

Reviewed By <i>Det Aguirre</i>	Logbook No.	Sample Receipt (61434)
Date <i>3.30.18</i>	Logbook Page No. <i>10140</i>	<i>Sec 1 of 4</i>

SOUTHWEST RESEARCH INSTITUTE**CLIENT: CH2M Hill Plateau Remediation Company****SwRI PROJECT#: 20859.01.00X****SwRI TASK ORDER: 180320-7, 180321-6, 180323-3,
180328-8, 180330-6****SwRI SRR: 61374, 61382, 61399, 61420, 61434****SDG: 629427****VTSR: 03.20.2018, 03.21.2018, 03.23.2018,
03.28.2018, 03.30.2018**

pH Report

SwRI

pH Preservation Report

Sample Receipt: 61374

Customer: CH2M Hill Plateau Remediation

Project: 20859.01.00X

Case: W18-003

Received: 03/20/2018

Samples Logged in by: DXGARCIA

SwRI #	Customer ID	Container ID	Initial pH	Login			Lab					
				Adjustment	Final pH	Paper Lot	Adjustment	Final pH	Paper lot	Adjusted	Lab Staff ID	
629427 1	B3HJN4											
629427 2	B3HJN4											
629427 3	B3HJN4											
629427 4	B3HJN4											
629428 1	B3HJN9	9012	>=12									
629428 2	B3HJN9	8290										
629428 3	B3HJN9	8290										
629428 4	B3HJN9	8290										
629428 5	B3HJN9	8290										
629429 1	B3HK67											
629429 2	B3HK67											
629429 3	B3HK67											
629429 4	B3HK67											
629430 1	B3HK68											
629430 2	B3HK68											
629430 3	B3HK68											
629430 4	B3HK68											
629431 1	B3HL16		>=12									
629441 1	B3HK61											
629441 2	B3HK61											
629441 3	B3HK61											
629441 4	B3HK61											

SwRI

pH Preservation Report

Sample Receipt: 61382

Customer: CH2M Hill Plateau Remediation

Project: 20859.01.00X

Case: CHPRC

Received: 03/21/2018

Samples Logged in by: DXGARCIA

SwRI #	Customer ID	Container ID	Initial pH	Login			Lab					
				Adjustment	Final pH	Paper Lot	Adjustment	Final pH	Paper lot	Adjusted	Lab Staff ID	
629453 1	B3FW34											
629454 1	B3HL78		>=12									
629455 1	B3HL81		>=12									
629456 1	B3HL82		>=12									

SwRI

pH Preservation Report

Sample Receipt: 61399

Customer: CH2M Hill Plateau Remediation

Project: 20859.01.00X

Case: S18-003

Received: 03/23/2018

Samples Logged in by: DXGARCIA

SwRI #	Customer ID	Container ID	Initial pH	Login			Lab					
				Adjustment	Final pH	Paper Lot	Adjustment	Final pH	Paper lot	Adjusted	Lab Staff ID	
629564 1	B3HFP8		>=12									
629565 1	B3HL80		>=12									
629566 1	B3HL89		>=12									

SwRI

pH Preservation Report

Sample Receipt: 61420

Customer: CH2M Hill Plateau Remediation

Project: 20859.01.00X

Case: CHPRC

Received: 03/28/2018

Samples Logged in by: DXGARCIA

SwRI #	Customer ID	Container ID	Initial pH	Login			Lab				
				Adjustment	Final pH	Paper Lot	Adjustment	Final pH	Paper lot	Adjusted	Lab Staff ID
629661 1	B3F8F3	SRISO	<2								
629661 2	B3F8F3	C14									
629662 1	B3HKH5		>=12								
629663 1	B3HKH6		>=12								

SwRI

pH Preservation Report

Sample Receipt: 61434

Customer: CH2M Hill Plateau Remediation

Project: 20859.01.00X

Case: S18-003

Received: 03/30/2018

Samples Logged in by: DXGARCIA

SwRI #	Customer ID	Container ID	Initial pH	Login			Lab				
				Adjustment	Final pH	Paper Lot	Adjustment	Final pH	Paper lot	Adjusted	Lab Staff ID
629837 1	B3HFT4		>=12								

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 180320-7
SwRI SRR: 61374
SDG: 629427
VTSR: 03.20.2018

Case Narrative

CLIENT: CH2M Hill Plateau Remediation Company

SDG: 629427

SwRI Project Number: 20859.01.00X

SwRI Sample Receipt Number: 61374, 61382, 61399, 61420, 61434

Page#: 1

SwRI CASE NARRATIVE

1. Fifteen (15) samples were received for Dioxins by SW846 Method 8290A, and Cyanide Analyses by SW846 Method 9012 and SW846 Method 9014:

SwRI ID	Customer ID	Matrix
629427	B3HJN4	Water
629428	B3HJN9	Water
629429	B3HK67	Water
629430	B3HK68	Water
629431	B3HL16	Water
629441	B3HK61	Water
629454	B3HL78	Water
629455	B3HL81	Water
629456	B3HL82	Water
629564	B3HFP8	Water
629565	B3HL80	Water
629566	B3HL89	Water
629662	B3HKH5	Water
629663	B3HKH6	Water
629837	B3HFT4	Water

Client: CH2M Hill Plateau Remediation Company

SDG: 629427

SwRI Project Number: 20859.01.00X

SwRI Task Order Number(s): 180320-7, 180321-6, 180323-3, 180328-8, 180330-6

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:

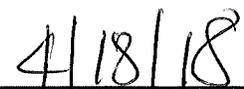
All holding times were met.

Cyanide:

All PBs, ICB's and CCB's were less than the reporting limit. All LCSWs were within 80-120% recovery and all ICV's and CCV's were within 90-110% recovery. The method states 90-110% recovery criteria for LSH and LSL; 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. Free cyanide for sample SwRI# 629662 was greater than the total cyanide, which was below the reporting limit. However, the samples free cyanide was only 4X the reporting limit.

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Principal Scientist

Date

Client: CH2M Hill Plateau Remediation Company

SDG: 629427

SwRI Project Number: 20859.01.00X

SwRI Task Order Number: 180320-7

DIOXIN ANALYSIS

Five water samples were analyzed for target and total chlorinated dibenzo-p-dioxins and dibenzofurans according to EPA Method 8290A – “Polychlorinated Dibenzop-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High Resolution Gas Chromatography / High Resolution Mass Spectrometry (HRGC/HRMS)” and SwRI TAP-01-0403-014. The instrument used was a Micromass Autospec M Series high-resolution gas chromatograph/high-resolution mass spectrometer (HRGC/HRMS), operated at 10,000 resolution power throughout the analysis. The analytical column used was a Phenomenex ZB-5 (60 m, 0.32 mm ID, 0.25 μ m film thickness).

The samples were extracted within 30 days of CED and analyzed within 45 days of extraction.

The samples were reported on an as-received basis in the method units of pg/L.

The initial calibration met the QC requirement of ≤ 20 % relative standard deviation (RSD) for unlabeled standards and ≤ 20 % RSD for labeled standards. The calibration verification standards met the Quality Control (QC) criteria of ≤ 20 % for native target compounds and ≤ 30 % for internal standards. Sample quantitations are based on the mean RRF from the corresponding ICAL. The CRQLs were based on concentrations of 0.500 pg/ μ L, 1.25 pg/ μ L, and 2.50 pg/ μ L for tetra-, penta-through hepta-, and octa-substituted compounds, respectively. Note that the ^{37}Cl -2,3,7,8-TCDD cleanup standard is not present in one or more of the calibration standards. This compound is used as a diagnostic tool by the laboratory and is not required by the method. The absence of the compound in the specified standards has no impact on the data.

The analytical sequences met the chromatographic resolution QC criteria of ≤ 25 % for 2,3,7,8-TCDD and its closest eluting isomer, as well as the beginning and ending mass resolution checks.

The samples, extraction blank, matrix spike (MS), matrix spike duplicate (MSD), and laboratory control sample (LCS) were spiked with 10 μ L of carbon-13 labeled internal standard mixture at the beginning of extraction. This internal standard mixture contained:

$^{13}\text{C}_{12}$ -2378-TCDD	50 pg/ μ L
$^{13}\text{C}_{12}$ -2378-TCDF	50 pg/ μ L
$^{13}\text{C}_{12}$ -12378-PeCDD	50 pg/ μ L
$^{13}\text{C}_{12}$ -12378-PeCDF	50 pg/ μ L
$^{13}\text{C}_{12}$ -123678-HxCDD	125 pg/ μ L
$^{13}\text{C}_{12}$ -123478-HxCDF	125 pg/ μ L
$^{13}\text{C}_{12}$ -1234678-HpCDD	125 pg/ μ L
$^{13}\text{C}_{12}$ -1234678-HpCDF	125 pg/ μ L
$^{13}\text{C}_{12}$ -OCDD	250 pg/ μ L

Client: CH2M Hill Plateau Remediation Company

SDG: 629427

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The MS, MSD, and LCS were spiked with 10 μL of the following matrix spiking solution:

2,3,7,8-TCDD	10 pg/ μL
1,2,3,7,8-PeCDD	25 pg/ μL
1,2,3,4,7,8-HxCDD	25 pg/ μL
1,2,3,6,7,8-HxCDD	25 pg/ μL
1,2,3,7,8,9-HxCDD	25 pg/ μL
1,2,3,4,6,7,8-HpCDD	25 pg/ μL
OCDD	50 pg/ μL
2,3,7,8-TCDF	10 pg/ μL
1,2,3,7,8-PeCDF	25 pg/ μL
2,3,4,7,8-PeCDF	25 pg/ μL
1,2,3,4,7,8-HxCDF	25 pg/ μL
1,2,3,6,7,8-HxCDF	25 pg/ μL
1,2,3,7,8,9-HxCDF	25 pg/ μL
2,3,4,6,7,8-HxCDF	25 pg/ μL
1,2,3,4,6,7,8-HpCDF	25 pg/ μL
1,2,3,4,7,8,9-HpCDF	25 pg/ μL
OCDF	50 pg/ μL

The sample extracts were spiked with 25 μL of cleanup standard containing ^{37}Cl -2,3,7,8-TCDD at 4.0 pg/ μL prior to putting them through a series of clean-up processes, which included H_2SO_4 wash, silica gel column chromatography, alumina column chromatography, and, if necessary, activated carbon on silica column chromatography. The final sample extract residues were reconstituted into 40 μL of solution by adding 10 μL of recovery standard mixture and 30 μL of nonane. The addition of nonane prior to injection does not constitute a physical dilution of the sample and only serves to help minimize potential matrix effects in the extract. The recovery standard mixture contains $^{13}\text{C}_{12}$ -1234-TCDD at 50 pg/ μL . One (1) μL of each well-mixed final sample extract was then injected into HRGC/HRMS.

The total pg concentration of a particular PCDD/PCDF in a sample can be obtained simply by multiplying the pg/ μL value in the "Amount" column of the quantitation summary by 10 (the final effective extract volume). The concentration values in pg/L can be obtained by dividing this total pg value with sample volume (L).

Three types of detection limits are reported.

- a. CRQL (derived from CLP's contract required quantitation limits). CRQL was calculated based on the concentration of the lowest point calibration standard, final

Client: CH2M Hill Plateau Remediation Company

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extract volume, sample size, and % dry weight (if applicable).

- b. EMPC (Estimated Maximum Possible Concentration). EMPC was reported when signals of both ions of a target PCDD/PCDF were detected with everything meeting identification criteria except the isotope ratio. The EMPC was calculated the same way a positive result was calculated.
- c. An EDL (Estimated Detection Limit) was calculated when no signals for the monitored ions were detected for a target PCDD/PCDF. EDL was calculated based on noise level at the retention time of the target PCDD/PCDF, peak height of the C-13 labeled internal standard, RRF of the target PCDD/PCDF, final extract volume, sample size, and % dry weight (if applicable). Note that the calculated detection limit on the data system has only two decimal places, and noise levels below 0.01 will register a zero EDL.

CRQL will be reported for every target PCDD/PCDF of every sample. EMPC or EDL will be reported only for target PCDD/PCDF not meeting isotope ratio (EMPC) or simply not found (EDL).

Possible qualifiers:

- U Target compound not detected.
- J Target compound found at the concentration below the calibration range.
- E Target compound found at the concentration above the calibration range.
- D Target compound concentration reported based on dilution analysis that brought the concentration within calibration range.
- B Target compound was detected in the associated blank.

The method blank contained no detected target analytes.

The internal standards were within the QC limits of 40-135% for all samples and QC.

Analysis Reports were modified to include CRQL values for Target and Total PCDD's and PCDF's that were not detected. These values are based on a single congener at the same level of chlorination. These values have also been included in the electronic deliverable. This modification was made at the request of the client.

Spike recoveries for the MS and MSD were within the DOE QSM 8290 water QC limits for all

Client: CH2M Hill Plateau Remediation Company

SDG: 629427

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analytes. The relative percent difference (RPD) between the MS and MSD was within the QC limit of 20% for all analytes.

Spike recoveries for the LCS were within the DOE QSM 8290 water QC limits for all analytes.

Sample Calculations:

Positive result (or EMPC) calculation

(minor differences to the Form I are due to rounding)

Sample: LCS_05APR18

Lab ID: 630223

Analyte: 2,3,7,8-TCDD

Response_(NAT): 6.239e4

Response_(IS): 2.228e5

Native RRF: 1.251

IS Conc.: 50.0 pg/μL

Sample Weight/Vol: 1.00 L

Extract Vol: 10 μL

Percent Dry: N/A

$$\text{Conc}(pg / \mu L) = \frac{(\text{Area}_{\text{Nat}})(\text{Conc}_{\text{IS}})}{(\text{Area}_{\text{IS}})(\text{RRF}_{\text{Nat}})} = \frac{(6.239e4)(50.0)}{(2.228e5)(1.251)} = 11.2 pg / \mu L$$

$$\text{Conc}(pg / L) = \frac{(\text{Conc}_{pg / \mu L})(\text{Vol}_{\text{Ext}})}{(\text{SampleVol})} = \frac{(11.2 pg / \mu L)(10 \mu L)}{(1.00L)} = 112 pg / L$$

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 Manager

4/13/18

 Date

SOUTHWEST RESEARCH INSTITUTE**CLIENT: CH2M Hill Plateau Remediation Company****SwRI PROJECT#: 20859.01.00X****SwRI TASK ORDER: 180320-7, 180321-6, 180323-3,
180328-8, 180330-6****SwRI SRR: 61374, 61382, 61399, 61420, 61434****SDG: 629427****VTSR: 03.20.2018, 03.21.2018, 03.23.2018,
03.28.2018, 03.30.2018**

Cyanide Results

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WetChem Report
Cover Page

Client: CH2M Hill Plateau Remediation Company
Task Order: 180323-3, 180330-6, 180320-7,
180328-8, 180321-6

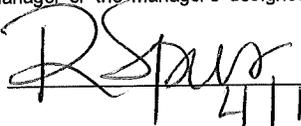
SDG: 629427
SRR: 61399, 61434, 61374, 61420, 61382

Case: S18-003, W18-003
Project: 20859.01.00X

Client Sample ID	Lab Sample ID
B3HFP8	629564
B3HFT4	629837
B3HJN9	629428
B3HJN9D	629428D
B3HKH5	629662
B3HKH5D	629662D
B3HKH6	629663
B3HL16	629431
B3HL78	629454
B3HL80	629565
B3HL81	629455
B3HL82	629456
B3HL89	629566

Comments:

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Signature: 
Date: 4/19/18

Name: Radonna Spies
Title: Principal Scientist

Cover Page

4/20/2018
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 Certificate of Analysis

010059 Client Sample ID
REV 0
B3HFP8
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3
 Lab ID: 629564
 Result Units: mg/L

SDG: 629427
 SRR: 61399
 Matrix: Water
 % Solids: NA

Case: S18-003
 Project: 20859.01.00X
 Receipt Date: 03/23/2018
 Collection Date: 03/22/2018

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	20180413-P004	04/05/2018 12:53

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010060 Client Sample ID
B3HFT4
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180330-6
 Lab ID: 629837
 Result Units: mg/L

SDG: 629427
 SRR: 61434
 Matrix: Water
 % Solids: NA

Case: S18-003
 Project: 20859.01.00X
 Receipt Date: 03/30/2018
 Collection Date: 03/28/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.111		KNO	0.00500	1	20180413-P004	04/05/2018 15:14

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010061 Client Sample ID
REV 0
B3HJN9
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7
 Lab ID: 629428
 Result Units: mg/L

SDG: 629427
 SRR: 61374
 Matrix: Water
 % Solids: NA

Case: W18-003
 Project: 20859.01.00X
 Receipt Date: 03/20/2018
 Collection Date: 03/16/2018

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	20180326-P001	03/22/2018 15:08

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010062 Client Sample ID
REV 0
B3HKH5
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180328-8
 Lab ID: 629662
 Result Units: mg/L

SDG: 629427
 SRR: 61420
 Matrix: Water
 % Solids: NA

Case: W18-003
 Project: 20859.01.00X
 Receipt Date: 03/28/2018
 Collection Date: 03/27/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	04/05/2018 10:57
57-12-5	Free Cyanide	0.0190		EVO	0.00500	1	NA	04/10/2018 12:07
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180413-P004	04/05/2018 12:53

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010063 Client Sample ID
REV 0
B3HKH6
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180328-8
 Lab ID: 629663
 Result Units: mg/L

SDG: 629427
 SRR: 61420
 Matrix: Water
 % Solids: NA

Case: W18-003
 Project: 20859.01.00X
 Receipt Date: 03/28/2018
 Collection Date: 03/27/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
	Amenable Cyanide	0.00500	U	NA	0.00500	1	NA	04/05/2018 10:57
57-12-5	Free Cyanide	0.00500	U	EVO	0.00500	1	NA	04/10/2018 12:07
57-12-5	Total Cyanide	0.00500	U	KNO	0.00500	1	20180413-P004	04/05/2018 13:24

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010064 Client Sample ID
B3HL16
REV 0
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7
 Lab ID: 629431
 Result Units: mg/L

SDG: 629427
 SRR: 61374
 Matrix: Water
 % Solids: NA

Case: W18-003
 Project: 20859.01.00X
 Receipt Date: 03/20/2018
 Collection Date: 03/16/2018

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	20180326-P001	03/22/2018 15:08

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010065 Client Sample ID
B3HL78
REV 0
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180321-6
 Lab ID: 629454
 Result Units: mg/L

SDG: 629427
 SRR: 61382
 Matrix: Water
 % Solids: NA

Case: S18-003
 Project: 20859.01.00X
 Receipt Date: 03/21/2018
 Collection Date: 03/20/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.00619		KNO	0.00500	1	20180326-P001	03/22/2018 15:08

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010066 Client Sample ID
B3HL80
REV 0
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3
 Lab ID: 629565
 Result Units: mg/L

SDG: 629427
 SRR: 61399
 Matrix: Water
 % Solids: NA

Case: S18-003
 Project: 20859.01.00X
 Receipt Date: 03/23/2018
 Collection Date: 03/22/2018

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	20180413-P004	04/05/2018 12:53

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

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010067 Client Sample ID
REV 0
B3HL81
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180321-6
 Lab ID: 629455
 Result Units: mg/L

SDG: 629427
 SRR: 61382
 Matrix: Water
 % Solids: NA

Case: S18-003
 Project: 20859.01.00X
 Receipt Date: 03/21/2018
 Collection Date: 03/20/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.153		KNO	0.00500	1	20180326-P001	03/22/2018 15:08

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

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 Certificate of Analysis

010068 Client Sample ID **REV 0**

B3HL82

Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180321-6
 Lab ID: 629456
 Result Units: mg/L

SDG: 629427
 SRR: 61382
 Matrix: Water
 % Solids: NA

Case: S18-003
 Project: 20859.01.00X
 Receipt Date: 03/21/2018
 Collection Date: 03/20/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.153		KNO	0.00500	1	20180326-P001	03/22/2018 15:08

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

4/20/2018
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 WetChem Report - Form I
 Certificate of Analysis

010069 Client Sample ID
B3HL89
Type: Unknown

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3
 Lab ID: 629566
 Result Units: mg/L

SDG: 629427
 SRR: 61399
 Matrix: Water
 % Solids: NA

Case: S18-003
 Project: 20859.01.00X
 Receipt Date: 03/23/2018
 Collection Date: 03/22/2018

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Total Cyanide	0.363		KNO	0.00500	1	20180413-P004	04/05/2018 12:53

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form I
 Certificate of Analysis

010070

REV 0
 SwRI ID

PB18C22JH1

Type: Blank

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3 + 4 others
 Lab ID: PB18C22JH1
 Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382
 Matrix: Water
 % Solids: NA

Case: W18-003, S18-003
 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	20180326-P001	03/22/2018 13:05

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form I
 Certificate of Analysis

010071

REV 0
 SwRI ID

PB18C22JH2

Type: Blank

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3 + 4 others
 Lab ID: PB18C22JH2
 Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382
 Matrix: Water
 % Solids: NA

Case: W18-003, S18-003
 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	20180326-P001	03/22/2018 14:11

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form I
 Certificate of Analysis

010072

REV 0
 SwRI ID

PB18D04JH2

Type: Blank

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3 + 4 others
 Lab ID: PB18D04JH2
 Result Units: mg/L

SDG: 629427
 SRR: 61399, 61420, 61434
 Matrix: Water
 % Solids: NA

Case: S18-003
 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	20180413-P004	04/05/2018 12:53

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form I
 Certificate of Analysis

010073

REV 0
 SwRI ID

ICB

Type: ICB/Blank

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3 + 4 others
 Lab ID: ICB
 Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Matrix: Water
 % Solids: NA

Case: W18-003, S18-003
 Project: 20859.01.00X
 Receipt Date: NA
 Collection Date: NA

CAS No.	Analyte	Result	Qual	M	RL	DF	Prep Batch	Analysis Date/Time
57-12-5	Free Cyanide	0.00500	U	EVO	0.00500	1	NA	04/10/2018 12:07

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form I
 Certificate of Analysis

010074

REV 0
 SwRI ID

PB18D17JH1

Type: Blank

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180323-3 + 4 others
 Lab ID: PB18D17JH1
 Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Matrix: Water
 % Solids: NA

Case: W18-003, S18-003
 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	04/05/2018 10:57

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	RL - SwRI Reporting Limit DF - Dilution Factor M - Instrument	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form I-IN

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batches: 20180326-A001

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: W18-003, S18-003
 Project: 20859.01.00X

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Total Cyanide	0.581	0.571	98.3%	90%-110%	0.581	0.571	98.3%	0.574	98.8%	90%-110%	KNO

<i>Instruments/Methods (M)</i>
KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form IIA-IN

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batches: 20180326-A001

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: W18-003, S18-003
 Project: 20859.01.00X

Continuing Calibration Verification											
Analyte	True	Found3	%Rec	Found4	%Rec	Found5	%Rec	Found6	%Rec	Limit	M
Total Cyanide	0.581	0.577	99.3%	0.568	97.8%	0.592	101.9%	0.572	98.5%	90%-110%	KNO

<i>Instruments/Methods (M)</i>
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form IIA-IN

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batches: 20180326-A001

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: W18-003, S18-003
 Project: 20859.01.00X

Continuing Calibration Verification					
Analyte	True	Found7	%Rec	Limit	M
Total Cyanide	0.581	0.581	100.0%	90%-110%	KNO

<i>Instruments/Methods (M)</i>
KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form IIA-IN

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batches: 20180417-A001

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: W18-003, S18-003
 Project: 20859.01.00X

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Total Cyanide	0.581	0.600	103.3%	90%-110%	0.581	0.586	100.9%	0.616	106.0%	90%-110%	KNO

<i>Instruments/Methods (M)</i>
KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form IIA-IN

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batches: 20180417-A001

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Initial Calibration Source: See Raw Data
 Continuing Calibration Source: See Raw Data

Case: W18-003, S18-003
 Project: 20859.01.00X

Continuing Calibration Verification									
Analyte	True	Found3	%Rec	Found4	%Rec	Found5	%Rec	Limit	M
Total Cyanide	0.581	0.610	105.0%	0.600	103.3%	0.617	106.2%	90%-110%	KNO

<i>Instruments/Methods (M)</i>
KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form IIA-IN

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batches: 20180417-A003

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Initial Calibration Source: Alfa-Aesar
 Continuing Calibration Source: Alfa-Aesar

Case: W18-003, S18-003
 Project: 20859.01.00X

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	True	Found	%Rec	Limit	True	Found1	%Rec	Found2	%Rec	Limit	M
Free Cyanide	0.250	0.261	104.4%	90%-110%	0.250	0.261	104.4%	0.275	110.0%	90%-110%	EVO

<i>Instruments/Methods (M)</i>
KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form IIA-IN

Initial and Continuing Calibration Verification

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batches: 20180417-A003

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Initial Calibration Source: Alfa-Aesar
 Continuing Calibration Source: Alfa-Aesar

Case: W18-003, S18-003
 Project: 20859.01.00X

Continuing Calibration Verification							
Analyte	True	Found3	%Rec	Found4	%Rec	Limit	M
Free Cyanide	0.250	0.263	105.2%	0.261	104.4%	90%-110%	EVO

<i>Instruments/Methods (M)</i>
KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form IIA-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form IIB
Low Level Check Standard

010082

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batch: 20180326-A001

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434

Case: W18-003, S18-003
 Project: 20859.01.00X

LLC Standards					
Analyte	True	Found1	%Rec	Limit	M
Total Cyanide	0.00500	0.00257	51.4%	50%-150%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form IIB-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form IIB
Low Level Check Standard

010083

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batch: 20180417-A001

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434

Case: W18-003, S18-003
 Project: 20859.01.00X

LLC Standards					
Analyte	True	Found1	%Rec	Limit	M
Total Cyanide	0.00500	0.00368	73.6%	50%-150%	KNO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form IIB-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form IIB
Low Level Check Standard

010084

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Result Units: mg/L
 Associated Analytical Batch: 20180417-A003

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434

Case: W18-003, S18-003
 Project: 20859.01.00X

LLC Standards					
Analyte	True	Found1	%Rec	Limit	M
Free Cyanide	0.00500	0.00400	80.0%	50%-150%	EVO

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form IIB-IN

Blanks

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Preparation Blank Result Units: mg/L
 Initial/Continuing Blank Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Preparation Blank Matrix: Water
 Associated Prep Batches: 20180326-P001

Case: W18-003, S18-003
 Project: 20859.01.00X
 Associated Analytical Batches: 20180326-A001

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

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Blanks

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Preparation Blank Result Units: mg/L
 Initial/Continuing Blank Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Preparation Blank Matrix: Water
 Associated Prep Batches: 20180326-P001

Case: W18-003, S18-003
 Project: 20859.01.00X
 Associated Analytical Batches: 20180326-A001

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

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Blanks

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Preparation Blank Result Units: mg/L
 Initial/Continuing Blank Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Preparation Blank Matrix: Water
 Associated Prep Batches: 20180413-P004

Case: W18-003, S18-003
 Project: 20859.01.00X
 Associated Analytical Batches: 20180417-A001

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

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Blanks

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Preparation Blank Result Units: mg/L
 Initial/Continuing Blank Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Preparation Blank Matrix: Water
 Associated Prep Batches: NA

Case: W18-003, S18-003
 Project: 20859.01.00X
 Associated Analytical Batches: 20180417-A002

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

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Blanks

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Preparation Blank Result Units: mg/L
 Initial/Continuing Blank Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Preparation Blank Matrix: Water
 Associated Prep Batches: NA

Case: W18-003, S18-003
 Project: 20859.01.00X
 Associated Analytical Batches: 20180417-A003

Analyte	Preparation Blank		Initial Calibration Blank		Continuing Calibration Blank								M
	Result	Qual	Found	Qual	Found1	Qual	Found2	Qual	Found3	Qual	Found4	Qual	
Free Cyanide	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	0.00500	U	EVO

Data Reporting Qualifiers (Qual)	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Matrix Spike/Matrix Spike Duplicate Sample Recovery

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7
 Lab ID: 629428S
 Result Units: mg/L

SDG: 629427
 SRR: 61374
 Matrix: Water
 % Solids: NA

Case: W18-003, S18-003
 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	0.0378	0.0400	94.5%	-	-	-	-	75%-125%	-	KNO	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	M - Instrument MS - Matrix Spike MSD - Matrix Spike Duplicate Q - Qualifier RPD - Relative Percent Difference	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Matrix Spike/Matrix Spike Duplicate Sample Recovery

Client: CH2M Hill Plateau Remediation Company SGD: 629427
 Task Order: 180328-8 SRR: 61420
 Lab ID: 629662S-F Matrix: Water
 Result Units: mg/L % Solids: NA

Case: W18-003, S18-003
 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
Free Cyanide	0.0190		0.0390	0.0250	80.0%	-	-	-	-	75%-125%	-	EVO	
Total Cyanide	0.00500	U	0.0348	0.0400	87.0%	-	-	-	-	75%-125%	-	KNO	

Data Reporting Qualifiers (Qual)	Columns	Instruments/Methods (M)
U - Result is less than the SwRI Reporting Limit (RL) N - Matrix spike and/or matrix spike duplicate criteria was not met X - Analytical spike criteria was not met E - Result is estimated due to interferences D - Result is reported from a dilution * - Duplicate criteria was not met	M - Instrument MS - Matrix Spike MSD - Matrix Spike Duplicate Q - Qualifier RPD - Relative Percent Difference	KNO - Konelab/Cyanide 9012 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Duplicates

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7
 Lab ID: 629428D
 Result Units: mg/L

SDG: 629427
 SRR: 61374
 Matrix: Water
 % Solids: NA

Case: W18-003, S18-003
 Project: 20859.01.00X

Analyte	Parent Sample Result	Qual	Duplicate Result	Qual	RPD	RPD Limit	Control Limit	M	Note
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 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Duplicates

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180328-8
 Lab ID: 629662D
 Result Units:

SDG: 629427
 SRR: 61420
 Matrix: Water
 % Solids: NA

Case: W18-003, S18-003
 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	0.0190		0.0200		5.13%	20%	0.00500	EVO	
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 NA - Not Applicable/Amenable Cyanide 9012 EVO - Evolution 220/Cyanide 9014

Form VI-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form VII
Laboratory Control Sample

010094

REV 0
 SWRI ID

ICV

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Lab ID: ICV
 Result Units: mg/L

SDG: 629427
 SRR: 61420, 61374, 61382, 61399, 61434
 Matrix: Water
 Associated Prep Batches: NA

Case: W18-003, S18-003
 Project: 20859.01.00X
 LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Free Cyanide	0.250	0.261		104.4%	85%-115%	EVO	04/10/2018 12:07

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form VII-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form VII
Laboratory Control Sample

010095

REV 0
 SWRI ID

LCS18C22JH1

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Lab ID: LCS18C22JH1
 Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Matrix: Water
 Associated Prep Batches: 20180326-P001

Case: W18-003, S18-003
 Project: 20859.01.00X
 LCS Source: ERA

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.581	0.552	D	95.0%	85%-115%	KNO	03/22/2018 13:05

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form VII-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form VII
Laboratory Control Sample

010096

REV 0
 SWRI ID

LCS18C26JH2

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Lab ID: LCS18C26JH2
 Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Matrix: Water
 Associated Prep Batches: 20180326-P001

Case: W18-003, S18-003
 Project: 20859.01.00X
 LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.500	0.450		90.0%	90%-110%	KNO	03/22/2018 14:39

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form VII-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form VII
Laboratory Control Sample

010097

REV 0
 SWRI ID

LCS18C26JH3

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Lab ID: LCS18C26JH3
 Result Units: mg/L

SDG: 629427
 SRR: 61374, 61382, 61399, 61420, 61434
 Matrix: Water
 Associated Prep Batches: 20180326-P001

Case: W18-003, S18-003
 Project: 20859.01.00X
 LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.0500	0.0471		94.2%	90%-110%	KNO	03/22/2018 13:05

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form VII-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form VII
Laboratory Control Sample

010098

REV 0
 SWRI ID

LCS18D04CS1

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Lab ID: LCS18D04CS1
 Result Units: mg/L

SDG: 629427
 SRR: 61399, 61420, 61434, 61374, 61382
 Matrix: Water
 Associated Prep Batches: 20180413-P004

Case: W18-003, S18-003
 Project: 20859.01.00X
 LCS Source:

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.500	0.469		93.8%	90%-110%	KNO	04/05/2018 12:53

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form VII-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form VII
Laboratory Control Sample

010099

REV 0
 SWRI ID

LCS18D04CS2

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Lab ID: LCS18D04CS2
 Result Units: mg/L

SDG: 629427
 SRR: 61399, 61420, 61434, 61374, 61382
 Matrix: Water
 Associated Prep Batches: 20180413-P004

Case: W18-003, S18-003
 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	04/05/2018 12:53

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form VII-IN

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form VII
Laboratory Control Sample

010100

REV 0
 SWRI ID

LCS18D04JH1

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Lab ID: LCS18D04JH1
 Result Units: mg/L

SDG: 629427
 SRR: 61399, 61420, 61434, 61374, 61382
 Matrix: Water
 Associated Prep Batches: 20180413-P004

Case: W18-003, S18-003
 Project: 20859.01.00X
 LCS Source: ERA

Analyte	True	Found	Qual	%Rec.	Limit	M	Analysis Date/Time
Total Cyanide	0.581	0.589	D	101.4%	85%-115%	KNO	04/05/2018 12:53

Instruments/Methods (M)
KNO - Konelab/Cyanide 9012
NA - Not Applicable/Amenable Cyanide 9012
EVO - Evolution 220/Cyanide 9014

Form VII-IN

Detection Limits

Client: CH2M Hill Plateau Remediation Company
Task Order: 180320-7 + 4 others
Result Units: mg/L

SDG: 629427
SRR: 61420, 61374, 61382, 61399, 61434
Instrument: Evolution 220

Case: W18-003, S18-003
Project: 20859.01.00X

Analyte	Wavelength	RL
Free Cyanide	578 nm	0.00500

Columns	
RL	- SwRI Reporting Limit

Detection Limits

Client: CH2M Hill Plateau Remediation Company
Task Order: 180320-7 + 4 others
Result Units: mg/L

SDG: 629427
SRR: 61374, 61382, 61399, 61420, 61434
Instrument: Konelab

Case: W18-003, S18-003
Project: 20859.01.00X
Date: 01/09/2014

Analyte	Wavelength	RL
Total Cyanide	575 nm	0.00500

Columns	
RL	- SwRI Reporting Limit

Detection Limits

Client: CH2M Hill Plateau Remediation Company
Task Order: 180320-7 + 4 others
Result Units: mg/L

SDG: 629427
SRR: 61420, 61374, 61382, 61399, 61434
Instrument:

Case: W18-003, S18-003
Project: 20859.01.00X

Analyte	RL
Amenable Cyanide	0.00500

Columns	
RL	- SwRI Reporting Limit

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form XII
 Analysis Run Log

010104

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Analytical Batch: 20180326-A001
 Analysis Method: Cyanide 9012

SDG: 629427
 SRR: 61331 + 6 others
 Instrument: Konelab

Case: W18-003, S18-003
 Project: 20859.01.00X
 Start Date: 03/22/2018
 End Date: 03/22/2018

Lab Sample ID	Client Sample ID	Time	DF	ATT	CC	NN
CN-0	CN-0	12:35	1			X
CN-0.005	CN-0.005	12:35	1			X
CN-0.01	CN-0.01	12:35	1			X
CN-0.05	CN-0.05	12:35	1			X
CN-0.1	CN-0.1	12:35	1			X
CN-0.25	CN-0.25	12:35	1			X
CN-0.5	CN-0.5	12:35	1			X
CN-ICV	CN-ICV	13:05	2			X
CN-ICB	CN-ICB	13:05	1			X
CN-LLC	NA	13:05	1			X
PB18C22JH1	NA	13:05	1			X
LCS18C22JH1	NA	13:05	2			X
LCS18C26JH2	NA	13:05	1			
LCS18C26JH3	NA	13:05	1			X
Z	Z	13:05	1			
Z	Z	13:05	1			
Z	Z	13:05	1			
Z	Z	13:05	1			
Z	Z	13:05	1			
CN-CCV	CN-CCV	13:37	2			X
CN-CCB	CN-CCB	13:37	1			X
Z	Z	13:37	1			
Z	Z	13:37	1			
Z	Z	13:37	1			
Z	Z	13:37	1			
Z	Z	13:37	1			
Z	Z	13:37	1			
Z	Z	13:37	1			
Z	Z	13:37	1			
Z	Z	13:37	1			
CN-CCV2	CN-CCV2	14:11	2			X
CN-CCB2	CN-CCB2	14:11	1			X
Z	Z	14:11	1			
PB18C22JH2	NA	14:11	1			X
PB-CL	NA	14:11	1			
Z	Z	14:11	1			
Z	Z	14:11	1			
Z	Z	14:11	1			
Z	Z	14:11	1			
Z	Z	14:11	1			
Z	Z	14:11	1			
Z	Z	14:11	1			
Z	Z	14:11	1			
CN-CCV3	CN-CCV3	14:39	2			X
CN-CCB3	CN-CCB3	14:39	1			X
Z	Z	14:39	1			
Z	Z	14:39	1			
Z	Z	14:39	1			
Z	Z	14:39	1			
Z	Z	14:39	1			
Z	Z	14:39	1			
Z	Z	14:39	1			
Z	Z	14:39	1			
Z	Z	14:39	1			
LCS18C26JH2	NA	14:39	1			X
CN-CCV4	CN-CCV4	15:08	2			X

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form XII
 Analysis Run Log

010105

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Analytical Batch: 20180326-A001
 Analysis Method: Cyanide 9012

SDG: 629427
 SRR: 61331 + 6 others
 Instrument: Konelab

Case: W18-003, S18-003
 Project: 20859.01.00X
 Start Date: 03/22/2018
 End Date: 03/22/2018

Lab Sample ID	Client Sample ID	Time	DF	A	T	T
				C	C	C
				N	N	N
CN-CCB4	CN-CCB4	15:08	1			X
Z	Z	15:08	1			
Z	Z	15:08	1			
Z	Z	15:08	1			
629428	B3HJN9	15:08	1			X
629428D	B3HJN9D	15:08	1			X
629428S	B3HJN9MS	15:08	1			X
629431	B3HL16	15:08	1			X
629454	B3HL78	15:08	1			X
629455	B3HL81	15:08	1			X
629456	B3HL82	15:08	1			X
CN-CCV5	CN-CCV5	15:36	2			X
CN-CCB5	CN-CCB5	15:36	1			X
Z	Z	15:36	1			
Z	Z	15:36	1			
CN-CCV6	CN-CCV6	15:36	2			X
CN-CCB6	CN-CCB6	15:36	1			X
Z	Z	16:12	1			
Z	Z	16:12	1			
Z	Z	16:12	1			
Z	Z	16:12	1			
CN-CCV7	CN-CCV7	16:12	2			X
CN-CCB7	CN-CCB7	16:12	1			X

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form XII
Analysis Run Log

010106

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Analytical Batch: 20180417-A002
 Analysis Method: Amenable Cyanide 9012

SDG: 629427
 SRR: 61420, 61448, 61374, 61382, 61399, 61434
 Instrument:

Case: W18-003, S18-003
 Project: 20859.01.00X
 Start Date: 04/05/2018
 End Date: 04/05/2018

Lab Sample ID	Client Sample ID	Time	DF	A	T	T
				C	C	C
				N	N	N
PB18D17JH1	NA	10:57	1	X		
629662	B3HKH5	10:57	1	X		
629662D	B3HKH5D	10:57	1	X		
629663	B3HKH6	10:57	1	X		
Z	Z	10:57	1			
Z	Z	10:57	1			

4/20/2018
SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form XII
 Analysis Run Log

010107

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Analytical Batch: 20180417-A001
 Analysis Method: Cyanide 9012

SDG: 629427
 SRR: 61399, 61420, 61434, 61448, 61374, 61382
 Instrument: Konelab

Case: W18-003, S18-003
 Project: 20859.01.00X
 Start Date: 04/05/2018
 End Date: 04/05/2018

Lab Sample ID	Client Sample ID	Time	DF	ATT	CC	NN
CN-0	CN-0	12:26	1			X
CN-0.005	CN-0.005	12:26	1			X
CN-0.01	CN-0.01	12:26	1			X
CN-0.05	CN-0.05	12:26	1			X
CN-0.1	CN-0.1	12:26	1			X
CN-0.25	CN-0.25	12:26	1			X
CN-0.5	CN-0.5	12:26	1			X
CN-ICV	CN-ICV	12:53	2			X
CN-ICB	CN-ICB	12:53	1			X
CN-LLC	NA	12:53	1			X
PB18D04JH2	NA	12:53	1			X
LCS18D04JH1	NA	12:53	2			X
LCS18D04CS1	NA	12:53	1			X
LCS18D04CS2	NA	12:53	1			X
629564	B3HFP8	12:53	1			X
629565	B3HL80	12:53	1			X
629566	B3HL89	12:53	1			X
629662	B3HKKH5	12:53	1			X
629662D	B3HKKH5D	12:53	1			X
CN-CCV	CN-CCV	13:24	2			X
CN-CCB	CN-CCB	13:24	1			X
629662S	B3HKKH5MS	13:24	1			X
629663	B3HKKH6	13:24	1			X
PB18D04JH3	NA	13:24	1			
Z	Z	13:24	1			
Z	Z	13:24	1			
Z	Z	13:24	1			
Z	Z	13:24	1			
CN-CCV2	CN-CCV2	14:19	2			X
CN-CCB2	CN-CCB2	14:46	1			X
629837	B3HFT4	15:14	1			X
Z	Z	15:14	1			
Z	Z	15:14	1			
Z	Z	15:14	1			
Z	Z	15:14	1			
Z	Z	15:14	1			
Z	Z	15:15	1			
Z	Z	15:15	1			
Z	Z	15:15	1			
Z	Z	15:15	1			
CN-CCV3	CN-CCV3	15:45	2			X
CN-CCB3	CN-CCB3	15:45	1			X
Z	Z	15:45	1			
Z	Z	15:45	1			
Z	Z	15:45	1			
Z	Z	15:45	1			
Z	Z	15:45	1			
Z	Z	15:45	1			
Z	Z	15:45	1			
Z	Z	15:45	1			
Z	Z	15:45	1			
CN-CCV4	CN-CCV4	16:16	2			X
CN-CCB4	CN-CCB4	16:16	1			X
Z	Z	16:16	1			
Z	Z	16:16	1			
Z	Z	16:16	1			

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SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form XII
Analysis Run Log

010108

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Analytical Batch: 20180417-A001
 Analysis Method: Cyanide 9012

SDG: 629427
 SRR: 61399, 61420, 61434, 61448, 61374, 61382
 Instrument: Konelab

Case: W18-003, S18-003
 Project: 20859.01.00X
 Start Date: 04/05/2018
 End Date: 04/05/2018

Lab Sample ID	Client Sample ID	Time	DF	A	T	T
				C	C	C
				N	N	N
Z	Z	16:16	1			
Z	Z	16:16	1			
Z	Z	16:16	1			
Z	Z	16:16	1			
Z	Z	16:16	1			
Z	Z	16:16	1			
Z	Z	16:16	1			
CN-CCV5	CN-CCV5	16:48	2			X
CN-CCB5	CN-CCB5	16:48	1			X

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SOUTHWEST RESEARCH INSTITUTE
 WetChem Report - Form XII
 Analysis Run Log

010109

REV.0

Client: CH2M Hill Plateau Remediation Company
 Task Order: 180320-7 + 4 others
 Analytical Batch: 20180417-A003
 Analysis Method: Cyanide 9014

SDG: 629427
 SRR: 61420, 61448, 61374, 61382, 61399, 61434
 Instrument: Evolution 220

Case: W18-003, S18-003
 Project: 20859.01.00X
 Start Date: 04/10/2018
 End Date: 04/10/2018

Lab Sample ID	Client Sample ID	Time	DF	ATT CC NN	TT CC NN
ICV	NA	12:07	1	X	
ICB	NA	12:07	1	X	
LLC	NA	12:07	1	X	
629662-F	B3HKH5	12:07	1	X	
629662D-F	B3HKH5D	12:07	1	X	
629662S-F	B3HKH5MS	12:07	1	X	
629663-F	B3HKH6	12:07	1	X	
CCV	CCV	12:07	1	X	
CCB	CCB	12:07	1	X	
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
CCV2	CCV2	12:07	1	X	
CCB2	CCB2	12:07	1	X	
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
PB18D04JH2	NA	12:07	1		
PB18D04JH4	NA	12:07	1		
PB18D04JH5	NA	12:07	1		
LOQ1	NA	12:07	1		
LOQ2	NA	12:07	1		
LOQ3	NA	12:07	1		
CCV3	CCV3	12:07	1	X	
CCB3	CCB3	12:07	1	X	
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
CCV4	CCV4	12:07	1	X	
CCB4	CCB4	12:07	1	X	
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
Z	Z	12:07	1		
LOQ1-R	NA	12:07	1		
CCV5	CCV5	12:07	1		
CCB5	CCB5	12:07	1		

~~4/20/2018~~
SOUTHWEST RESEARCH INSTITUTE
WetChem Report - Form XVIII
Preparation/Digestion Summary

010110

REV.0

Client: CH2M Hill Plateau Remediation Company
Task Order: 180320-7 + 4 others

SDG: 629427
SRR: 61374, 61382, 61399, 61420, 61434

Case: W18-003, S18-003
Project: 20859.01.00X

Prep Batch	Method	Preparation Date
20180326-P001	CN prep	03/22/2018
20180413-P004	CN prep	04/04/2018

4/20/2018
Digestion Log

010111

REV.0

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180326-P001 (Ver. 3)
Status: DISPOSED

Client(s): CH2M Hill Plateau Remediation Company
 Task Order(s): 180313-4, 180316-10, 180320-7, 180321-6
 SDG(s): 628879, 629427
 Project(s): 20859.01.00X
 Method(s): CN prep (TAP: 01-0406-134)
 Matrix(s): Water
 Reagent(s): (CN) Releasing Reagent #150-01-WCS14, (CN) 1N NaOH #150-01-WCS14, (CN) 0.25N NaOH#149-01-WCS14
 Pipette(s): 5000-12, 1000-1, 200-H
 Heating Device: MIDI-STIL Temperature (C): 125C
 Time In: 03/22/2018 10:52:51 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)
PB18C22JH1	NA	6	6
LCS18C22JH1 ①	NA	6	6
LCS18C26JH2 ②	NA	6	6
LCS18C26JH3 ③	NA	6	6
628879	B3HJK6	6	6
628879D	B3HJK6	6	6
628879MS ④	B3HJK6	6	6
628880	B3HJL0	6	6
628881	B3HJT1	6	6
628882	B3HJT5	6	6
628883	B3HJX8	6	6
628884	B3HJY2	6	6
628885	B3HL48	6	6
628886	B3HL49	6	6
628889	B3HL56	6	6
628890	B3HL57	6	6
628891	B3HL58	6	6
628892	B3HL59	6	6
628893	B3HL60	6	6
628894	B3HL61	6	6
629081	B3HHPO	6	6
629084	B3HK74	6	6
629086	B3HK85	6	6
PB18C22JH2	NA	6	6
629428	B3HJN9	6	6
629428D	B3HJN9	6	6
629428MS ④	B3HJN9	6	6
629431	B3HL16	6	6
629454	B3HL78	6	6
629455	B3HL81	6	6
629456	B3HL82	6	6
PB18C22JH3	NA	6	6
628879-C	B3HJK6	6	6
628879D-C ④	B3HJK6	6	6
628879MS-C ⑤	B3HJK6	6	6
628880-C	B3HJL0	6	6
628881-C	B3HJT1	6	6
628882-C	B3HJT5	6	6
628883-C	B3HJX8	6	6
628884-C	B3HJY2	6	6
628885-C	B3HL48	6	6
628886-C	B3HL49	6	6
628889-C	B3HL56	6	6

Prepared by: HERRERA, JUDY

Date: 03/22/2018

Reviewed by: MOKEN, JAMES

Date: 03/27/2018

Disposal Int/Date/Loc: JM / 03/27/2018 / NA - Consumed

4/20/2018
Digestion Log

010112

REV.0

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180326-P001 (Ver. 3)
Status: DISPOSED

Client(s): CH2M Hill Plateau Remediation Company
Task Order(s): 180313-4, 180316-10, 180320-7, 180321-6
SDG(s): 628879, 629427
Project(s): 20859.01.00X
Method(s): CN prep (TAP: 01-0406-134)
Matrix(s): Water
Reagent(s): (CN) Releasing Reagent #150-01-WCS14, (CN) 1N NaOH #150-01-WCS14, (CN) 0.25N NaOH#149-01-WCS14
Pipette(s): 5000-12, 1000-1, 200-H
Heating Device: MIDI-STIL Temperature (C): 125C
Time In: 03/22/2018 10:52:51 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)
628890-C	B3HL57	6	6
628891-C	B3HL58	6	6
628892-C	B3HL59	6	6
628893-C	B3HL60	6	6
628894-C	B3HL61	6	6
629081-C	B3HHP0	6	6
629084-C	B3HK74	6	6
629086-C	B3HK85	6	6

- ① spiked 6 mL of CI# 91846 151-02-WCS14 (Lot# P249-502, Source: ERA, Exp: 07/31/2018)
- ② spiked 6 mL of 151-03-WCS14 (Lot# 94147, Source: ERA, Exp: 03/29/2018)
- ③ spiked 6 mL of 151-04-WCS14 (Lot# 94147, Source: ERA, Exp: 03/29/2018)
- ④ spiked 6 mL of Cyanid Spike (0.04 ppm) (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
- ⑤ spiked mL of Cyanid Spike (0.04 ppm) (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)

Comments:
All samples had a ph>12 (pH Lot#208515 Exp. date 03/30/18)
All samples had negative lead acetate and KI test papers (Lead Acetate #85205, KI#85038)

Distillation Start: 9:29 Stop: 9:59
Distillation Start: 10:07 Stop: 10:37
Distillation Start: 12:47 Stop: 13:17

Amenable Start: 10:53 Stop: 11:53

6 ml of Matrix Spikes prepared by:
Sample spikes = 0.020 ml of 100ppm Cyanide #125-02-WCS14 to final volume 50 ml with sample

Prepared by: HERRERA, JUDY

Date: 03/22/2018

Reviewed by: MOKEN, JAMES

Date: 03/27/2018

Disposal Int/Date/Loc: JM / 03/27/2018 / NA - Consumed

4/20/2018
Digestion Log

010113

REV.0

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180413-P004 (Ver. 1)
Status: CONSUMED

Client(s): CH2M Hill Plateau Remediation Company
 Task Order(s): 180323-3, 180328-8, 180330-6, 180403-4
 SDG(s): 629427, 629954
 Project(s): 20859.01.00X
 Method(s): CN prep (TAP: 01-0406-134)
 Matrix(s): Water
 Reagent(s): (CN) Releasing Agent #150-01-WCS14, (CN) 0.25N NaOH #109-02-WCS14, (CN) 1N NaOH #131-01-WCS14
 Pipette(s): 5000-12, 1000-1, 200-H
 Heating Device: MICRO-DIST Temperature (C): 120C
 Time In: 04/04/2018 09:28:35 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)
PB18D04JH2	NA	6	6
LCS18D04JH2 ①	NA	6	6
629564	B3HFP8	6	6
629565	B3HL80	6	6
629566	B3HL89	6	6
629662	B3HKKH5	6	6
629962D	B3HKJ3	6	6
629962S ②	B3HKJ3	6	6
629663	B3HKKH6	6	6
629837	B3HFT4	6	6
629954	B3HJY7	6	6
629954D	B3HJY7	6	6
629954S ②	B3HJY7	6	6
629955	B3HJY8	6	6
629956	B3HK00	6	6
629957	B3HK01	6	6
629958	B3HKKH8	6	6
629959	B3HKKH9	6	6
629960	B3HKJ0	6	6
629961	B3HKJ1	6	6
629962	B3HKJ3	6	6
629963	B3HKJ4	6	6
629964	B3HKJ6	6	6
629965	B3HKJ7	6	6
LCS18D04CS1 ③	NA	6	6
LCS18D04CS2 ④	NA	6	6
PB18D04JH3	NA	6	6
629662-C	B3HKKH5	6	6
629662D-C	B3HKKH5	6	6
629662S-C ②	B3HKKH5	6	6
629663-C	B3HKKH6	6	6
629954-C	B3HJY7	6	6
629954D-C	B3HJY7	6	6
629954S-C ②	B3HJY7	6	6
629955-C	B3HJY8	6	6
629956-C	B3HK00	6	6
629957-C	B3HK01	6	6
629958-C	B3HKKH8	6	6
629959-C	B3HKKH9	6	6
629960-C	B3HKJ0	6	6
629961-C	B3HKJ1	6	6
629962-C	B3HKJ3	6	6
629963-C	B3HKJ4	6	6

Prepared by: HERRERA, JUDY

Date: 04/04/2018

Reviewed by: MOKEN, JAMES

Date: 04/18/2018

Disposal Int/Date/Loc: JM / 04/18/2018 / NA - Consumed

4/20/2018
Digestion Log

010114

REV.0

Southwest Research Institute
San Antonio, Texas 78228

Batch: 20180413-P004 (Ver. 1)
Status: CONSUMED

Client(s): CH2M Hill Plateau Remediation Company
Task Order(s): 180323-3, 180328-8, 180330-6, 180403-4
SDG(s): 629427, 629954
Project(s): 20859.01.00X
Method(s): CN prep (TAP: 01-0406-134)
Matrix(s): Water
Reagent(s): (CN) Releasing Agent #150-01-WCS14, (CN) 0.25N NaOH #109-02-WCS14, (CN) 1N NaOH #131-01-WCS14
Pipette(s): 5000-12, 1000-1, 200-H
Heating Device: MICRO-DIST Temperature (C): 120C
Time In: 04/04/2018 09:28:35 Time Out: NA

Sample Identification	Client Identification	Initial Volume (mL)	Final Volume (mL)
629964-C	B3HKJ6	6	6
629965-C	B3HKJ7	6	6
PB18D04JH4	NA	6	6
PB18D04JH5	NA	6	6
LOQ1 ⑤	NA	6	6
LOQ2 ⑤	NA	6	6
LOQ3 ⑤	NA	6	6

- ① spiked 6 mL of CI# 91846 LCSW (Lot# P249-502, Source: ERA, Exp: 07/31/2018)
- ② spiked 6 mL of CN-Spike (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
- ③ spiked 6 mL of CN-LCSH (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
- ④ spiked 6 mL of CN-LCSL (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)
- ⑤ spiked 6 mL of LOQ-CN (Lot# 125-02-WCS14, Source: ERA, Exp: 10/31/2018)

Comments:

6 ml of Laboratory Control samples & Matrix Spikes prepared by:
1 LCSW = 0.250 ml of Total Cyanide #91846 to final volume 50 ml with 0.25N NaOH #149-01-02-WCS14
2 LCSH = 0.250 ml of 100ppm Cyanide #125-02-WCS14 to final volume 50 ml with 0.25N NaOH #149-01-WCS14
3 LCSL = 0.025 ml of 100ppm Cyanide #125-02-WCS14 to final volume 50 ml with 0.25N NaOH #149-01-WCS14
Sample spikes = 0.020 ml of 100ppm Cyanide #125-02-WCS14 to final volume 50 ml with sample

All samples had a pH > 12 (pH #89977 Exp. date 05/15/2020)
All samples had negative lead acetate and KI test papers (Lead Acetate #85205, KI#85038)

Distillation Start: 11:10 Stop: 11:40
Distillation Start: 13:46 Stop: 14:16
Distillation Start: 14:20 Stop: 14:50

Amenable Start: 11:24 Stop: 12:24

Prepared by: HERRERA, JUDY

Date: 04/04/2018

Reviewed by: MOKEN, JAMES

Date: 04/18/2018

Disposal Int/Date/Loc: JM / 04/18/2018 / NA - Consumed

SOUTHWEST RESEARCH INSTITUTE**CLIENT: CH2M Hill Plateau Remediation Company****SwRI PROJECT#: 20859.01.00X****SwRI TASK ORDER: 180320-7****SwRI SRR: 61374****SDG: 629427****VTSR: 03.20.2018****SW846 METHOD 8290A
Results**

Southwest Research Institute

Method 8290A Blank Summary

Blank ID: BLANK_05APR18

Project: 20859.01.00X

Lab Sample ID: 630222

CASE #: W18-003

Client: CH2M Hill Plateau Remediation Company

SDG: 629427

Matrix: Water

Analyzed: 10-Apr-18 18:48:46

This method blank applies to the following samples, MS, and MSD's

Client Sample ID	Lab Sample ID	Date Analyzed	File ID
LCS_05APR18	630223	4/10/2018	M04108M1_03
B3HJN4	629427	4/11/2018	M04118M1_02
B3HJN9	629428	4/11/2018	M04118M1_03
B3HK67	629429	4/11/2018	M04118M1_04
B3HK68	629430	4/11/2018	M04118M1_05
B3HK61	629441	4/11/2018	M04118M1_06
B3HJN4 MS	629427 MS	4/11/2018	M04118M1_07
B3HJN4 MSD	629427 MSD	4/11/2018	M04118M1_08

Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Sample ID

B3HJN4

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X

Case: W18-003

Date Received: 3/20/2018

SDG: 629427

Date Extracted: 4/5/2018

Matrix: Water

Date Analyzed: 4/11/2018

Sample Wt/Vol: 1.05 L

Concentration Unit: pg/L

Lab Sample ID: 629427

Lab File Name: M04118M1_02

Final Extraction Vol: 10 uL

Dilution Factor: 1.0

Split Factor: 1.0

Percent Dry: N/A

CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	9.52	U		1.40	9.52		
40321-76-4	1,2,3,7,8-PeCDD	23.8	U		1.81	23.8		
39227-28-6	1,2,3,4,7,8-HxCDD	23.8	U		2.02	23.8		
57653-85-7	1,2,3,6,7,8-HxCDD	23.8	U		1.21	23.8		
19408-74-3	1,2,3,7,8,9-HxCDD	23.8	U		1.62	23.8		
35822-46-9	1,2,3,4,6,7,8-HpCDD	23.8	U		1.53	23.8		
3268-87-9	OCDD	16.3	J			47.6	0.848	52.03
51207-31-9	2,3,7,8-TCDF	9.52	U		1.35	9.52		
57117-41-6	1,2,3,7,8-PeCDF	23.8	U		1.21	23.8		
57117-31-4	2,3,4,7,8-PeCDF	23.8	U		1.25	23.8		
70648-26-9	1,2,3,4,7,8-HxCDF	23.8	U		0.864	23.8		
57117-44-9	1,2,3,6,7,8-HxCDF	23.8	U		0.667	23.8		
72918-21-9	1,2,3,7,8,9-HxCDF	23.8	U		1.04	23.8		
60851-34-5	2,3,4,6,7,8-HxCDF	23.8	U		0.844	23.8		
67562-39-4	1,2,3,4,6,7,8-HpCDF	23.8	U		0.619	23.8		
55673-89-7	1,2,3,4,7,8,9-HpCDF	23.8	U		0.861	23.8		
39001-02-0	OCDF	47.6	U		2.90	47.6		

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins	9.52	U	Total Tetra-Furans	9.52	U
Total Penta-Dioxins	23.8	U	Total Penta-Furans	23.8	U
Total Hexa-Dioxins	23.8	U	Total Hexa-Furans	23.8	U
Total Hepta-Dioxins	23.8	U	Total Hepta-Furans	23.8	U

Internal Standard % Recovery

13C-2,3,7,8-TCDD	67.6	13C-1,2,3,4,7,8-HxCDF	105	13C-1,2,3,7,8-PeCDF	72.0
13C-1,2,3,6,7,8-HxCDD	88.2	13C-1,2,3,7,8-PeCDD	83.0	13C-1,2,3,4,6,7,8-HpCDF	104
13C-2,3,7,8-TCDF	82.8	13C-1,2,3,4,6,7,8-HpCDD	97.8	13C-OCDD	96.6

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	68.5
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Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X Case: W18-003 SDG: 629427 Matrix: Water Sample Wt/Vol: 1.05 L	Date Received: 3/20/2018 Date Extracted: 4/5/2018 Date Analyzed: 4/11/2018 Concentration Unit: pg/L	<div style="border: 1px solid black; padding: 2px; text-align: center;">Sample ID B3HJN4 MS</div> Lab Sample ID: 629427 MS Lab File Name: M04118M1_07 Final Extraction Vol: 10 uL Dilution Factor: 1.0 Split Factor: 1.0 Percent Dry: N/A
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CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	98.8				9.52	0.884	34.23
40321-76-4	1,2,3,7,8-PeCDD	244				23.8	1.55	41.34
39227-28-6	1,2,3,4,7,8-HxCDD	286				23.8	1.24	45.88
57653-85-7	1,2,3,6,7,8-HxCDD	241				23.8	1.29	45.98
19408-74-3	1,2,3,7,8,9-HxCDD	268				23.8	1.30	46.33
35822-46-9	1,2,3,4,6,7,8-HpCDD	208				23.8	1.17	49.31
3268-87-9	OCDD	432				47.6	0.970	52.02
51207-31-9	2,3,7,8-TCDF	94.8				9.52	0.743	33.07
57117-41-6	1,2,3,7,8-PeCDF	237				23.8	1.52	39.46
57117-31-4	2,3,4,7,8-PeCDF	254				23.8	1.46	40.73
70648-26-9	1,2,3,4,7,8-HxCDF	230				23.8	1.17	44.90
57117-44-9	1,2,3,6,7,8-HxCDF	210				23.8	1.18	45.02
72918-21-9	1,2,3,7,8,9-HxCDF	217				23.8	1.22	46.55
60851-34-5	2,3,4,6,7,8-HxCDF	216				23.8	1.07	45.71
67562-39-4	1,2,3,4,6,7,8-HpCDF	227				23.8	0.895	48.33
55673-89-7	1,2,3,4,7,8,9-HpCDF	233				23.8	1.09	49.66
39001-02-0	OCDF	443				47.6	0.901	52.14

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins			Total Tetra-Furans		
Total Penta-Dioxins			Total Penta-Furans		
Total Hexa-Dioxins			Total Hexa-Furans		
Total Hepta-Dioxins			Total Hepta-Furans		

Internal Standard % Recovery

13C-2,3,7,8-TCDD	82.1	13C-1,2,3,4,7,8-HxCDF	107	13C-1,2,3,7,8-PeCDF	91.6
13C-1,2,3,6,7,8-HxCDD	97.0	13C-1,2,3,7,8-PeCDD	91.7	13C-1,2,3,4,6,7,8-HpCDF	109
13C-2,3,7,8-TCDF	91.3	13C-1,2,3,4,6,7,8-HpCDD	124	13C-OCDD	96.8

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	79.3
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Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Sample ID

B3HJN4 MSD

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X
 Case: W18-003 Date Received: 3/20/2018
 SDG: 629427 Date Extracted: 4/5/2018
 Matrix: Water Date Analyzed: 4/11/2018
 Sample Wt/Vol: 1.06 L Concentration Unit: pg/L

Lab Sample ID: 629427 MSD
 Lab File Name: M04118M1_08
 Final Extraction Vol: 10 uL
 Dilution Factor: 1.0
 Split Factor: 1.0
 Percent Dry: N/A

CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	99.2				9.43	0.756	34.23
40321-76-4	1,2,3,7,8-PeCDD	250				23.6	1.65	41.34
39227-28-6	1,2,3,4,7,8-HxCDD	282				23.6	1.33	45.87
57653-85-7	1,2,3,6,7,8-HxCDD	244				23.6	1.29	45.97
19408-74-3	1,2,3,7,8,9-HxCDD	265				23.6	1.23	46.33
35822-46-9	1,2,3,4,6,7,8-HpCDD	234				23.6	1.11	49.31
3268-87-9	OCDD	428				47.2	0.932	52.02
51207-31-9	2,3,7,8-TCDF	102				9.43	0.794	33.07
57117-41-6	1,2,3,7,8-PeCDF	239				23.6	1.60	39.46
57117-31-4	2,3,4,7,8-PeCDF	246				23.6	1.52	40.73
70648-26-9	1,2,3,4,7,8-HxCDF	236				23.6	1.15	44.89
57117-44-9	1,2,3,6,7,8-HxCDF	232				23.6	1.13	45.02
72918-21-9	1,2,3,7,8,9-HxCDF	239				23.6	1.12	46.54
60851-34-5	2,3,4,6,7,8-HxCDF	233				23.6	1.18	45.70
67562-39-4	1,2,3,4,6,7,8-HpCDF	233				23.6	0.985	48.31
55673-89-7	1,2,3,4,7,8,9-HpCDF	247				23.6	1.08	49.66
39001-02-0	OCDF	428				47.2	0.852	52.13

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins			Total Tetra-Furans		
Total Penta-Dioxins			Total Penta-Furans		
Total Hexa-Dioxins			Total Hexa-Furans		
Total Hepta-Dioxins			Total Hepta-Furans		

Internal Standard % Recovery

13C-2,3,7,8-TCDD	85.2	13C-1,2,3,4,7,8-HxCDF	121	13C-1,2,3,7,8-PeCDF	91.1
13C-1,2,3,6,7,8-HxCDD	108	13C-1,2,3,7,8-PeCDD	88.8	13C-1,2,3,4,6,7,8-HpCDF	125
13C-2,3,7,8-TCDF	84.0	13C-1,2,3,4,6,7,8-HpCDD	111	13C-OCDD	125

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	81.9
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Southwest Research Institute

Matrix Spike Evaluation Form

Client ID: CH2M Hill Plateau Remediation Lab Sample ID: 629427 MS

Project: 20859.01.00X

Case: W18-003

Sample ID: B3HJN4 MS

Matrix: Water

Sample Wt/Vol: 1.05 L

Final Extraction Vol: 10 uL

Concentration Unit: pg/L

ANALYTE	Amount Added	Amount Unspiked Sample	Amount Detected	Amount Recovered	% Recovery	Target Recovery (Advisory)
2,3,7,8-TCDD	95.2	0	98.8	98.8	104	71 - 125
1,2,3,7,8-PeCDD	238	0	244	244	103	76 - 121
1,2,3,4,7,8-HxCDD	238	0	286	286	120	80 - 126
1,2,3,6,7,8-HxCDD	238	0	241	241	101	78 - 134
1,2,3,7,8,9-HxCDD	238	0	268	268	113	76 - 137
1,2,3,4,6,7,8-HpCDD	238	0	208	208	87.4	79 - 122
OCDD	476	16.3	432	416	87.4	81 - 135
2,3,7,8-TCDF	95.2	0	94.8	94.8	99.6	72 - 138
1,2,3,7,8-PeCDF	238	0	237	237	99.6	82 - 130
2,3,4,7,8-PeCDF	238	0	254	254	107	77 - 129
1,2,3,4,7,8-HxCDF	238	0	230	230	96.6	80 - 130
1,2,3,6,7,8-HxCDF	238	0	210	210	88.2	79 - 131
1,2,3,7,8,9-HxCDF	238	0	217	217	91.2	83 - 130
2,3,4,6,7,8-HxCDF	238	0	216	216	90.8	81 - 130
1,2,3,4,6,7,8-HpCDF	238	0	227	227	95.4	81 - 130
1,2,3,4,7,8,9-HpCDF	238	0	233	233	97.9	77 - 128
OCDF	476	0	443	443	93.1	66 - 150

Southwest Research Institute

Matrix Spike Evaluation Form

Client ID: CH2M Hill Plateau Remediation Lab Sample ID: 629427 MSD

Project: 20859.01.00X

Case: W18-003

Sample ID: B3HJN4 MSD

Matrix: Water

Sample Wt/Vol: 1.06 L

Final Extraction Vol: 10 uL

Concentration Unit: pg/L

ANALYTE	Amount Added	Amount Unspiked Sample	Amount Detected	Amount Recovered	% Recovery	Target Recovery (Advisory)
2,3,7,8-TCDD	94.3	0	99.2	99.2	105	71 - 125
1,2,3,7,8-PeCDD	236	0	250	250	106	76 - 121
1,2,3,4,7,8-HxCDD	236	0	282	282	119	80 - 126
1,2,3,6,7,8-HxCDD	236	0	244	244	103	78 - 134
1,2,3,7,8,9-HxCDD	236	0	265	265	112	76 - 137
1,2,3,4,6,7,8-HpCDD	236	0	234	234	99.2	79 - 122
OCDD	472	16.3	428	412	87.3	81 - 135
2,3,7,8-TCDF	94.3	0	102	102	108	72 - 138
1,2,3,7,8-PeCDF	236	0	239	239	101	82 - 130
2,3,4,7,8-PeCDF	236	0	246	246	104	77 - 129
1,2,3,4,7,8-HxCDF	236	0	236	236	100	80 - 130
1,2,3,6,7,8-HxCDF	236	0	232	232	98.3	79 - 131
1,2,3,7,8,9-HxCDF	236	0	239	239	101	83 - 130
2,3,4,6,7,8-HxCDF	236	0	233	233	98.7	81 - 130
1,2,3,4,6,7,8-HpCDF	236	0	233	233	98.7	81 - 130
1,2,3,4,7,8,9-HpCDF	236	0	247	247	105	77 - 128
OCDF	472	0	428	428	90.7	66 - 150

Southwest Research Institute

Duplicate Sample Evaluation

Client ID: CH2M Hill Plateau Remediation Comp: Lab Sample ID: 629427

Project: 20859.01.00X

Case: W18-003

Sample ID: B3HJN4

Matrix: Water

Sample Wt/Vol: 1.06 L

Final Extraction Vol: 10 uL

Concentration Unit: pg/L

CAS No.	ANALYTE	% Recovery from Sample (MS)	% Recovery from Sample (MSD)	RPD	QC RPD Limit
1746-01-6	2,3,7,8-TCDD	104	105	0.957	20
40321-76-4	1,2,3,7,8-PeCDD	103	106	2.87	20
39227-28-6	1,2,3,4,7,8-HxCDD	120	119	0.837	20
57653-85-7	1,2,3,6,7,8-HxCDD	101	103	1.96	20
19408-74-3	1,2,3,7,8,9-HxCDD	113	112	0.889	20
35822-46-9	1,2,3,4,6,7,8-HpCDD	87.4	99.2	12.6	20
3268-87-9	OCDD	87.4	87.3	0.114	20
51207-31-9	2,3,7,8-TCDF	99.6	108	8.09	20
57117-41-6	1,2,3,7,8-PeCDF	99.6	101	1.40	20
57117-31-4	2,3,4,7,8-PeCDF	107	104	2.84	20
70648-26-9	1,2,3,4,7,8-HxCDF	96.6	100	3.46	20
57117-44-9	1,2,3,6,7,8-HxCDF	88.2	98.3	10.8	20
72918-21-9	1,2,3,7,8,9-HxCDF	91.2	101	10.2	20
60851-34-5	2,3,4,6,7,8-HxCDF	90.8	98.7	8.34	20
67562-39-4	1,2,3,4,6,7,8-HpCDF	95.4	98.7	3.40	20
55673-89-7	1,2,3,4,7,8,9-HpCDF	97.9	105	7.00	20
39001-02-0	OCDF	93.1	90.7	2.61	20

Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Sample ID

B3HJN9

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X

Lab Sample ID: 629428

Case: W18-003

Date Received: 3/20/2018

Lab File Name: M04118M1_03

SDG: 629427

Date Extracted: 4/5/2018

Final Extraction Vol: 10 uL

Matrix: Water

Date Analyzed: 4/11/2018

Dilution Factor: 1.0

Sample Wt/Vol: 1.05 L

Concentration Unit: pg/L

Split Factor: 1.0

Percent Dry: N/A

CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	9.52	U		1.56	9.52		
40321-76-4	1,2,3,7,8-PeCDD	23.8	U		1.09	23.8		
39227-28-6	1,2,3,4,7,8-HxCDD	23.8	U		1.41	23.8		
57653-85-7	1,2,3,6,7,8-HxCDD	23.8	U		0.846	23.8		
19408-74-3	1,2,3,7,8,9-HxCDD	23.8	U		1.13	23.8		
35822-46-9	1,2,3,4,6,7,8-HpCDD	23.8	U		1.62	23.8		
3268-87-9	OCDD	6.21	J			47.6	0.988	52.02
51207-31-9	2,3,7,8-TCDF	9.52	U		1.04	9.52		
57117-41-6	1,2,3,7,8-PeCDF	23.8	U		1.19	23.8		
57117-31-4	2,3,4,7,8-PeCDF	23.8	U		1.24	23.8		
70648-26-9	1,2,3,4,7,8-HxCDF	23.8	U		0.980	23.8		
57117-44-9	1,2,3,6,7,8-HxCDF	23.8	U		0.757	23.8		
72918-21-9	1,2,3,7,8,9-HxCDF	23.8	U		1.18	23.8		
60851-34-5	2,3,4,6,7,8-HxCDF	23.8	U		0.958	23.8		
67562-39-4	1,2,3,4,6,7,8-HpCDF	23.8	U		0.578	23.8		
55673-89-7	1,2,3,4,7,8,9-HpCDF	23.8	U		0.805	23.8		
39001-02-0	OCDF	47.6	U		1.57	47.6		

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins	9.52	U	Total Tetra-Furans	9.52	U
Total Penta-Dioxins	23.8	U	Total Penta-Furans	23.8	U
Total Hexa-Dioxins	23.8	U	Total Hexa-Furans	23.8	U
Total Hepta-Dioxins	23.8	U	Total Hepta-Furans	23.8	U

Internal Standard % Recovery

13C-2,3,7,8-TCDD	79.1	13C-1,2,3,4,7,8-HxCDF	110	13C-1,2,3,7,8-PeCDF	85.7
13C-1,2,3,6,7,8-HxCDD	96.2	13C-1,2,3,7,8-PeCDD	90.5	13C-1,2,3,4,6,7,8-HpCDF	103
13C-2,3,7,8-TCDF	84.3	13C-1,2,3,4,6,7,8-HpCDD	115	13C-OCDD	97.9

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	75.0
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Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Sample ID

B3HK67

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X
 Case: W18-003 Date Received: 3/20/2018
 SDG: 629427 Date Extracted: 4/5/2018
 Matrix: Water Date Analyzed: 4/11/2018
 Sample Wt/Vol: 1.04 L Concentration Unit: pg/L

Lab Sample ID: 629429
 Lab File Name: M04118M1_04
 Final Extraction Vol: 10 uL
 Dilution Factor: 1.0
 Split Factor: 1.0
 Percent Dry: N/A

CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	9.62	U		1.25	9.62		
40321-76-4	1,2,3,7,8-PeCDD	24.0	U		1.37	24.0		
39227-28-6	1,2,3,4,7,8-HxCDD	24.0	U		1.11	24.0		
57653-85-7	1,2,3,6,7,8-HxCDD	24.0	U	0.324		24.0		
19408-74-3	1,2,3,7,8,9-HxCDD	24.0	U		0.890	24.0		
35822-46-9	1,2,3,4,6,7,8-HpCDD	24.0	U		1.33	24.0		
3268-87-9	OCDD	48.1	U		1.33	48.1		
51207-31-9	2,3,7,8-TCDF	9.62	U		1.01	9.62		
57117-41-6	1,2,3,7,8-PeCDF	24.0	U		0.880	24.0		
57117-31-4	2,3,4,7,8-PeCDF	24.0	U		0.913	24.0		
70648-26-9	1,2,3,4,7,8-HxCDF	24.0	U		0.772	24.0		
57117-44-9	1,2,3,6,7,8-HxCDF	24.0	U		0.596	24.0		
72918-21-9	1,2,3,7,8,9-HxCDF	24.0	U		0.926	24.0		
60851-34-5	2,3,4,6,7,8-HxCDF	24.0	U		0.755	24.0		
67562-39-4	1,2,3,4,6,7,8-HpCDF	24.0	U		0.494	24.0		
55673-89-7	1,2,3,4,7,8,9-HpCDF	24.0	U		0.689	24.0		
39001-02-0	OCDF	48.1	U		1.62	48.1		

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins	9.62	U	Total Tetra-Furans	9.62	U
Total Penta-Dioxins	24.0	U	Total Penta-Furans	24.0	U
Total Hexa-Dioxins	24.0	U	Total Hexa-Furans	24.0	U
Total Hepta-Dioxins	24.0	U	Total Hepta-Furans	24.0	U

Internal Standard % Recovery

13C-2,3,7,8-TCDD	74.7	13C-1,2,3,4,7,8-HxCDF	115	13C-1,2,3,7,8-PeCDF	79.3
13C-1,2,3,6,7,8-HxCDD	89.4	13C-1,2,3,7,8-PeCDD	82.0	13C-1,2,3,4,6,7,8-HpCDF	97.0
13C-2,3,7,8-TCDF	83.0	13C-1,2,3,4,6,7,8-HpCDD	103	13C-OCDD	96.5

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	69.6
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Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Sample ID

B3HK68

Client ID: CH2M Hill Plateau Remediat Project: 20859.01.00X

Case: W18-003

SDG: 629427

Matrix: Water

Sample Wt/Vol: 1.05 L

Date Received: 3/20/2018

Date Extracted: 4/5/2018

Date Analyzed: 4/11/2018

Concentration Unit: pg/L

Lab Sample ID: 629430

Lab File Name: M04118M1_05

Final Extraction Vol: 10 uL

Dilution Factor: 1.0

Split Factor: 1.0

Percent Dry: N/A

CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	9.52	U		1.44	9.52		
40321-76-4	1,2,3,7,8-PeCDD	23.8	U		1.17	23.8		
39227-28-6	1,2,3,4,7,8-HxCDD	23.8	U		1.60	23.8		
57653-85-7	1,2,3,6,7,8-HxCDD	23.8	U		0.963	23.8		
19408-74-3	1,2,3,7,8,9-HxCDD	23.8	U		1.29	23.8		
35822-46-9	1,2,3,4,6,7,8-HpCDD	23.8	U		0.745	23.8		
3268-87-9	OCDD	47.6	U		3.11	47.6		
51207-31-9	2,3,7,8-TCDF	9.52	U		0.639	9.52		
57117-41-6	1,2,3,7,8-PeCDF	23.8	U		0.729	23.8		
57117-31-4	2,3,4,7,8-PeCDF	23.8	U		0.757	23.8		
70648-26-9	1,2,3,4,7,8-HxCDF	23.8	U		0.484	23.8		
57117-44-9	1,2,3,6,7,8-HxCDF	23.8	U		0.374	23.8		
72918-21-9	1,2,3,7,8,9-HxCDF	23.8	U		0.581	23.8		
60851-34-5	2,3,4,6,7,8-HxCDF	23.8	U		0.474	23.8		
67562-39-4	1,2,3,4,6,7,8-HpCDF	23.8	U		0.364	23.8		
55673-89-7	1,2,3,4,7,8,9-HpCDF	23.8	U		0.506	23.8		
39001-02-0	OCDF	47.6	U		1.51	47.6		

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins	9.52	U	Total Tetra-Furans	9.52	U
Total Penta-Dioxins	23.8	U	Total Penta-Furans	23.8	U
Total Hexa-Dioxins	23.8	U	Total Hexa-Furans	23.8	U
Total Hepta-Dioxins	23.8	U	Total Hepta-Furans	23.8	U

Internal Standard % Recovery

13C-2,3,7,8-TCDD	78.1	13C-1,2,3,4,7,8-HxCDF	111	13C-1,2,3,7,8-PeCDF	88.2
13C-1,2,3,6,7,8-HxCDD	92.3	13C-1,2,3,7,8-PeCDD	89.3	13C-1,2,3,4,6,7,8-HpCDF	104
13C-2,3,7,8-TCDF	84.5	13C-1,2,3,4,6,7,8-HpCDD	109	13C-OCDD	94.5

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	82.0
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Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Sample ID

B3HK61

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X

Case: W18-003

Date Received: 3/20/2018

SDG: 629427

Date Extracted: 4/5/2018

Matrix: Water

Date Analyzed: 4/11/2018

Sample Wt/Vol: 1.05 L

Concentration Unit: pg/L

Lab Sample ID: 629441

Lab File Name: M04118M1_06

Final Extraction Vol: 10 uL

Dilution Factor: 1.0

Split Factor: 1.0

Percent Dry: N/A

CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	9.52	U		1.24	9.52		
40321-76-4	1,2,3,7,8-PeCDD	23.8	U		0.726	23.8		
39227-28-6	1,2,3,4,7,8-HxCDD	23.8	U		1.37	23.8		
57653-85-7	1,2,3,6,7,8-HxCDD	23.8	U		0.824	23.8		
19408-74-3	1,2,3,7,8,9-HxCDD	23.8	U		1.10	23.8		
35822-46-9	1,2,3,4,6,7,8-HpCDD	23.8	U		1.03	23.8		
3268-87-9	OCDD	47.6	U		0.959	47.6		
51207-31-9	2,3,7,8-TCDF	9.52	U		0.855	9.52		
57117-41-6	1,2,3,7,8-PeCDF	23.8	U		0.693	23.8		
57117-31-4	2,3,4,7,8-PeCDF	23.8	U		0.719	23.8		
70648-26-9	1,2,3,4,7,8-HxCDF	23.8	U		0.557	23.8		
57117-44-9	1,2,3,6,7,8-HxCDF	23.8	U		0.430	23.8		
72918-21-9	1,2,3,7,8,9-HxCDF	23.8	U		0.668	23.8		
60851-34-5	2,3,4,6,7,8-HxCDF	23.8	U		0.544	23.8		
67562-39-4	1,2,3,4,6,7,8-HpCDF	23.8	U		0.542	23.8		
55673-89-7	1,2,3,4,7,8,9-HpCDF	23.8	U		0.754	23.8		
39001-02-0	OCDF	47.6	U		1.55	47.6		

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins	9.52	U	Total Tetra-Furans	9.52	U
Total Penta-Dioxins	23.8	U	Total Penta-Furans	23.8	U
Total Hexa-Dioxins	23.8	U	Total Hexa-Furans	23.8	U
Total Hepta-Dioxins	23.8	U	Total Hepta-Furans	23.8	U

Internal Standard % Recovery

13C-2,3,7,8-TCDD	72.1	13C-1,2,3,4,7,8-HxCDF	111	13C-1,2,3,7,8-PeCDF	80.5
13C-1,2,3,6,7,8-HxCDD	102	13C-1,2,3,7,8-PeCDD	85.5	13C-1,2,3,4,6,7,8-HpCDF	109
13C-2,3,7,8-TCDF	82.0	13C-1,2,3,4,6,7,8-HpCDD	120	13C-OCDD	110

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	76.3
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Southwest Research Institute

Method 8290A PCDD/PCDF Analysis Report

Sample ID

BLANK_05APR18

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X

Case: W18-003

Date Received: N/A

Lab Sample ID: 630222

SDG: 629427

Date Extracted: 4/5/2018

Lab File Name: M04108M1_02

Matrix: Water

Date Analyzed: 4/10/2018

Final Extraction Vol: 10 uL

Sample Wt/Vol: 1.00 L

Concentration Unit: pg/L

Dilution Factor: 1.0

Split Factor: 1.0

Percent Dry: N/A

CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	10.0	U		2.02	10.0		
40321-76-4	1,2,3,7,8-PeCDD	25.0	U		1.61	25.0		
39227-28-6	1,2,3,4,7,8-HxCDD	25.0	U		2.77	25.0		
57653-85-7	1,2,3,6,7,8-HxCDD	25.0	U		1.67	25.0		
19408-74-3	1,2,3,7,8,9-HxCDD	25.0	U		2.23	25.0		
35822-46-9	1,2,3,4,6,7,8-HpCDD	25.0	U		1.83	25.0		
3268-87-9	OCDD	50.0	U		2.39	50.0		
51207-31-9	2,3,7,8-TCDF	10.0	U		1.61	10.0		
57117-41-6	1,2,3,7,8-PeCDF	25.0	U		1.54	25.0		
57117-31-4	2,3,4,7,8-PeCDF	25.0	U		1.60	25.0		
70648-26-9	1,2,3,4,7,8-HxCDF	25.0	U		2.11	25.0		
57117-44-9	1,2,3,6,7,8-HxCDF	25.0	U		1.63	25.0		
72918-21-9	1,2,3,7,8,9-HxCDF	25.0	U		2.53	25.0		
60851-34-5	2,3,4,6,7,8-HxCDF	25.0	U		2.06	25.0		
67562-39-4	1,2,3,4,6,7,8-HpCDF	25.0	U		1.04	25.0		
55673-89-7	1,2,3,4,7,8,9-HpCDF	25.0	U		1.45	25.0		
39001-02-0	OCDF	50.0	U		2.76	50.0		

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins	10.0	U	Total Tetra-Furans	10.0	U
Total Penta-Dioxins	25.0	U	Total Penta-Furans	25.0	U
Total Hexa-Dioxins	25.0	U	Total Hexa-Furans	25.0	U
Total Hepta-Dioxins	25.0	U	Total Hepta-Furans	25.0	U

Internal Standard % Recovery

13C-2,3,7,8-TCDD	84.7	13C-1,2,3,4,7,8-HxCDF	109	13C-1,2,3,7,8-PeCDF	92.7
13C-1,2,3,6,7,8-HxCDD	99.4	13C-1,2,3,7,8-PeCDD	89.3	13C-1,2,3,4,6,7,8-HpCDF	113
13C-2,3,7,8-TCDF	101	13C-1,2,3,4,6,7,8-HpCDD	88.0	13C-OCDD	123

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD 91.7

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Method 8290A PCDD/PCDF Analysis Report

Client ID: CH2M Hill Plateau RemediatProject: 20859.01.00X Case: W18-003 SDG: 629427 Matrix: Water Sample Wt/Vol: 1.00 L	Date Received: N/A Date Extracted: 4/5/2018 Date Analyzed: 4/10/2018 Concentration Unit: pg/L	<div style="border: 1px solid black; padding: 2px; text-align: center;">Sample ID LCS_05APR18</div> Lab Sample ID: 630223 Lab File Name: M04108M1_03 Final Extraction Vol: 10 uL Dilution Factor: 1.0 Split Factor: 1.0 Percent Dry: N/A
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CAS No.	ANALYTE	CONC	Q	EMPC	EDL	CRQL	RATIO	RT
1746-01-6	2,3,7,8-TCDD	112				10.0	0.770	34.23
40321-76-4	1,2,3,7,8-PeCDD	233				25.0	1.78	41.34
39227-28-6	1,2,3,4,7,8-HxCDD	312				25.0	1.20	45.88
57653-85-7	1,2,3,6,7,8-HxCDD	252				25.0	1.26	45.98
19408-74-3	1,2,3,7,8,9-HxCDD	242				25.0	1.39	46.34
35822-46-9	1,2,3,4,6,7,8-HpCDD	219				25.0	1.05	49.31
3268-87-9	OCDD	454				50.0	0.918	52.02
51207-31-9	2,3,7,8-TCDF	101				10.0	0.812	33.07
57117-41-6	1,2,3,7,8-PeCDF	255				25.0	1.63	39.46
57117-31-4	2,3,4,7,8-PeCDF	250				25.0	1.54	40.73
70648-26-9	1,2,3,4,7,8-HxCDF	248				25.0	1.07	44.90
57117-44-9	1,2,3,6,7,8-HxCDF	238				25.0	1.14	45.02
72918-21-9	1,2,3,7,8,9-HxCDF	222				25.0	1.24	46.55
60851-34-5	2,3,4,6,7,8-HxCDF	246				25.0	1.08	45.71
67562-39-4	1,2,3,4,6,7,8-HpCDF	247				25.0	1.12	48.33
55673-89-7	1,2,3,4,7,8,9-HpCDF	232				25.0	1.01	49.66
39001-02-0	OCDF	486				50.0	0.855	52.13

Total Dioxin	CONC	Q	Total Dibenzofuran	CONC	Q
Total Tetra-Dioxins			Total Tetra-Furans		
Total Penta-Dioxins			Total Penta-Furans		
Total Hexa-Dioxins			Total Hexa-Furans		
Total Hepta-Dioxins			Total Hepta-Furans		

Internal Standard % Recovery

13C-2,3,7,8-TCDD	80.5	13C-1,2,3,4,7,8-HxCDF	118	13C-1,2,3,7,8-PeCDF	84.7
13C-1,2,3,6,7,8-HxCDD	104	13C-1,2,3,7,8-PeCDD	86.7	13C-1,2,3,4,6,7,8-HpCDF	119
13C-2,3,7,8-TCDF	89.1	13C-1,2,3,4,6,7,8-HpCDD	123	13C-OCDD	102

Clean-Up Standard % Recovery

37Cl-2,3,7,8-TCDD	75.8
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Matrix Spike Evaluation Form

Client ID: CH2M Hill Plateau Remediation Lab Sample ID: 630223

Project: 20859.01.00X

Case: W18-003

Sample ID: LCS_05APR18

Matrix: Water

Sample Wt/Vol: 1.00 L

Final Extraction Vol: 10 uL

Concentration Unit: pg/L

ANALYTE	Amount Added	Amount Unspiked Sample	Amount Detected	Amount Recovered	% Recovery	Target Recovery (Advisory)
2,3,7,8-TCDD	100	0	112	112	112	71 - 125
1,2,3,7,8-PeCDD	250	0	233	233	93.2	76 - 121
1,2,3,4,7,8-HxCDD	250	0	312	312	125	80 - 126
1,2,3,6,7,8-HxCDD	250	0	252	252	101	78 - 134
1,2,3,7,8,9-HxCDD	250	0	242	242	96.8	76 - 137
1,2,3,4,6,7,8-HpCDD	250	0	219	219	87.6	79 - 122
OCDD	500	0	454	454	90.8	81 - 135
2,3,7,8-TCDF	100	0	101	101	101	72 - 138
1,2,3,7,8-PeCDF	250	0	255	255	102	82 - 130
2,3,4,7,8-PeCDF	250	0	250	250	100	77 - 129
1,2,3,4,7,8-HxCDF	250	0	248	248	99.2	80 - 130
1,2,3,6,7,8-HxCDF	250	0	238	238	95.2	79 - 131
1,2,3,7,8,9-HxCDF	250	0	222	222	88.8	83 - 130
2,3,4,6,7,8-HxCDF	250	0	246	246	98.4	81 - 130
1,2,3,4,6,7,8-HpCDF	250	0	247	247	98.8	81 - 130
1,2,3,4,7,8,9-HpCDF	250	0	232	232	92.8	77 - 128
OCDF	500	0	486	486	97.2	66 - 150

SOUTHWEST RESEARCH INSTITUTE
CLIENT: CH2M Hill Plateau Remediation Company
SwRI PROJECT#: 20859.01.00X
SwRI TASK ORDER: 180320-7
SwRI SRR: 61374
SDG: 629427
VTSR: 03.20.2018

SW846 METHOD 8290A

Injection Log

112 TITLE

CH2M HILL PRC

PROJECT NO. 20859.01.00X

TO: 180316-10

BOOK NO.

Tom Jones
4/11/18

INSTRUMENT ID: AutoSpec M BOOK NO: [17-0402-008] METHOD: 8290A/1613/23

COLUMN: ZB-5 60mX0.32mm id, 0.25µm film COLUMN FLOW: 1.3 mL/min

CTC AUTOSAMPLER TRAY TEMP: 25 deg C

TEMP-1: 120 deg C TIME-2: 15 min RATE-3 : 15deg/min SOURCE TEMP : 275 deg C

TIME-1: 3.0 min RATE-2: 3.0 deg/min TEMP-4 : 320 deg C INTERFACE TEMP : 270 deg C

RATE-1: 10deg/min TEMP-3: 255 deg C TIME-4 : 5 min ELECTRON ENERGY: 40eV

TEMP-2: 215 deg C TIME-3: 0 min INJ TEMP: 275 deg C SPLIT VALVE ON : 0.75 min

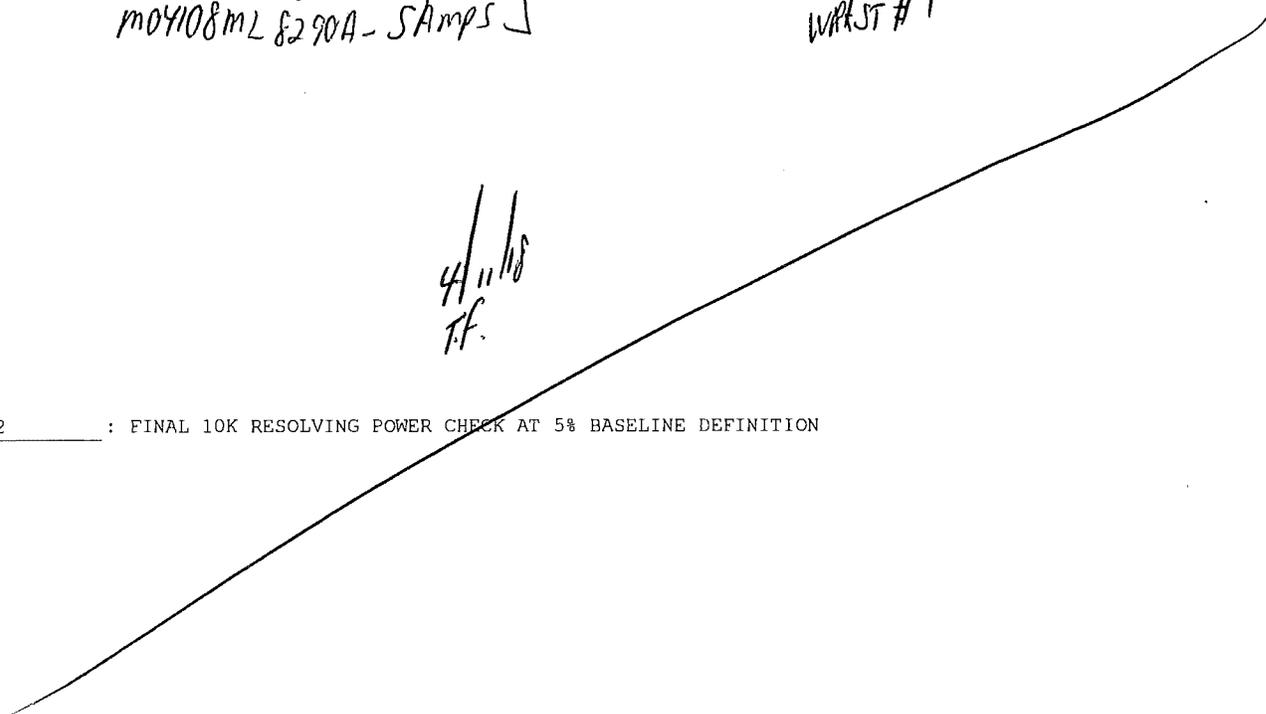
MO4108C1 : INITIAL 10K RESOLVING POWER CHECK AT 5% BASELINE DEFINITION

FILENAME	Date	Time	SAMPLE TEXT
MO4108M1_W1	10-Apr-18	11:21	WDM COLUMN PERFORMANCE STD (53544)
MO4108M1_S1	10-Apr-18	12:15	ICAL: 8290 CS5 200 PG/UL (410-02-01-15)
MO4108M1_S2	10-Apr-18	13:11	ICAL: 8290 CS4 40 PG/UL (410-03-01-15)
MO4108M1_S3	10-Apr-18	14:06	ICAL: 8290 CS3 10 PG/UL (487-01-01-16)
MO4108M1_S4	10-Apr-18	15:02	ICAL: 8290 CS2 2.5 PG/UL (410-04-01-15)
MO4108M1_S5	10-Apr-18	16:02	ICAL: 8290 CS1 1.0 PG/UL (53422)
MO4108M1_S6	10-Apr-18	16:56	ICAL: 8290 CS1A 0.5 PG/UL (59124)
MO4108M1_01	10-Apr-18	17:52	INST BLK_10APR18
MO4108M1_02	10-Apr-18	18:48	CH2M: BLANK_05APR18 SN:630222
MO4108M1_03	10-Apr-18	19:44	CH2M: LCS_05APR18 SN:630223
MO4108M1_S7	10-Apr-18	20:40	ICV: 8290 CS3 10 PG/UL (409-03-01-15)

SAVED AS MO4108M1-8290A-ICAL
 MO4108M1-8290A-ICV [INC.] MASS/MS DIOXIN-2018. PRO
 MO4108M2 8290A-SAMPS WPKST #1

4/11/18
T.F.

MO4108C2 : FINAL 10K RESOLVING POWER CHECK AT 5% BASELINE DEFINITION



SIGNATURE

DATE

4/10/18

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

Shreshtha Dandekar

4/10/18

114 TITLE

CH2M HILL PRC
TO: 180320-7

PROJECT NO. 20859.01.00X
BOOK NO.

Thomas Jordan 4/12/18

INSTRUMENT ID: AutoSpec M BOOK NO: [17-0402-008] METHOD: 8290A/1613/23

COLUMN: ZB-5 60mX0.32mm id, 0.25µm film COLUMN FLOW: 1.3 mL/min

CTC AUTOSAMPLER TRAY TEMP: 25 deg C

TEMP-1: 120 deg C TIME-2: 15 min RATE-3 : 15deg/min SOURCE TEMP : 275 deg C

TIME-1: 3.0 min RATE-2: 3.0 deg/min TEMP-4 : 320 deg C INTERFACE TEMP : 270 deg C

RATE-1: 10deg/min TEMP-3: 255 deg C TIME-4 : 5 min ELECTRON ENERGY: 40eV

TEMP-2: 215 deg C TIME-3: 0 min INJ TEMP: 275 deg C SPLIT VALVE ON : 0.75 min

MO4118C1 : INITIAL 10K RESOLVING POWER CHECK AT 5% BASELINE DEFINITION

FILENAME	Date	Time	SAMPLE TEXT
MO4118M1_W1	11-Apr-18	11:44	WDM COLUMN PERFORMANCE STD (53544)
MO4118M1_S1	11-Apr-18	12:38	VER: 8290 CS3 10 PG/UL (487-01-01-16)
MO4118M1_01	11-Apr-18	13:34	INST BLK_11APR18
MO4118M1_02	11-Apr-18	14:30	CH2M: B3HJN4 SN:629427
MO4118M1_03	11-Apr-18	15:26	CH2M: B3HJN9 SN:629428
MO4118M1_04	11-Apr-18	16:22	CH2M: B3HK67 SN:629429
MO4118M1_05	11-Apr-18	17:18	CH2M: B3HK68 SN:629430
MO4118M1_06	11-Apr-18	18:14	CH2M: B3HK61 SN:629441
MO4118M1_07	11-Apr-18	19:10	CH2M: B3HJN4 MS SN:629427 MS
MO4118M1_08	11-Apr-18	20:05	CH2M: B3HJN4 MSD SN:629427 MSD
MO4118M1_S2	11-Apr-18	21:01	VER: 8290 CS3 10 PG/UL (487-01-01-16)

SAVED AS MO4118M1_8290A_VER_SAMPS IN C:\mass\prx\picxin_2018.PRO
WPKJTH

4/12/18
TF.

MO4118C2 : FINAL 10K RESOLVING POWER CHECK AT 5% BASELINE DEFINITION

SIGNATURE

DATE

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

SOUTHWEST RESEARCH INSTITUTE**CLIENT: CH2M Hill Plateau Remediation Company****SwRI PROJECT#: 20859.01.00X****SwRI TASK ORDER: 180320-7****SwRI SRR: 61374****SDG: 629427****VTSR: 03.20.2018****SW846 METHOD 8290A
Extraction Form**



(E8290W) Dioxin Water Extraction By Sep-Funnel 3510C (CH2M)

SwRI Labs

Client: CH2M Hill Plateau Remediation Company

Project: 20859.01.00X

Case: W18-003

Sample Receipt: 61374

TO#: 180320-7

DATE EXTRACTED	04/05/18
ANALYSTS INVOLVED	Hamed Edrisi (SU,SP,EXT) Christina Menn (SU,SW,EXT,BD,QT,FV) Marina Lebron (EXT,Conc,QT) Ronald Douglas (EXT,sp-cu,CU,)
SURROGATE SOL. ID	517-01-01-17@50/125/250pg/uL
MTX SPK SOL. ID	521-01-01-18@10/25/50pg/uL
CLEAN UP STD ID	508-01-01-17@4.0pg/uL ** 489-01-01-17 @4.0pg/uL
EXTRACTS LOCATION	Tracked by LIMS (04/06/18 CM)
CHEMICAL, BRAND, & LOT#	Ozarka water ID:04-0402-003p25O5 Sodium Sulfate ID:04-0402-004P29S DCM Fisher Optima Lot#179197 Hexane Fisher Optima Lot#174498 Sulfuric Acid Fisher Lot#171338 Acidified Silica Gel ID:09-0402-004p197C MP N-Super I Alumina Lot#16(85218)

NOTES	Hamilton CO. Syringes 25uL ID#621849(SURR) 25uL ID#621850(Spike) *FV before clean-up pH Paper ID:83520(6.0-8.0)
ADDITIONAL NOTES	WQCBLK 630222 and LCS 630223 are shared with pages 150 and 151 of this book.
EMULSION	C= Centrifuged, W= Wired, T= Tilted
REFERENCE BOOK & PAGE	17-0402-025 P120
TAP(S) USED	01-0402-015 Extraction 01-0402-125 Clean up

System ID	Type	Customer ID	PH	SAMPLE VOL	SURROGATE SOL VOL
1		B3HJN4	6.4	1050 mL	10 uL
2		B3HJN9	6.4	1050 mL	10 uL
3	**	B3HK67	6.0	1040 mL	10 uL
4	**	B3HK68	6.4	1050 mL	10 uL
5		B3HK61	6.4	1050 mL	10 uL
6	MS	B3HJN4	6.4	1050 mL	10 uL
7	MSD	B3HJN4	6.4	1060 mL	10 uL
8		WQCBLK_05APR18	6.4	1000 mL	10 uL
9		LCS_05APR18	6.4	1000 mL	10 uL

System ID	Type	Customer ID	MTX SPK SOL VOL	FV HEX	CLEAN UP STD VOL
1		B3HJN4	0 uL	~4mL*	25 uL
2		B3HJN9	0 uL	~4mL*	25 uL
3	**	B3HK67	0 uL	~4mL*	25 uL
4	**	B3HK68	0 uL	~4mL*	25 uL
5		B3HK61	0 uL	~4mL*	25 uL
6	MS	B3HJN4	10 uL	~4mL*	25 uL
7	MSD	B3HJN4	10 uL	~4mL*	25 uL
8		WQCBLK_05APR18	0 uL	~4mL*	25 uL
9		LCS_05APR18	10 uL	~4mL*	25 uL

System ID	Type	Customer ID	H2SO4 VOL (ML)	AL/SI 4.5"/4.5"	CHARCOAL YES/NO	EMULSION
1		B3HJN4	4	1	no	no
2		B3HJN9	4	1	no	no
3	**	B3HK67	4	1	no	no
4	**	B3HK68	4	1	no	no
5		B3HK61	4	1	no	no
6	MS	B3HJN4	4	1	no	no
7	MSD	B3HJN4	4	1	no	no
8		WQCBLK_05APR18	4	1	no	no
9		LCS_05APR18	4	1	no	no



(E8290W) Dioxin Water Extraction By Sep-Funnel 3510C (CH2M)

SwRI Labs

Client: CH2M Hill Plateau Remediation Company

Project: 20859.01.00X

Case: W18-003

Sample Receipt: 61374

TO#: 180320-7

Extraction Flowchart:

XmL H2O → ~4mL Hexane → Dioxin Clean-up (AC/Si/AL)

↳ FV Dryness for analysis

Page created Apr 5 2018 10:57AM by mlebron
Book: EXTRACTION LAB, Volume: EXT-2018, Page: 152 (Section 2 of 2)
Approved by Hamed Edrisi on Apr 12 2018 8:06AM

Date Printed: 4/12/2018



Shared QC (8290A) RS spiking

SwRI Labs

Client:

Project:

Case:

Sample Receipt:

TO#:

SOLVENT (CI#):	Nonane (CI# 67026)
RS SPIKE ID:	515-01-01-17
EXTRACT LOCATION:	Frz 31, Box 4, A8-A9

COMMENTS:	Associated w/ samples on pages 591, 592, and 593
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	System ID	Type	Customer ID	VOLUME RS	VOLUME SOLVENT	SPIKE DATE	SPIKE PERSON
1	630222		WQCBLK_05APR18	10.0 uL	30.0 uL	04/06/18	CG
2	630223		LCS_05APR18	10.0 uL	30.0 uL	04/06/18	CG

Page created Apr 6 2018 12:43PM by cgourley
 Book: BNA/DIOXIN, Volume: HRMS SPIKE LOG, Page: 590 (Section 1 of 1)
 Approved by Tom Farias on Apr 10 2018 3:18PM

Date Printed: 4/12/2018

CH2M Hill PRC (8290A) RS spiking

SwRI Labs

Client: CH2M Hill Plateau Remediation Company

Project: 20859.01.00X

Case: W18-003

Sample Receipt: 61374

TO#: 180320-7

SOLVENT (CI#):	Nonane (CI# 67026)	COMMENTS:	BLK and LCS spiked on page 590.
RS SPIKE ID:	515-01-01-17		
EXTRACT LOCATION:	Frz 31, Box 4, A11-B5		

	System ID	Type	Customer ID	VOLUME RS	VOLUME SOLVENT	SPIKE DATE	SPIKE PERSON
1	629427		B3HJN4	10.0 uL	30.0 uL	04/06/18	CG
2	629428		B3HJN9	10.0 uL	30.0 uL	04/06/18	CG
3	629429		B3HK67	10.0 uL	30.0 uL	04/06/18	CG
4	629430		B3HK68	10.0 uL	30.0 uL	04/06/18	CG
5	629441		B3HK61	10.0 uL	30.0 uL	04/06/18	CG
6	629427	MS	B3HJN4	10.0 uL	30.0 uL	04/06/18	CG
7	629427	MSD	B3HJN4	10.0 uL	30.0 uL	04/06/18	CG

Page created Apr 6 2018 12:51PM by c Gourley
 Book: BNA/DIOXIN, Volume: HRMS SPIKE LOG, Page: 593 (Section 1 of 1)
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