



Ft. Collins, Colorado

LIMS Version: 6.901

Page 1 of 1

Friday, August 02, 2019

Karen Waters-Husted
CH2M HILL Plateau Remediation Company
825 Jadwin Avenue
Richland, WA 99352

Re: ALS Workorder: 1907429
Project Name: SURV, JUNE 2019
Project Number: S19-006

Dear Ms. Waters-Husted:

Two water samples were received from CH2M HILL Plateau Remediation Company, on 6/14/2019. The samples were scheduled for the following analyses:

Gross Alpha/BetaGross Beta

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. O'Brien
Project Manager

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

RECHECK, RECOUNT, OR REANALYSIS ORDER

07/18/2019

Order Number: 190718ALS-R9971

ALS Environmental Ft. Collins
 225 Commerce Drive
 Fort Collins, CO 80524

Sample Delivery Group: ALS1906303

Method Name: 900.0_ALPHABETA_GPC

Sample#: B3PCX5 Sample Date: 6/12/2019 11:05:00 AM SAF #: S19-006

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
1906303-2	7/18/2019 3:10:04 PM	Gross beta	REANALYZE	15 Days / 15 Days
Special Instructions: Results are out of trend, please reanalyze. SLF 07/18/2019				

Method Name: 9310_ALPHABETA_GPC

Sample#: B3PPB5 Sample Date: 6/12/2019 11:55:00 AM SAF #: S19-006

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
1906303-1	7/18/2019 3:10:04 PM	Gross beta	REANALYZE	15 Days / 15 Days
Special Instructions: Results are out of trend, please reanalyze. SLF 07/18/2019				

Deliver Report Results to: CHPRC
 P.O. Box 1600
 Richland, WA 99352
 C/O Mr.Scot Fitzgerald

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1907429

Client Name: CH2M HILL Plateau Remediation Company

Client Project Name: SURV, JUNE 2019

Client Project Number: S19-006

Client PO Number: BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3PPB5	1907429-1		WATER	12-Jun-19	11:55
B3PCX5	1907429-2		WATER	12-Jun-19	11:05

~~61 Lbs~~
607429
1906303
6/12/19

CH2M Hill Plateau Remediation Company		C.O.C.# S19-006-209	
Collector: The Calhoun /CHTRC		Page 1 of 1	
Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650	Purchase Order/Charge Code: 300071	
Sampling Origin: Hanford Site	Logbook No.: HNF-N-506 - 105	Ice Chest No.: GWS-594	
Method of Shipment Commercial Carrier	Priority: 30 Days	Bill of Lading/Air Bill No.: 7775464231520	
Offsite Property No.: 11184	SPECIAL INSTRUCTIONS N/A		
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			
Sample No. Filter	Date	Time	No/Type Container
B3PPB5	1 JUN 17 2019	1155	1x1-L P
Sample Analysis	Holding Time	Preservative	
9310_ALPHA BETA_GPC: COMMON	6 Months	HNO3 to pH <2	

Relinquished By: The Calhoun /CHTRC	Received By: SSU-1	Signature	Date/Time
<i>G. Calby</i>	<i>Jefferson</i>		JUN 12 2019 0700
Relinquished By: SSU-1	Received By: FEDEX	Signature	Date/Time
<i>Jefferson</i>	<i>Jefferson</i>		JUN 13 2019 1400
Relinquished By: FEDEX	Received By: <i>Quincy</i>	Signature	Date/Time
<i>Quincy</i>	<i>Quincy</i>		JUN 14 2019 0955
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, used in process):	Date/Time:	
Printed On 5/14/2019	Disposed By:	A-6004-842 (REV 3)	

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C.# S19-006-163 Page 1 of 1
CH2Mhill Plateau Remediation Company		Telephone No.: 509-376-4650
Collector: Tim Callaway /CHPRC	Contact/Requester: Karen Waters-Husted	Purchase Order/Charge Code: 300071
SAF No.: S19-006	Sampling Origin: Hanford Site	Ice Chest No.: GWS-594
Project Title: SURV, JUNE 2019	Logbook No.: HNF-N-506 -105	Bill of Lading/Air Bill No.: 775464231520
Shipped To (Lab): ALS Environmental Ft. Collins	Method of Shipment Commercial Carrier	Offsite Property No.: 11184
Protocol: SURV	Priority: 30 Days	
<p>POSSIBLE SAMPLE HAZARDS/REMARK</p> <p>** ** 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</p>		Holding Time 6 Months HNO3 to pH <2
<p>SPECIAL INSTRUCTIONS</p> <p>N/A</p>		
Sample No. Filter * Date Time No/Type Container	Sample Analysis	Preservative
B3PCX5 2 N W JUN 12 2019 1105 1x1-L P	9310_ALPHA BETA_GPC: Gross Beta	

Relinquished By: Tim Callaway /CHPRC	Received By: SSU-1	JUN 12 2019	JUN 12 2019
Print First and Last Name	Print First and Last Name	Signature	Date/Time
Relinquished By: SSU-1	Received By: Jeff Lewis /CHPRC	JUN 13 2019 0700	JUN 13 2019 0700
Print First and Last Name	Print First and Last Name	Signature	Date/Time
Relinquished By: Jeff Lewis /CHPRC	Received By: FEDEX	JUN 13 2019 1400	JUN 13 2019 1400
Print First and Last Name	Print First and Last Name	Signature	Date/Time
Relinquished By: FEDEX	Received By: RENNAL BYONS	JUN 14 2019 0955	JUN 14 2019 0955
Print First and Last Name	Print First and Last Name	Signature	Date/Time
Relinquished By: RENNAL BYONS	Received By: Emberly	JUN 14 2019 0955	JUN 14 2019 0955
Print First and Last Name	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:

B25

1225

~~1906503~~ ~~1907422~~ 1907429
Aug 2/2/19
Page 1 of 1

ORIGIN DPECA (500) 528-6428
LESLEY WALL
6287 LATH ST.
RICHLAND, WA 98354
UNITED STATES US

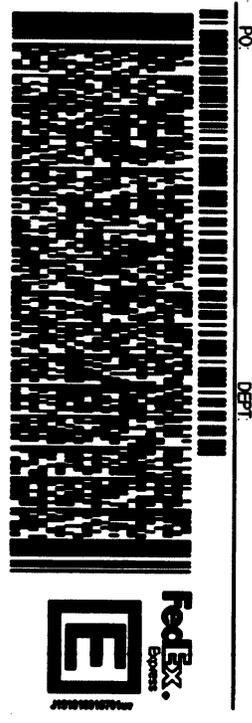
SHIP DATE: 13 JUN 19
ACTWGST: 61.00 LB
CAD: 1070665VNET4100
BILL THIRD PARTY

TO JULIE ELLINGSON
ALS GLOBAL
225 COMMERCE DRIVE

FORT COLLINS CO 80524
(970) 400-1511
REF: PTRR1184COOLERGMS-59

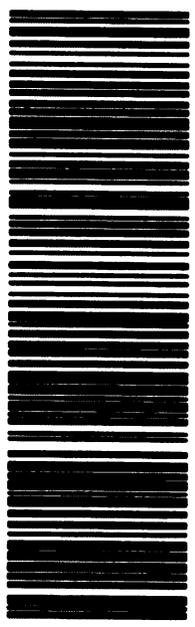
7.2
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565J11D210Z3AD



TRK# 7754 6423 1520
0207
FRI - 14 JUN 10:30A
PRIORITY OVERNIGHT
DSR
80524
DEN

XH FTCA
CO-US DEN



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Gross Alpha/Beta Case Narrative

CH2M HILL Plateau Remediation Company

SURV, JUNE 2019 – S19-006

Work Order Number: 1907429

1. The samples were prepared according to the current revision of SOP 702.
2. The samples were analyzed for gross alpha and/or beta activity by gas flow proportional counting according to the current revision of SOP 724. The analyses were completed on 08/01/2019. Gross alpha results are referenced to ^{241}Am . Gross beta results are referenced to $^{90}\text{Sr/Y}$.
3. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
4. The duplicate of sample 1907400-2 and matrix spikes of sample 1907233-1 are shared for this work order. The duplicate and matrix spikes were performed on CH2M HILL Plateau Remediation Company samples and the results are acceptable. The results can be found in the following report.
5. In accordance with project specific instructions, the evaluation threshold for Relative Percent Difference (RPD) has been set at 20%. RPD is defined as:

$$\text{RPD} = \frac{|S - D|}{(S + D)/2} * 100$$

Where: S = sample activity result and D = duplicate activity result. RPD is not evaluated for sample/duplicate pairs where the reported activity is less than 5 times the sample specific MDC, as indicated with an "NC" on the Duplicate Sample Results (RPD) page.

6. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Pik Yee Yuen
Pik Yee Yuen
Radiochemistry Primary Data Reviewer

8/2/19
Date

Kath M. W.
Radiochemistry Final Data Reviewer

8/2/19
Date

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Method Blank Results**Lab Name:** ALS -- Fort Collins**Work Order Number:** 1907429**Client Name:** CH2M HILL Plateau Remediation Company**ClientProject ID:** SURV, JUNE 2019 S19-006**Lab ID:** AB190723-1MB**Sample Matrix:** WATER**Prep Batch:** AB190723-1**Final Aliquot:** 200 ml**Prep SOP:** PAI 702 Rev 22**QCBatchID:** AB190723-1-1**Result Units:** pCi/l**Date Collected:** 23-Jul-19**Run ID:** AB190723-1A**File Name:** ABC0801A**Date Prepared:** 23-Jul-19**Count Time:** 1000 minutes**Date Analyzed:** 01-Aug-19

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	1.89E-01 +/- 4.93E-01	8.29E-01	3.00E+00	NA	U
12587-47-2	GROSS BETA	-2.67E-01 +/- 6.47E-01	1.08E+00	4.00E+00	NA	U

Comments:**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Lab ID: AB190723-1LCS	Sample Matrix: WATER	Prep Batch: AB190723-1	Final Aliquot: 200 ml
	Prep SOP: PAI 702 Rev 22	QCBatchID: AB190723-1-1	Result Units: pCi/l
	Date Collected: 23-Jul-19	Run ID: AB190723-1A	File Name: ABC0730B
	Date Prepared: 23-Jul-19	Count Time: 180 minutes	
	Date Analyzed: 30-Jul-19		

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	2.76E+02 +/- 4.50E+01	2.81E+00	2.330E+02	119	72 - 130	
12587-47-2	GROSS BETA	2.45E+02 +/- 3.96E+01	5.07E+00	2.320E+02	106	86 - 115	

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS Recovery within control limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Matrix Spike Results

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907233-1MS

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 22
Date Collected: 09-Jul-19
Date Prepared: 23-Jul-19
Date Analyzed: 30-Jul-19

Prep Batch: AB190723-1
QCBatchID: AB190723-1-1
Run ID: AB190723-1A
Count Time: 300 minutes
Report Basis: Unfiltered

Final Aliquot: 200 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC0730

Analysis ReqCode: 9310_ALPHABET

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	2.57E+02	4.48E-01	2.42E+00	2.330E+02	110	72 - 130	
12587-47-2	GROSS BETA	2.28E+02	6.09E-01	3.58E+00	2.320E+02	97.8	86 - 115	

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- N - Matrix Spike Recovery outside control limits
- P - Matrix Spike Recovery within control limits
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Sample specific Minimum Detectable Concentration

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Matrix Spike Results

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907233-1MSD

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 22
Date Collected: 09-Jul-19
Date Prepared: 23-Jul-19
Date Analyzed: 30-Jul-19

Prep Batch: AB190723-1
QC Batch ID: AB190723-1-1
Run ID: AB190723-1A
Count Time: 300 minutes
Report Basis: Unfiltered

Final Aliquot: 200 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC0730

Analysis ReqCode: 9310_ALPHABET

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
12587-46-1	GROSS ALPHA	2.81E+02	4.48E-01	2.31E+00	2.330E+02	121	72 - 130	
12587-47-2	GROSS BETA	2.30E+02	6.09E-01	3.69E+00	2.320E+02	98.7	86 - 115	

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- N - Matrix Spike Recovery outside control limits
- P - Matrix Spike Recovery within control limits
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Sample specific Minimum Detectable Concentration

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results**Lab Name:** ALS -- Fort Collins**Work Order Number:** 1907429**Client Name:** CH2M HILL Plateau Remediation Company**ClientProject ID:** SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907233-1

Sample Matrix: WATER**Prep Batch:** AB190723-1**Final Aliquot:** 200 ml**Prep SOP:** PAI 702 Rev 22**QC Batch ID:** AB190723-1-1**Prep Basis:** Unfiltered**Date Collected:** 09-Jul-19**Run ID:** AB190723-1A**Moisture(%):** NA**Date Prepared:** 23-Jul-19**Count Time:** 300 minutes**Result Units:** pCi/l**Date Analyzed:** 30-Jul-19**Report Basis:** Unfiltered**File Name:** ABC0730

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	4.48E-01 +/- 1.09E+00	2.28E+00	3E+00	NA	U
12587-47-2	GROSS BETA	6.09E-01 +/- 1.00E+00	2.03E+00	4E+00	NA	U

Comments:**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 1907429

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907233-1MSD

Sample Matrix: WATER

Prep SOP: PAI 702 Rev 22

Date Collected: 09-Jul-19

Date Prepared: 23-Jul-19

Date Analyzed: 30-Jul-19

Prep Batch: AB190723-1

QCBatchID: AB190723-1-1

Run ID: AB190723-1A

Count Time: 300 minutes

Report Basis: Unfiltered

Final Aliquot: 200 ml

Prep Basis: Unfiltered

Moisture(%): NA

Result Units: pCi/l

File Name: ABC0730

CASNO	Analyte	Sample				Duplicate				DER	DER Lim
		Result +/-	2 s TPU	MDC	Flags	Result +/-	2 s TPU	MDC	Flags		
12587-46-1	GROSS ALPHA	2.57E+02 +/-	4.18E+01	2.42E+00		2.81E+02 +/-	4.57E+01	2.31E+00		0.791	3
12587-47-2	GROSS BETA	2.28E+02 +/-	3.66E+01	3.58E+00		2.30E+02 +/-	3.69E+01	3.69E+00		0.0807	3

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

D - DER is greater than Control Limit of 3

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Duplicate Sample Results (RPD)

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907233-1MSD

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 22
Date Collected: 09-Jul-19
Date Prepared: 23-Jul-19
Date Analyzed: 30-Jul-19

Prep Batch: AB190723-1
QCBatchID: AB190723-1-1
Run ID: AB190723-1A
Count Time: 300 minutes
Report Basis: Unfiltered

Final Aliquot: 200 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC0730

CASNO	Analyte	Sample				Duplicate				RPD	RPD Lim
		Result +/-	2 s TPU	MDC	Flags	Result +/-	2 s TPU	MDC	Flags		
12587-46-1	GROSS ALPHA	2.57E+02 +/-	4.18E+01	2.42E+00		2.81E+02 +/-	4.57E+01	2.31E+00		9.00	20
12587-47-2	GROSS BETA	2.28E+02 +/-	3.66E+01	3.58E+00		2.30E+02 +/-	3.69E+01	3.69E+00		1.00	20

Comments:

Qualifiers/Flags:

- + - Duplicate RPD not within limits.
- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC

Abbreviations:

- TPU - Total Propagated Uncertainty
- BDL - Below Detection Limit
- NR - Not Reported

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907400-2DUP

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 22
Date Collected: 18-Jul-19
Date Prepared: 23-Jul-19
Date Analyzed: 30-Jul-19

Prep Batch: AB190723-1
QCBatchID: AB190723-1-1
Run ID: AB190723-1A
Count Time: 300 minutes
Report Basis: Unfiltered

Final Aliquot: 200 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC0730

CASNO	Analyte	Sample				Duplicate				DER	DER Lim
		Result +/-	2 s TPU	MDC	Flags	Result +/-	2 s TPU	MDC	Flags		
12587-46-1	GROSS ALPHA	3.61E+00 +/- 1.54E+00		2.24E+00		4.33E+00 +/- 1.69E+00		2.35E+00		0.633	3
12587-47-2	GROSS BETA	5.20E+00 +/- 1.43E+00		2.03E+00		5.13E+00 +/- 1.46E+00		2.15E+00		0.0641	3

Comments:

Duplicate Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- D - DER is greater than Control Limit of 3
- LT - Result is less than Request MDC, greater than sample specific MDC
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits

Abbreviations:

- TPU - Total Propagated Uncertainty
- DER - Duplicate Error Ratio
- BDL - Below Detection Limit
- NR - Not Reported

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Duplicate Sample Results (RPD)

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907400-2DUP

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 22
Date Collected: 18-Jul-19
Date Prepared: 23-Jul-19
Date Analyzed: 30-Jul-19

Prep Batch: AB190723-1
QCBatchID: AB190723-1-1
Run ID: AB190723-1A
Count Time: 300 minutes
Report Basis: Unfiltered

Final Aliquot: 200 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC0730

CASNO	Analyte	Sample				Duplicate				RPD	RPD Lim
		Result +/-	2 s TPU	MDC	Flags	Result +/-	2 s TPU	MDC	Flags		
12587-46-1	GROSS ALPHA	3.61E+00 +/- 1.54E+00		2.24E+00		4.33E+00 +/- 1.69E+00		2.35E+00		NC	20
12587-47-2	GROSS BETA	5.20E+00 +/- 1.43E+00		2.03E+00		5.13E+00 +/- 1.46E+00		2.15E+00		NC	20

Comments:

Qualifiers/Flags:

- + - Duplicate RPD not within limits.
- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC

Abbreviations:

- TPU - Total Propagated Uncertainty
- BDL - Below Detection Limit
- NR - Not Reported

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907400-2

Sample Matrix: WATER	Prep Batch: AB190723-1	Final Aliquot: 200 ml
Prep SOP: PAI 702 Rev 22	QCBatchID: AB190723-1-1	Prep Basis: Unfiltered
Date Collected: 18-Jul-19	Run ID: AB190723-1A	Moisture(%): NA
Date Prepared: 23-Jul-19	Count Time: 300 minutes	Result Units: pCi/l
Date Analyzed: 30-Jul-19	Report Basis: Unfiltered	File Name: ABC0730

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	3.61E+00 +/- 1.54E+00	2.24E+00	3E+00	NA	
12587-47-2	GROSS BETA	5.20E+00 +/- 1.43E+00	2.03E+00	4E+00	NA	

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M - The requested MDC was not met.

Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Sample specific Minimum Detectable Concentration
- BDL - Below Detection Limit
- DL - Decision Level

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Duplicate Results

Lab Name: ALS -- Fort Collins
Work Order Number: 1907429
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: SURV, JUNE 2019 S19-006

Field ID:	Shared QC
Lab ID:	1907400-2DUP

Sample Matrix: WATER
Prep SOP: PAI 702 Rev 22
Date Collected: 18-Jul-19
Date Prepared: 23-Jul-19
Date Analyzed: 30-Jul-19

Prep Batch: AB190723-1
QCBatchID: AB190723-1-1
Run ID: AB190723-1A
Count Time: 300 minutes
Report Basis: Unfiltered

Final Aliquot: 200 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: ABC0730

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	4.33E+00 +/- 1.69E+00	2.35E+00	3E+00	NA	
12587-47-2	GROSS BETA	5.13E+00 +/- 1.46E+00	2.15E+00	4E+00	NA	

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

- D - DER is greater than Control Limit of 3

Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Sample specific Minimum Detectable Concentration
- BDL - Below Detection Limit
- DL - Decision Level

Data Package ID: AB1907429-1

Date Printed:

Friday, August 02, 2019

ALS -- Fort Collins

LIMS Version: 6.901

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Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results**Lab Name:** ALS -- Fort Collins**Work Order Number:** 1907429**Client Name:** CH2M HILL Plateau Remediation Company**ClientProject ID:** SURV, JUNE 2019 S19-006

Field ID:	B3PPB5
Lab ID:	1907429-1

Sample Matrix: WATER**Prep SOP:** PAI 702 Rev 22**Date Collected:** 12-Jun-19**Date Prepared:** 23-Jul-19**Date Analyzed:** 01-Aug-19**Prep Batch:** AB190723-1**QC Batch ID:** AB190723-1-1**Run ID:** AB190723-1A**Count Time:** 1000 minutes**Report Basis:** Unfiltered**Final Aliquot:** 100 ml**Prep Basis:** Unfiltered**Moisture(%):** NA**Result Units:** pCi/l**File Name:** ABC0801A**Analysis ReqCode:** 9310_ALPHABET

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-46-1	GROSS ALPHA	4.25E+00 +/- 1.75E+00	2.42E+00	3E+00	NA	
12587-47-2	GROSS BETA	1.96E+01 +/- 3.54E+00	2.27E+00	4E+00	NA	

Comments:**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: AB1907429-1

Gross Alpha/Beta by GFPC

PAI 724 Rev 13

Sample Results**Lab Name:** ALS -- Fort Collins**Work Order Number:** 1907429**Client Name:** CH2M HILL Plateau Remediation Company**ClientProject ID:** SURV, JUNE 2019 S19-006

Field ID:	B3PCX5
Lab ID:	1907429-2

Sample Matrix: WATER**Prep Batch:** AB190723-1**Final Aliquot:** 160 ml**Prep SOP:** PAI 702 Rev 22**QCBatchID:** AB190723-1-5**Prep Basis:** Unfiltered**Date Collected:** 12-Jun-19**Run ID:** AB190723-1A**Moisture(%):** NA**Date Prepared:** 23-Jul-19**Count Time:** 400 minutes**Result Units:** pCi/l**Date Analyzed:** 30-Jul-19**Report Basis:** Unfiltered**File Name:** ABC0730A**Analysis ReqCode:** 9310_ALPHABET

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
12587-47-2	GROSS BETA	5.02E+02 +/- 8.03E+01	2.28E+00	4E+00	NA	

Comments:**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: AB1907429-1

Prep Batch ID: AB190723-1

Start Date: 07/23/19

End Date: 07/23/19

Concentration Method: NONE

Batch Created By: mig

Start Time: 9:13

End Time: 9:13

Extract Method: PAI 70222

Date Created: 07/23/19

Prep Analyst: Mikenna I. Gapinski

Initial Volume Units: ml

Time Created: 9:13

Comments:

Final Volume Units: ml

Validated By: MIG

Samples 1907301-1 and 1907301-1 DUP were filtered and preserved prior to prep

Date Validated: 07/29/19

Time Validated: 13:43

QC Batch ID: AB190723-1-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
AB190723-1	MB	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907233
AB190723-1	LCS	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907233
1907233-1	MS	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907233
1907233-1	MSD	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907233
1907400-2	DUP	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907400
1907233-1	SMP	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907233
1907400-2	SMP	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907400
1907429-1	SMP	B3PPB5	WATER	6/12/2019	100	100	NONE	1	1907429

QC Types

CAR	Carrier reference sample	DLS	Detection Limit Standard
DUP	Laboratory Duplicate	LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicat	LODV	Limit of Detection Verification
LOQV	Limit of Quantitation Verification	MB	Method Blank
MS	Laboratory Matrix Spike	MSD	Laboratory Matrix Spike Duplicate
REP	Sample replicate	RVS	Reporting Level Verification Standar
SMP	Field Sample	SYS	Sample Yield Spike

Prep Batch ID: AB190723-1

Start Date: 07/23/19	End Date: 07/23/19	Concentration Method: NONE	Batch Created By: mig
Start Time: 9:13	End Time: 9:13	Extract Method: PAI 70222	Date Created: 07/23/19
Prep Analyst: Mikenna I. Gapinski		Initial Volume Units: ml	Time Created: 9:13
		Final Volume Units: ml	Validated By: MIG
Comments:			Date Validated: 07/29/19
Samples 1907301-1 and 1907301-1 DUP were filtered and preserved prior to prep			Time Validated: 13:43

QC Batch ID: AB190723-1-5

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
AB190723-1	MB	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907429
AB190723-1	LCS	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907429
1907233-1	MS	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907429
1907233-1	MSD	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907429
1907400-2	DUP	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907429
1907233-1	SMP	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907429
1907400-2	SMP	XXXXXX	WATER	XXXXXX	200	200	NONE	1	1907429
1907429-2	SMP	B3PCX5	WATER	6/12/2019	160	160	NONE	1	1907429

QC Types

CAR	Carrier reference sample		DLS	Detection Limit Standard	
DUP	Laboratory Duplicate		LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicat		LODV	Limit of Detection Verification	
LOQV	Limit of Quantitation Verification		MB	Method Blank	
MS	Laboratory Matrix Spike		MSD	Laboratory Matrix Spike Duplicate	
REP	Sample replicate		RVS	Reporting Level Verification Standar	
SMP	Field Sample		SYS	Sample Yield Spike	