

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Denver

4955 Yarrow Street

Arvada, CO 80002

Tel: (303)736-0100

TestAmerica Job ID: 280-98402-1

TestAmerica Sample Delivery Group: DN0158

Client Project/Site: W17-006

For:

CH2M Hill Plateau Remediation Company

PO BOX 1600, MS H8-41

Richland, Washington 99352

Attn: Mr. Scot Fitzgerald



Authorized for release by:

7/3/2017 5:45:17 PM

Darlene Bandy, Project Manager I

(303)736-0100

darlene.bandy@testamericainc.com



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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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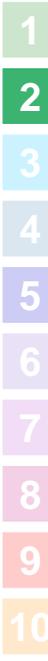


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Case Narrative

Client: CH2M Hill Plateau Remediation Company
 Project/Site: W17-006

TestAmerica Job ID: 280-98402-1
 SDG: DN0158

Job ID: 280-98402-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: CH2M Hill Plateau Remediation Company

Job Number: 280-98402-1

SDG #: DN0158
SAF#(s): W17-006

Date SDG Closed: June 16, 2017
Data Deliverable: 30 Day / Summary

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

LCS/LCSD = Laboratory Control Sample/Laboratory Control Sample Duplicate
 MS/MSD = Matrix Spike/Matrix Spike Duplicate

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 6/16/2017 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

ALKALINITY

Samples B39XP8 (280-98402-1), B39XN7 (280-98402-2) and B39XN9 (280-98402-3) were analyzed for Alkalinity in accordance with SM20 2320B. The samples were analyzed on 06/27/2017.

Alkalinity as CaCO₃ was detected in method blank MB 280-379126/5 at a level that was above the method detection limit (MDL) but below the reporting limit (RL). The value should be considered an estimate, and has been flagged "B". Because the concentration in the method blank was not present at a level greater than the RL, corrective action is deemed unnecessary. If the associated samples reported a result above the MDL and/or RL and the method blank concentration was greater than 5% of the sample concentration, the result has been flagged "C".

No additional analytical or quality issues were noted.

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 signature on this report.

Reviewed and approved:

Darlene Bandy
 Project Manager

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 280-98402-1

SDG Number: DN0158

Login Number: 98402**List Number: 1****Creator: Pottruff, Reed W****List Source: TestAmerica Denver**

| Question | Answer | Comment |
|--|--------|---------|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | 60 CPM |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | 1.1°C |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

13 LBS

| | | | | | |
|--|--------|---|---------|---|-------------------|
| CH2MHill Plateau Remediation Company | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | C.O.C. # W17-006-184 | |
| Juan Aguilar /CHPRC | | Contact/Requester Karen Waters-Husted | | Telephone No. 509-376-4650 | |
| W17-006 | | Sampling Origin Hanford Site | | Purchase Order/Charge Code 300071 | |
| RCRA, JUNE 2017 | | Logbook No. HNF-N-506 92 / 93 | | Ice Chest No. 605-442 | |
| Shipped To (Lab) Test/America Denver | | Method of Shipment Commercial Carrier | | Bill of Lading/Air Bill No. 7794 1575 3569 | |
| Protocol RCRA | | Priority: 30 Days | | Offsite Property No. 8049 | |
| POSSIBLE SAMPLE HAZARDS/REMARKS | | SPECIAL INSTRUCTIONS | | Total Activity Exemption: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| ** ** 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 | | N/A | | | |
| Sample No. | Filter | * | Date | Time | No/Type Container |
| B39XP8 | N | W | 6-15-17 | 1300 | 1x250-mL G/P |
| 2320_ALKALINITY: COMMON | | Sample Analysis | | Holding Time | |
| | | | | 14 Days | |
| | | | | Preservative | |
| | | | | Cool <=6C | |



1.1 IR# 70.0 Transfer RP 6-16-17

| | | | | | | | |
|--|----------------------|---------------------|-------------------|--------------------------------------|----------------------|---------------------|--------------------------|
| Relinquished By Juan Aguilar /CHPRC | Print [Signature] | Sign JUN 15 2017 | Date/Time 1332 | Received By Lesly Wall /CHPRC | Print [Signature] | Sign JUN 15 2017 | Date/Time 1332 |
| Relinquished By Lesly Wall /CHPRC | Print [Signature] | Sign JUN 15 2017 | Date/Time 1400 | Received By FEDEX | Print FEDEX | Sign [Signature] | Date/Time [Signature] |
| Relinquished By FedEx | Print [Signature] | Sign 6-16-17 | Date/Time 0945 | Received By Reed Pottruff Feedlot | Print [Signature] | Sign 6-16-17 | Date/Time 0945 |
| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time |

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

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

FINAL SAMPLE DISPOSITION

PRINTED ON 5/15/2017

FSR ID = FSR45136

A-6004-842 (REV 2)



CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#
W17-006-173
Page 1 of 1

CH2MHill Plateau Remediation
Company

| | | | | | | |
|------------------|------------------------|--------|--------------------|---------------------|-----------------------------|----------------|
| Collector | Juan Aguilar JCHPRC | DN0158 | Contact/Requester | Karen Waters-Husted | Telephone No. | 509-376-4650 |
| SAF No. | W17-006 | | Sampling Origin | Hanford Site | Purchase Order/Charge Code | 300071 |
| Project Title | RCRA, JUNE 2017 | | Logbook No. | HNF-N-50692-193 | Ice Chest No. | 6005-442 |
| Shipped To (Lab) | TestAmerica Denver | | Method of Shipment | Commercial Carrier | Bill of Lading/Air Bill No. | 7794 1575 3569 |
| Protocol | RCRA | | Priority: | 30 Days | Offsite Property No. | |

POSSIBLE SAMPLE HAZARDS/REMARKS
 ** ** 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: Hold Time: N/A
 Total Activity Exemption: Yes No

| Sample No. | Filter | * Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|------------|--------|-----------|------|-------------------|-------------------------|--------------|--------------|
| B39XN7 | N | W 6-15-17 | 1103 | 1x250-mL G/P | 2320_ALKALINITY: COMMON | 14 Days | Cool <=6C |

| | | | | | | | | | | |
|-----------------|------------------------|-------|------|-------------|--------------------------------|-------|------|-----------|-------------|------|
| Relinquished By | Juan Aguilar JCHPRC | Print | Sign | Received By | Lesly Wall JCHPRC | Print | Sign | Date/Time | JUN 15 2017 | 1145 |
| Relinquished By | Lesly Wall JCHPRC | Print | Sign | Received By | FEDEX | Print | Sign | Date/Time | JUN 15 2017 | 1400 |
| Relinquished By | FedEx | Print | Sign | Received By | Reed Petrucci Reed Petrucci | Print | Sign | Date/Time | 6-16-17 | 0945 |
| Relinquished By | | Print | Sign | Received By | | Print | Sign | Date/Time | | |

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

Matrix *

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



CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **W17-006-175**
Page 1 of 1

Collector: Juan Aguilar /CHPRC DMC158 Telephone No. 509-376-4650
 SAF No. W17-006 Contact/Requester: Karen Waters-Husted
 Project Title: RCRA, JUNE 2017 Sampling Origin: Hanford Site
 Shipped To (Lab): TestAmerica Denver Logbook No. HNF-N-506 92/93 Purchase Order/Charge Code: 300071
 Protocol: RCRA Method of Shipment: Commercial Carrier Ice Chest No. 6005-442
 Priority: 30 Days Bill of Lading/Air Bill No. 7794 1575 3569
 SPECIAL INSTRUCTIONS: N/A Hold Time: Offsite Property No. Total Activity Exemption: Yes No

POSSIBLE SAMPLE HAZARDS/REMARKS
 *** 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

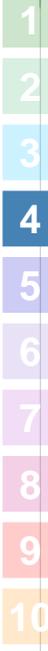
| Sample No. | Filter | * Date | Time | No/Type Container | Sample Analysis | Holding Time | Preservative |
|------------|--------|-----------|------|-------------------|-------------------------|--------------|--------------|
| B39XN9 | N | W 6-15-17 | 0845 | 1x250-mL G/P | 2320_ALKALINITY: COMMON | 14 Days | Cool <=6C |

| Relinquished By | Print | Sign | Date/Time | Received By | Print | Sign | Date/Time | Matrix # |
|---------------------|-------|------|------------------|----------------------|-------|------|------------------|---|
| Juan Aguilar /CHPRC | | | JUN 15 2017 1645 | Leah Wall /CHPRC | | | JUN 15 2017 1045 | DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other |
| Leah Wall /CHPRC | | | JUN 15 2017 1400 | FEDEX | | | | S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air |
| FedEx | | | | Reed Poltruff /CHPRC | | | 6-16-17 0945 | |
| | | | | | | | | |

Disposal Method (e.g., Return to customer, per lab procedure, used in process):

Disposed By: _____ Date/Time: _____

PRINTED ON 5/23/2017 FSR ID = FSR25971 A-6001-842 (REV 2)



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779415753569

Ship date:

Thu 6/15/2017

Actual delivery:

Fri 6/16/2017 8:46 am

Richland, WA US

Delivered

ARVADA, CO US

Signed for by: R.POTTRUFF

Travel History

| Date/Time | Activity | Location |
|------------------------|------------------------------------|-------------|
| - 6/16/2017 - Friday | | |
| 9:46 am | Delivered | ARVADA, CO |
| 9:23 am | On FedEx vehicle for delivery | ARVADA, CO |
| 8:43 am | At local FedEx facility | ARVADA, CO |
| 6:20 am | At destination sort facility | DENVER, CO |
| 5:15 am | Departed FedEx location | MEMPHIS, TN |
| 12:28 am | Arrived at FedEx location | MEMPHIS, TN |
| - 6/15/2017 - Thursday | | |
| 4:47 pm | Left FedEx origin facility | PASCO, WA |
| 4:35 pm | Shipment information sent to FedEx | |
| 4:20 pm | Picked up | PASCO, WA |

Shipment Facts

| | | | |
|--------------------------|---|--------------------|---------------------------|
| Tracking number | 779415753569 | Service | FedEx Priority Overnight |
| Weight | 13 lbs / 5.9 kgs | Signature services | Direct signature required |
| Delivered To | Shipping/Receiving | Total pieces | 1 |
| Total shipment weight | 13 lbs / 5.9 kgs | Terms | Third Party |
| Shipper reference | PTR#8049 | Packaging | Your Packaging |
| Special handling section | Deliver Weekday, Additional Handling Surcharge, Direct Signature Required | Standard transit | 6/16/2017 by 10:30 am |



Search or tracking number Subr

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Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98402-1
SDG: DN0158

Qualifiers

General Chemistry

| Qualifier | Qualifier Description |
|-----------|--|
| U | Analyzed for but not detected. |
| B | Estimated result. Result is less than the RL, but greater than MDL |

Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|----------------|---|
| α | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98402-1
SDG: DN0158

| Method | Method Description | Protocol | Laboratory |
|----------|--------------------|----------|------------|
| SM 2320B | Alkalinity | SM | TAL DEN |

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100



Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98402-1
SDG: DN0158

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|------------------|--------|----------------|----------------|
| 280-98402-1 | B39XP8 | Water | 06/15/17 13:00 | 06/16/17 09:45 |
| 280-98402-2 | B39XN7 | Water | 06/15/17 11:03 | 06/16/17 09:45 |
| 280-98402-3 | B39XN9 | Water | 06/15/17 08:45 | 06/16/17 09:45 |

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Client Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: W17-006

TestAmerica Job ID: 280-98402-1
 SDG: DN0158

General Chemistry

Client Sample ID: B39XP8
Date Collected: 06/15/17 13:00
Date Received: 06/16/17 09:45

Lab Sample ID: 280-98402-1
Matrix: Water

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------------------|--------|-----------|------|------|------|---|----------|----------------|---------|
| Alkalinity as CaCO3 | 84000 | | 5000 | 1070 | ug/L | | | 06/27/17 10:12 | 1 |

Client Sample ID: B39XN7
Date Collected: 06/15/17 11:03
Date Received: 06/16/17 09:45

Lab Sample ID: 280-98402-2
Matrix: Water

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------------------|--------|-----------|------|------|------|---|----------|----------------|---------|
| Alkalinity as CaCO3 | 99200 | | 5000 | 1070 | ug/L | | | 06/27/17 10:22 | 1 |

Client Sample ID: B39XN9
Date Collected: 06/15/17 08:45
Date Received: 06/16/17 09:45

Lab Sample ID: 280-98402-3
Matrix: Water

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------------------|--------|-----------|------|------|------|---|----------|----------------|---------|
| Alkalinity as CaCO3 | 1070 | U | 5000 | 1070 | ug/L | | | 06/27/17 10:27 | 1 |

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
 Project/Site: W17-006

TestAmerica Job ID: 280-98402-1
 SDG: DN0158

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 280-379126/5
 Matrix: Water
 Analysis Batch: 379126

Client Sample ID: Method Blank
 Prep Type: Total/NA

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---------------------|-----------|--------------|------|------|------|---|----------|----------------|---------|
| Alkalinity as CaCO3 | 3170 | B | 5000 | 1070 | ug/L | | | 06/27/17 10:06 | 1 |

Lab Sample ID: LCS 280-379126/4
 Matrix: Water
 Analysis Batch: 379126

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---------------------|-------------|------------|---------------|------|---|------|--------------|
| Alkalinity as CaCO3 | 200000 | 210200 | | ug/L | | 105 | 80 - 120 |

Lab Sample ID: 280-98402-1 DU
 Matrix: Water
 Analysis Batch: 379126

Client Sample ID: B39XP8
 Prep Type: Total/NA

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---------------------|---------------|------------------|-----------|--------------|------|---|-----|-----------|
| Alkalinity as CaCO3 | 84000 | | 86580 | | ug/L | | 3 | 20 |

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QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: W17-006

TestAmerica Job ID: 280-98402-1
SDG: DN0158

General Chemistry

Analysis Batch: 379126

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|------------------|--------------------|-----------|--------|----------|------------|
| 280-98402-1 | B39XP8 | Total/NA | Water | SM 2320B | |
| 280-98402-2 | B39XN7 | Total/NA | Water | SM 2320B | |
| 280-98402-3 | B39XN9 | Total/NA | Water | SM 2320B | |
| MB 280-379126/5 | Method Blank | Total/NA | Water | SM 2320B | |
| LCS 280-379126/4 | Lab Control Sample | Total/NA | Water | SM 2320B | |
| 280-98402-1 DU | B39XP8 | Total/NA | Water | SM 2320B | |