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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Richland
2800 George Washington Way
Richland, WA 99352
Tel: (509)375-3131

TestAmerica Job ID: 300-725-1
TestAmerica Sample Delivery Group: WC0320
Client Project/Site: CH2M Hill Chemical

For:
CH2M Hill Plateau Remediation Company
PO BOX 1600
Mail Stop R3-50
Richland, Washington 99352

Attn: CPP Sample Management

*Authorized for release by:*
*9/16/2015 1:29:38 PM*

Whitney Ritari, Project Manager I
(509)375-3131 ext164
whitney.ritari@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this package. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a desingee as verified by the attached signature.*

*The laboratory is accredited to EPA 7196A in Solid and Chemical Materials, per Washington State Department of Ecology this is approved for non-discharge water samples. The sample/ sample duplicate RPD agreement is not applicable if one or both results are elss than five times the MDL.*

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# Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320



## Qualifiers

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Analyzed for but not detected. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | 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, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| 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 |
| 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) |

# Case Narrative

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320

## Job ID: 300-725-1

### Laboratory: TestAmerica Richland

**Narrative**

**Job Narrative**
**300-725-1**

**Comments**
No additional comments.

**Receipt**
The sample was received on 9/10/2015 2:30 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 9.7º C.

**General Chemistry**
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# SAMPLE ISSUE RESOLUTION

| | |
|---|---|
| **SIR NUM** | SIR15-474 |
| **REV NUM** | 0 |
| **DATE INITIATED** | 9/16/2015 |

## SAMPLE EVENT INFORMATION

| | |
|---|---|
| **SAF NUM(S)** | F15-028 |
| **OPERABLE UNIT(S)** | 100-KR-2 |
| **PROJECT(S)** | 100-KE FSB |
| **SAMPLE EVENT TITLE(S)** | Characterization Boreholes in UPR-100-K-1 and 1116-KE-3 Waste Sites |
| **LABORATORY** | TestAmerica Incorporated, Richland |

## SAMPLING INFORMATION

| | |
|---|---|
| **NUMBER OF SAMPLES** | 1 |
| **SAMPLE NUMBERS** | B31TY7 |
| **SAMPLE MATRIX** | WATER |
| **COLLECTION DATE** | 9/10/2015 - 9/10/2015 |
| **SDG NUM** | WC0320 |

## ISSUE BACKGROUND

| | |
|---|---|
| **CLASS** | Chain of Custody Issue (Field) |
| **TYPE** | No Unit Type Noted For Sample Depths |
| **DESCRIPTION** | COC F15-028-058, SAMPLE B31TY7.<br>NO UNIT TYPE FOR SAMPLE DEPTH |

## DISPOSITION

| | |
|---|---|
| **DESCRIPTION** | DOCUMENT AND CLOSE |
| **JUSTIFICATION** | DOCUMENT AND CLOSE |
| | SUBMITTED BY: Gayelyn Gibson DATE: 09/14/2015<br>ACCEPTED BY: Kirsten Killand DATE: 09/16/2015 |

# SAMPLE ISSUE RESOLUTION

| | |
|---|---|
| **SIR NUM** | SIR16-136 |
| **REV NUM** | 0 |
| **DATE INITIATED** | 12/15/2015 |

## SAMPLE EVENT INFORMATION

| | |
|---|---|
| **SAF NUM(S)** | F15-028 |
| **OPERABLE UNIT(S)** | 100-KR-2 |
| **PROJECT(S)** | 100-KE FSB |
| **SAMPLE EVENT TITLE(S)** | Characterization Boreholes in UPR-100-K-1 and 1116-KE-3 Waste Sites |
| **LABORATORY** | TestAmerica Incorporated, Richland |

## SAMPLING INFORMATION

| | |
|---|---|
| **NUMBER OF SAMPLES** | 1 |
| **SAMPLE NUMBERS** | B31TY7 |
| **SAMPLE MATRIX** | WATER |
| **COLLECTION DATE** | 9/10/2015 - 9/10/2015 |
| **SDG NUM** | WC0320 |

## ISSUE BACKGROUND

| | |
|---|---|
| **CLASS** | Chain of Custody Issue (Field) |
| **TYPE** | No/Illegible Relinquisher/Receiver Listed on COC |
| **DESCRIPTION** | COC F15-028-058, SAMPLE B31TY7.<br>Missing Received By signature. |

## DISPOSITION

| | |
|---|---|
| **DESCRIPTION** | DOCUMENT AND CLOSE |
| **JUSTIFICATION** | DOCUMENT AND CLOSE |

SUBMITTED BY: Jessa Szecsody DATE: 11/25/2015
ACCEPTED BY: Kirsten Killand DATE: 12/15/2015

REV 1

December 17, 2015

| CH2MHill Plateau Remediation Company | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | F15-028-058 | PAGE 1 OF 1 |
|---|---|---|---|

| COLLECTOR | COMPANY CONTACT | TELEPHONE NO. | PROJECT COORDINATOR | PRICE CODE 7H | DATA TURNAROUND |
|---|---|---|---|---|---|
| L.D. Wall/CHPRC | TODAK, D | 376-6427 | TODAK, D | AIR QUALITY ☐ | 30 Days / 30 Days |
| **SAMPLING LOCATION** | **PROJECT DESIGNATION** | | **SAF NO.** | | |
| C8797, Interval W-6 | 100-KE Characterization Boreholes - Water | | F15-028 | | |
| **ICE CHEST NO.** | **FIELD LOGBOOK NO.** | **ACTUAL SAMPLE DEPTH** | **COA** | **METHOD OF SHIPMENT** | |
| N/A | HNF-N-645 3 - 25 | 117.05 | 303581 | GOVERNMENT VEHICLE | **ORIGINAL** |
| **SHIPPED TO** | **OFFSITE PROPERTY NO.** | | **BILL OF LADING/AIR BILL NO.** | | |
| TestAmerica Incorporated, Richland | N/A | | N/A | | |

9/16/2015

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

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

**SPECIAL HANDLING AND/OR STORAGE**
~~RADIOACTIVE TIE TO: B32116~~
JLH 9/2/15

| | |
|---|---|
| PRESERVATION | Cool <=6C |
| HOLDING TIME | 24 Hours |
| TYPE OF CONTAINER | aG |
| NO. OF CONTAINER(S) | 1 |
| VOLUME | 60mL |
| SAMPLE ANALYSIS | 7196_CR6: COMMON; |

#725
W C0320

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | |
|---|---|---|---|---|
| B31TY7 | WATER | SEP 10 2015 | 0755 | ✓ |

300-725 COC

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| CHAIN OF POSSESSION | | SIGN/ PRINT NAMES | | SPECIAL INSTRUCTIONS |
|---|---|---|---|---|
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME | TRVL-15-112 |
| L.D. Wall/CHPRC | SEP 10 2015 0900 | CHRIS FULTON CHPRC | SEP 10 2015 0900 | |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME | |
| CHRIS FULTON CHPRC | SEP 10 2015 1430 | J. Bock, TAR | SEP 10 2015 1430 | |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME | |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME | |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME | |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME | |
| RELINQUISHED BY/REMOVED FROM | DATE/TIME | RECEIVED BY/STORED IN | DATE/TIME | |

| LABORATORY SECTION | RECEIVED BY | TITLE | DATE/TIME |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | DISPOSAL METHOD | DISPOSED BY | DATE/TIME |

PRINTED ON 8/19/2015 **FSR ID = FSR4786** **TRVL NUM = TRVL-15-112** A-6003-618 (REV 2)

# Detection Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320

**Client Sample ID: B31TY7** **Lab Sample ID: 300-725-1**

No Detections.



This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320

**Client Sample ID: B31TY7**
**Date Collected: 09/10/15 07:55**
**Date Received: 09/10/15 14:30**

**Lab Sample ID: 300-725-1**
**Matrix: Water**

## General Chemistry

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | 0.0015 | U | 0.0040 | 0.0015 | mg/L | | | 09/10/15 18:04 | 1 |

# QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320

## Method: 7196A - Chromium, Hexavalent

**Lab Sample ID: MB 300-1029/3**
**Matrix: Water**
**Analysis Batch: 1029**

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

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | 0.0015 | U | 0.0040 | 0.0015 | mg/L | | | 09/10/15 18:00 | 1 |

**Lab Sample ID: LCS 300-1029/4**
**Matrix: Water**
**Analysis Batch: 1029**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Cr (VI) | 0.250 | 0.257 | | mg/L | | 103 | 85 - 115 |

**Lab Sample ID: 300-725-1 MS**
**Matrix: Water**
**Analysis Batch: 1029**

**Client Sample ID: B31TY7**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Cr (VI) | 0.0015 | U | 0.0499 | 0.0505 | | mg/L | | 101 | 85 - 115 |

**Lab Sample ID: 300-725-1 DU**
**Matrix: Water**
**Analysis Batch: 1029**

**Client Sample ID: B31TY7**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Cr (VI) | 0.0015 | U | 0.0015 | U | mg/L | | NC | 20 |

# QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320



## General Chemistry

### Analysis Batch: 1029

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 300-725-1 | B31TY7 | Total/NA | Water | 7196A | |
| 300-725-1 DU | B31TY7 | Total/NA | Water | 7196A | |
| 300-725-1 MS | B31TY7 | Total/NA | Water | 7196A | |
| LCS 300-1029/4 | Lab Control Sample | Total/NA | Water | 7196A | |
| MB 300-1029/3 | Method Blank | Total/NA | Water | 7196A | |

# Lab Chronicle

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320

## Client Sample ID: B31TY7 — Lab Sample ID: 300-725-1

**Date Collected: 09/10/15 07:55** — **Matrix: Water**
**Date Received: 09/10/15 14:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 7196A | | 1 | | | 1029 | 09/10/15 18:04 | AMC | TAL RCH |

## Client Sample ID: B31TY7 — Lab Sample ID: 300-725-1 DU

**Date Collected: 09/10/15 07:55** — **Matrix: Water**
**Date Received: 09/10/15 14:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 7196A | | 1 | | | 1029 | 09/10/15 18:04 | AMC | TAL RCH |

## Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 300-1029/4

**Date Collected: N/A** — **Matrix: Water**
**Date Received: N/A**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 7196A | | 1 | | | 1029 | 09/10/15 18:01 | AMC | TAL RCH |

## Client Sample ID: Method Blank — Lab Sample ID: MB 300-1029/3

**Date Collected: N/A** — **Matrix: Water**
**Date Received: N/A**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 7196A | | 1 | | | 1029 | 09/10/15 18:00 | AMC | TAL RCH |

## Client Sample ID: B31TY7 — Lab Sample ID: 300-725-1 MS

**Date Collected: 09/10/15 07:55** — **Matrix: Water**
**Date Received: 09/10/15 14:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 7196A | | 1 | | 3.0 mL | 1029 | 09/10/15 18:01 | AMC | TAL RCH |

**Laboratory References:**

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131

# Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 7196A | Chromium, Hexavalent | SW846 | TAL RCH |

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131

# Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: CH2M Hill Chemical

TestAmerica Job ID: 300-725-1
SDG: WC0320

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 300-725-1 | B31TY7 | Water | 09/10/15 07:55 | 09/10/15 14:30 |

# Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 300-725-1
SDG Number: WC0320

**Login Number: 725**
**List Number: 1**
**Creator: Bock, Julie A**

**List Source: TestAmerica Richland**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| 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 | |
| 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. | 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. | N/A | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |