

# 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: 300-657-1  
TestAmerica Sample Delivery Group: WC0296  
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:  
8/31/2015 2:17:38 PM

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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13



### LINKS

Review your project results through  
**TotalAccess**

Have a Question?

 **Ask The Expert**

Visit us at:  
[www.testamericainc.com](http://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 desinee 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.*



# Table of Contents

|                                  |    |
|----------------------------------|----|
| Cover Page . . . . .             | 1  |
| Table of Contents . . . . .      | 2  |
| Definitions/Glossary . . . . .   | 3  |
| Case Narrative . . . . .         | 4  |
| Detection Summary . . . . .      | 5  |
| Client Sample Results . . . . .  | 6  |
| QC Sample Results . . . . .      | 7  |
| QC Association Summary . . . . . | 8  |
| Lab Chronicle . . . . .          | 9  |
| Method Summary . . . . .         | 10 |
| Sample Summary . . . . .         | 11 |
| Chain of Custody . . . . .       | 12 |
| Receipt Checklists . . . . .     | 13 |

**Definitions/Glossary**

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

TestAmerica Job ID: 300-657-1  
 SDG: WC0296



**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: 300-657-1  
SDG: WC0296

**Job ID: 300-657-1**

**Laboratory: TestAmerica Richland**

**Narrative**

**Job Narrative  
300-657-1**

**Comments**

No additional comments.

**Receipt**

The sample was received on 8/28/2015 11:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 9.2° C.

**General Chemistry**

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



**SAMPLE ISSUE RESOLUTION**

|                       |           |
|-----------------------|-----------|
| <b>SIR NUM</b>        | SIR15-450 |
| <b>REV NUM</b>        | 0         |
| <b>DATE INITIATED</b> | 8/31/2015 |

**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** B31TW9

**SAMPLE MATRIX** WATER

**COLLECTION DATE** 8/28/2015 - 8/28/2015

**SDG NUM** WC0296

**ISSUE BACKGROUND**

**CLASS** Chain of Custody Issue (Field)

**TYPE** No Unit Type Noted For Sample Depths

**DESCRIPTION** COC #F15-028-040, SAMPLE B31TW9.  
NO SAMPLE DEPTH UNIT

**DISPOSITION**

**DESCRIPTION** DOCUMENT AND CLOSE

**JUSTIFICATION** DOCUMENT AND CLOSE

SUBMITTED BY: GAYELYN GIBSON DATE: 08/31/2015  
ACCEPTED BY: Kirsten Killand DATE: 08/31/2015

**SAMPLE ISSUE RESOLUTION**

|                       |           |
|-----------------------|-----------|
| <b>SIR NUM</b>        | SIR16-191 |
| <b>REV NUM</b>        | 0         |
| <b>DATE INITIATED</b> | 1/20/2016 |

**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** B31TW9

**SAMPLE MATRIX** WATER

**COLLECTION DATE** 8/28/2015 - 8/28/2015

**SDG NUM** WC0296

**ISSUE BACKGROUND**

**CLASS** Chain of Custody Issue (Field)

**TYPE** No/Illegible Relinquisher/Receiver Listed on COC

**DESCRIPTION** COC F15-028-040, SAMPLE B31TW9.  
Missing first received by signature.

**DISPOSITION**

**DESCRIPTION** DOCUMENT AND CLOSE

**JUSTIFICATION** DOCUMENT AND CLOSE

SUBMITTED BY: Jessa Szecsody DATE: 12/11/2015  
ACCEPTED BY: Kirsten Killand DATE: 01/20/2016

### Detection Summary

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

TestAmerica Job ID: 300-657-1  
SDG: WC0296

**Client Sample ID: B31TW9**

**Lab Sample ID: 300-657-1**

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

This Detection Summary does not include radiochemical test results.

TestAmerica Richland

### Client Sample Results

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

TestAmerica Job ID: 300-657-1  
SDG: WC0296

**Client Sample ID: B31TW9**

**Lab Sample ID: 300-657-1**

**Date Collected: 08/28/15 07:31**

**Matrix: Water**

**Date Received: 08/28/15 11:00**

#### General Chemistry

| Analyte | Result | Qualifier | RL     | MDL    | Unit | D | Prepared | Analyzed       | Dil Fac |
|---------|--------|-----------|--------|--------|------|---|----------|----------------|---------|
| Cr (VI) | 0.0015 | U         | 0.0040 | 0.0015 | mg/L |   |          | 08/28/15 13:36 | 1       |



QC Sample Results

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

TestAmerica Job ID: 300-657-1  
 SDG: WC0296

Method: 7196A - Chromium, Hexavalent

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Lab Sample ID: MB 300-913/3  
 Matrix: Water  
 Analysis Batch: 913

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 |   |          | 08/28/15 13:32 | 1       |

Lab Sample ID: LCS 300-913/4  
 Matrix: Water  
 Analysis Batch: 913

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: 300-657-1 MS  
 Matrix: Water  
 Analysis Batch: 913

Client Sample ID: B31TW9  
 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                | 0.0501      | 0.0511    |              | mg/L |   | 102  | 85 - 115     |

Lab Sample ID: 300-657-1 DU  
 Matrix: Water  
 Analysis Batch: 913

Client Sample ID: B31TW9  
 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: 300-657-1  
SDG: WC0296



### General Chemistry

#### Analysis Batch: 913

| Lab Sample ID | Client Sample ID   | Prep Type | Matrix | Method | Prep Batch |
|---------------|--------------------|-----------|--------|--------|------------|
| 300-657-1     | B31TW9             | Total/NA  | Water  | 7196A  |            |
| 300-657-1 DU  | B31TW9             | Total/NA  | Water  | 7196A  |            |
| 300-657-1 MS  | B31TW9             | Total/NA  | Water  | 7196A  |            |
| LCS 300-913/4 | Lab Control Sample | Total/NA  | Water  | 7196A  |            |
| MB 300-913/3  | Method Blank       | Total/NA  | Water  | 7196A  |            |

Lab Chronicle

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

TestAmerica Job ID: 300-657-1  
 SDG: WC0296

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

**Client Sample ID: B31TW9** **Lab Sample ID: 300-657-1**  
**Date Collected: 08/28/15 07:31** **Matrix: Water**  
**Date Received: 08/28/15 11:00**

| 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          |                |              | 913          | 08/28/15 13:36       | AMC     | TAL RCH |

**Client Sample ID: B31TW9** **Lab Sample ID: 300-657-1 DU**  
**Date Collected: 08/28/15 07:31** **Matrix: Water**  
**Date Received: 08/28/15 11:00**

| 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          |                |              | 913          | 08/28/15 13:36       | AMC     | TAL RCH |

**Client Sample ID: Lab Control Sample** **Lab Sample ID: LCS 300-913/4**  
**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          |                |              | 913          | 08/28/15 13:33       | AMC     | TAL RCH |

**Client Sample ID: Method Blank** **Lab Sample ID: MB 300-913/3**  
**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          |                |              | 913          | 08/28/15 13:32       | AMC     | TAL RCH |

**Client Sample ID: B31TW9** **Lab Sample ID: 300-657-1 MS**  
**Date Collected: 08/28/15 07:31** **Matrix: Water**  
**Date Received: 08/28/15 11:00**

| 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       | 913          | 08/28/15 13:33       | 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: 300-657-1  
SDG: WC0296



| 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: 300-657-1  
SDG: WC0296

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

---

| Lab Sample ID | Client Sample ID | Matrix | Collected      | Received       |
|---------------|------------------|--------|----------------|----------------|
| 300-657-1     | B31TW9           | Water  | 08/28/15 07:31 | 08/28/15 11:00 |



|  |  |  |                                 |   |   |
|--|--|--|---------------------------------|---|---|
| CH2M-Hill Plateau Remediation Company            |  | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST |                                 | FL5-028-040                             | PAGE 1 OF 1   |
| COLLECTOR<br>EL Kauer/CHPRC                      | COMPANY CONTACT<br>TODAK, D                                      | TELEPHONE NO.<br>376-6427                | PROJECT COORDINATOR<br>TODAK, D | PRICE CODE<br>7H                        | DATA<br>TURNAROUND<br>30 Days / 30 Days                     |
| SAMPLING LOCATION<br>C8797, Interval W-2         | PROJECT DESIGNATION<br>100-KE Characterization Boreholes - Water | FIELD LOGBOOK NO.<br>H05N-645 3 pg 20    | SAF NO.<br>FL5-028              | AIR QUALITY<br><input type="checkbox"/> | METHOD OF SHIPMENT<br>GOVERNMENT VEHICLE<br><b>ORIGINAL</b> |
| ICE CHEST NO.<br>N/A                             | OFFSITE PROPERTY NO.<br>N/A                                      | ACTUAL SAMPLE DEPTH<br>8.2.9             | COA<br>303581                   | BILL OF LADING/AIR BILL NO.<br>N/A      |   |
| SHIPPED TO<br>TestAmerica Incorporated, Richland |  |  |                                 |   |   |

|   |  |                           |                          |                         |                          |                |                                       |
|---|--|---------------------------|--------------------------|-------------------------|--------------------------|----------------|---------------------------------------|
| MATRIX*<br>A=Air<br>DL=Drum<br>L=Liquid<br>DS=Drum<br>S=Soil<br>O=Oil<br>SE=Sediment<br>T=Tissue<br>V=Vegetation<br>W=Water<br>WI=Wipe<br>X=Other | POSSIBLE SAMPLE HAZARDS/ REMARKS<br>*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. | PRESERVATION<br>Cool <=6C | HOLDING TIME<br>24 Hours | TYPE OF CONTAINER<br>ag | NO. OF CONTAINER(S)<br>1 | VOLUME<br>60mL | SAMPLE ANALYSIS<br>7156, GR6; COMMON; |
| SAMPLE NO.<br>B31TW9  | MATRIX*<br>WATER   | SAMPLE DATE<br>8-28-15    | SAMPLE TIME<br>0731      |                         |                          |                |                                       |
| SPECIAL HANDLING AND/OR STORAGE<br>RADIOACTIVE ILL-10-83212<br>Jlt 9/27/15  |  |                           |                          |                         |                          |                |                                       |



300-657 COC

# 657  
SDG# 6000296

|  |                               |  |                               |                      |  |
|--|-------------------------------|--|-------------------------------|----------------------|--|
| CHAIN OF POSSESSION                              |                               | SIGN/ PRINT NAMES                        |                               | SPECIAL INSTRUCTIONS |  |
| RELINQUISHED BY/REMOVED FROM<br>E.L. Kauer/CHPRC | DATE/TIME<br>AUG 28 2015 0840 | RECEIVED BY/STORED IN<br>CHRIS FULTON    | DATE/TIME<br>AUG 28 2015 1106 | TRVL-15-112          |  |
| RELINQUISHED BY/REMOVED FROM<br>CHRIS FULTON     | DATE/TIME<br>AUG 28 2015 1100 | RECEIVED BY/STORED IN<br>J. Friesz, TARB | DATE/TIME<br>AUG 28 2015 1106 | 6840                 |  |
| 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 |       | DATE/TIME |

PRINTED ON 8/19/2015 FSR ID = FSR1222 TRVL NUM = TRVL-15-112 A-6003-618 (REV 2)

**Login Sample Receipt Checklist**



Client: CH2M Hill Plateau Remediation Company

Job Number: 300-657-1  
SDG Number: WC0296

**Login Number: 657**  
**List Number: 1**  
**Creator: Friesz, Jordan D**

**List Source: TestAmerica Richland**

| Question  | Answer | Comment |
|---|--------|---------|
| Radioactivity wasn't checked or is <math>\leq</math> 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 <math><6\text{mm}</math> (1/4"). | N/A    |         |
| Multiphasic samples are not present.  | N/A    |         |
| Samples do not require splitting or compositing.  | N/A    |         |
| Residual Chlorine Checked.  | N/A    |         |