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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

Erie Coke - 9034

Lot #: H6I270413

William Cowell

Montrose Air Quality Services
1050 William Pitt Way
Pittsburgh, PA 15238

TESTAMERICA LABORATORIES, INC.

Courtney M. Adkins
Project Manager

October 7, 2016

# PROJECT NARRATIVE
## H6I270413

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

### Sample Receipt

There were no problems with the condition of the samples received.

### Subcontract

The following analyses were performed by the TestAmerica Pittsburgh Laboratory (NELAP Accrediting Authority: PADEP; Lab ID 02-00416), 301 Alpha Drive, Pittsburgh, PA 15238, (412)963-7058, Debbie Lowe, Laboratory Director: Sulfide (SW846 9034)

### Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

# Sample Receipt Documentation

# Request for Analysis/Chain-of-Custody – RFA/COC #004
## Montrose Air Quality Services LLC
## Coke ICR Testing on Dust and Water Samples

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H6I270413

| Project Identification: | Montrose Air Quality Services Coke ICR |
|---|---|
| Client Contact: | Mr. Matthew Dallesasse (Montrose) (412) 826-3636 |
| TestAmerica Contact: | Ms. Courtney Adkins (865) 291-3019 |
| TestAmerica Project Manager: | Mr. Kevin Woodcock (865) 291-3082 |

**Analytical Testing QC Requirements:**
The Legend for Project-Specific Quality Control Testing is designated in the "QC" column as follows: "MS" = Matrix Spike, "MSD" = Matrix Spike Duplicate, "DUP" = Duplicate, "PDS" = Post Digestion Spike and "PDSD" = Post Digestion Spike Duplicate

| Laboratory Deliverable Turnaround Requirements: | |
|---|---|
| Analytical Due Date: (Review-Released Data) | 21 Days from Lab Receipt |
| Data Package Due Date: | 28 Days from Lab Receipt |
| **Media Request Form No.:** | 083016-8 |
| **Laboratory Destination:** | TestAmerica Knoxville 5815 Middlebrook Pike Knoxville, Tennessee 37921 (865) 291-3000 |
| **Courier:** | TestAmerica Courier Service |

**Project Deliverables:**
Report analytical results on Quantims R-02 and TALS Reports and in data packages. Include "Field Sample Number", "Sample Type", and "Run Number" on all Reports.

| Analytical Parameter: | Holding Time Requirements: | Preservation Requirements: |
|---|---|---|
| Sulfides | 7 Days to Analysis | Zinc Acetate, NaOH to pH > 9, Cool, 4°C |

| Field Sample No./Sample Coding ID | Loc. No. | Sample Collection Date | Project QC Require-ments | Sample Bottle/ Container | Sample Type | Analytical Specifications |
|---|---|---|---|---|---|---|
| R-1606 Loc #3 Water QT-R1A | 3 | 9/22/16 | MS/MSD | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #3** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1614 Loc #4 Water QT-R1B | 4 | 9/22/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #4** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1622 Loc #5 Water QT-R1C | 5 | 9/22/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #5** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1630 Loc #6 Water QT-R2A | 6 | 9/23/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #6** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1638 Loc #7 Water QT-R2B | 7 | 9/23/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #7** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |

# Request for Analysis/Chain-of-Custody – RFA/COC #004
## Montrose Air Quality Services LLC
## Coke ICR Testing on Dust and Water Samples

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| Field Sample No./Sample Coding ID | Loc. No. | Sample Collection Date | Project QC Require-ments | Sample Bottle/ Container | Sample Type | Analytical Specifications |
|---|---|---|---|---|---|---|
| R-1646 Loc #8 Water QT-R2C | 8 | 9/23/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #8** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1654 Loc #9 Water QT-R3A | 9 | 9/26/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #9** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1662 Loc #10 Water QT-R3B | 10 | 9/26/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #10** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1670 Loc #11 Water QT-R3C | 11 | 9/26/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #11** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |

**Request for Analysis/Chain-of-Custody – RFA/COC #004**
**Montrose Air Quality Services LLC**
**Coke ICR Testing on Dust and Water Samples**

TestAmerica
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## Sample Receipt Log and Condition of the Samples Upon Receipt:

| Please fill in the following information: | Comments (Please write "NONE" if no comment applicable) |
|---|---|
| (1) Record the identities of any samples that were listed on the RFA but were not found in the sample shipment. | NONE |
| (2) Record the sample shipping cooler temperature of all coolers transporting samples listed on this RFA: | RT 3.7, 4.8, 3.3, 4.4 / CT 3.7, 4.8, 3.3, 4.4 |
| (3) Record any apparent sample loss/breakage. | NONE |
| (4) Record any unidentified samples transported with this shipment of samples: | NONE |
| (5) Indicate if all samples were received according to the project's required specifications (i.e. no nonconformances): | HAND DELIVERED, CUSTODY SEALS INTACT |

## Custody Transfer:

| | Name | Company | Date/Time |
|---|---|---|---|
| Relinquished By: | [illegible] | Montrose | 9/26/16 11:00 |
| Accepted By: | [illegible] | Test America | 9/26/16 11:00 |
| Relinquished By: | [illegible] | Test America | 9/26/16 21:57 |
| Accepted By: | [illegible] | TA Knx | 9/26/16 21:57 |
| Relinquished By: | | | |
| Accepted By: | | | |
| Relinquished By: | | | |
| Accepted By: | | | |

## TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Log In Number:** H6I270413

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Are the shipping containers intact? | ✓ | | | ☐ **Containers, Broken** |
| 2. Were ambient air containers received intact? | | | ✓ | ☐ Checked in lab |
| 3. The coolers/containers custody seal if present, is it intact? | ✓ | | | ☐ Yes<br>☐ NA |
| 4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : S661<br>Correction factor: 0.0 | ✓ | | | ☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel**<br>☐ **Cooler Out of Temp, Same Day Receipt** |
| 5. Were all of the sample containers received intact? | ✓ | | | ☐ **Containers, Broken** |
| 6. Were samples received in appropriate containers? | ✓ | | | ☐ **Containers, Improper; Client Contacted; Proceed/Cancel** |
| 7. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **COC & Samples Do Not Match**<br>☐ **COC Incorrect/Incomplete**<br>☐ **COC Not Received** |
| 8. Were all of the samples listed on the COC received? | ✓ | | | ☐ **Sample Received, Not on COC**<br>☐ **Sample on COC, Not Received** |
| 9. Is the date/time of sample collection noted? | ✓ | | | ☐ **COC; No Date/Time; Client Contacted** |
| 10. Was the sampler identified on the COC? | | | ✓ | ☐ **Sampler Not Listed on COC** |
| 11. Is the client and project name/# identified? | ✓ | | | ☐ **COC Incorrect/Incomplete** |
| 12. Are tests/parameters listed for each sample? | ✓ | | | ☐ **COC No tests on COC** |
| 13. Is the matrix of the samples noted? | ✓ | | | ☐ **COC Incorrect/Incomplete** |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **COC Incorrect/Incomplete** |
| 15. Were samples received within holding time? | ✓ | | | ☐ **Holding Time - Receipt** |
| 16. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **pH Adjusted, pH Included (See box 16A)**<br>☐ **Incorrect Preservative** |
| 17. Were VOA samples received without headspace? | | | ✓ | ☐ **Headspace (VOA only)** |
| 18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: | | | ✓ | ☐ **Residual Chlorine** |
| 19. For 1613B water samples is pH<9? | | | ✓ | ☐ If no, lab will adjust |
| 20. For rad samples was sample activity info. Provided? | | | ✓ | ☐ Project missing info |

**Comments/Actions Taken**

**Labeling Verified by:** **Date:**

**pH test strip lot number:**

| Box 16A: pH Preservation | Box 18A: Residual Chlorine |
|---|---|
| Preservative: | |
| Lot Number: | |
| Exp Date: | |
| Analyst: | |
| Date: | |
| Time: | |

Project #: 92425 PM Instructions: NA

Sample Receiving Associate: [signature] Date: ~~9-26-16~~ 9-27-16 bn 9/27-16

QA026R30.doc, 080916

# TestAmerica
# Pittsburgh

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

Job Number: 180-59091-1

Job Description: Knoxville, Montrose, Erie Coke

For:
TestAmerica Laboratories, Inc.
5815 Middlebrook Pike
Knoxville, TN 37921

Attention: Mr. Kevin S Woodcock

Approved for release.
David A Dunlap
Senior Project Manager
10/4/2016 12:47 PM

David A Dunlap, Senior Project Manager
301 Alpha Drive, Pittsburgh, PA, 15238
(412)963-2432
dave.dunlap@testamericainc.com
10/04/2016

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of TestAmerica and its client. All questions regarding this report should be directed to the TestAmerica Project Manager or designee who has signed this report.

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# Definitions/Glossary

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## Qualifiers

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## 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) |

**Job Narrative**
**180-59091-1**

**Receipt**
The samples were received on 9/28/2016 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1º C.

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

# Detection Summary

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## Client Sample ID: R-1606 LOC#3 WATER QT-R1A — Lab Sample ID: 180-59091-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 0.60 | J | 3.0 | 0.59 | mg/L | 1 | | 9034 | Total/NA |

## Client Sample ID: R-1614 LOC#4 WATER QT-R1B — Lab Sample ID: 180-59091-2

No Detections.

## Client Sample ID: R-1622 LOC#5 WATER QT-R1C — Lab Sample ID: 180-59091-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 0.91 | J | 3.0 | 0.59 | mg/L | 1 | | 9034 | Total/NA |

## Client Sample ID: R-1630 LOC#6 WATER QT-R2A — Lab Sample ID: 180-59091-4

No Detections.

## Client Sample ID: R-1638 LOC#7 WATER QT-R2B — Lab Sample ID: 180-59091-5

No Detections.

## Client Sample ID: R-1646 LOC#8 WATER QT-R2C — Lab Sample ID: 180-59091-6

No Detections.

## Client Sample ID: R-1654 LOC#9 WATER QT-R3A — Lab Sample ID: 180-59091-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 1.1 | J | 3.0 | 0.59 | mg/L | 1 | | 9034 | Total/NA |

## Client Sample ID: R-1662 LOC#10 WATER QT-R3B — Lab Sample ID: 180-59091-8

No Detections.

## Client Sample ID: R-1670 LOC#11 WATER QT-R3C — Lab Sample ID: 180-59091-9

No Detections.

This Detection Summary does not include radiochemical test results.

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1606 LOC#3 WATER QT-R1A**
**Date Collected: 09/22/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 0.60 | J | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:04 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1614 LOC#4 WATER QT-R1B**
**Date Collected: 09/22/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:07 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1622 LOC#5 WATER QT-R1C**
**Date Collected: 09/22/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-3**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 0.91 | J | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:09 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1630 LOC#6 WATER QT-R2A**
**Date Collected: 09/23/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-4**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:15 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1638 LOC#7 WATER QT-R2B**
**Date Collected: 09/23/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-5**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:18 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1646 LOC#8 WATER QT-R2C**
**Date Collected: 09/23/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-6**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:20 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1654 LOC#9 WATER QT-R3A**
**Date Collected: 09/26/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-7**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 1.1 | J | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:22 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1662 LOC#10 WATER QT-R3B**
**Date Collected: 09/26/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-8**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:24 | 1 |

# Client Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

**Client Sample ID: R-1670 LOC#11 WATER QT-R3C**
**Date Collected: 09/26/16 00:00**
**Date Received: 09/28/16 09:00**

**Lab Sample ID: 180-59091-9**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 16:26 | 1 |

# Default Detection Limits

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

### Prep: 9030B

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Sulfide | 3.0 | 0.59 | mg/L | 9034 |

# QC Sample Results

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric)

**Lab Sample ID: MB 180-189581/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 189622** — **Prep Batch: 189581**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 3.0 | 0.59 | mg/L | | 09/29/16 11:00 | 09/29/16 15:49 | 1 |

**Lab Sample ID: LCS 180-189581/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 189622** — **Prep Batch: 189581**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 19.2 | 16.4 | | mg/L | | 85 | 85 - 115 |

**Lab Sample ID: 180-59091-1 MS** — **Client Sample ID: R-1606 LOC#3 WATER QT-R1A**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 189622** — **Prep Batch: 189581**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 0.60 | J | 19.2 | 17.4 | | mg/L | | 87 | 75 - 125 |

**Lab Sample ID: 180-59091-1 MSD** — **Client Sample ID: R-1606 LOC#3 WATER QT-R1A**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 189622** — **Prep Batch: 189581**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfide | 0.60 | J | 19.2 | 17.8 | | mg/L | | 89 | 75 - 125 | 2 | 20 |

# QC Association Summary

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## General Chemistry

### Prep Batch: 189581

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-59091-1 | R-1606 LOC#3 WATER QT-R1A | Total/NA | Water | 9030B | |
| 180-59091-2 | R-1614 LOC#4 WATER QT-R1B | Total/NA | Water | 9030B | |
| 180-59091-3 | R-1622 LOC#5 WATER QT-R1C | Total/NA | Water | 9030B | |
| 180-59091-4 | R-1630 LOC#6 WATER QT-R2A | Total/NA | Water | 9030B | |
| 180-59091-5 | R-1638 LOC#7 WATER QT-R2B | Total/NA | Water | 9030B | |
| 180-59091-6 | R-1646 LOC#8 WATER QT-R2C | Total/NA | Water | 9030B | |
| 180-59091-7 | R-1654 LOC#9 WATER QT-R3A | Total/NA | Water | 9030B | |
| 180-59091-8 | R-1662 LOC#10 WATER QT-R3B | Total/NA | Water | 9030B | |
| 180-59091-9 | R-1670 LOC#11 WATER QT-R3C | Total/NA | Water | 9030B | |
| MB 180-189581/1-A | Method Blank | Total/NA | Water | 9030B | |
| LCS 180-189581/2-A | Lab Control Sample | Total/NA | Water | 9030B | |
| 180-59091-1 MS | R-1606 LOC#3 WATER QT-R1A | Total/NA | Water | 9030B | |
| 180-59091-1 MSD | R-1606 LOC#3 WATER QT-R1A | Total/NA | Water | 9030B | |

### Analysis Batch: 189622

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-59091-1 | R-1606 LOC#3 WATER QT-R1A | Total/NA | Water | 9034 | 189581 |
| 180-59091-2 | R-1614 LOC#4 WATER QT-R1B | Total/NA | Water | 9034 | 189581 |
| 180-59091-3 | R-1622 LOC#5 WATER QT-R1C | Total/NA | Water | 9034 | 189581 |
| 180-59091-4 | R-1630 LOC#6 WATER QT-R2A | Total/NA | Water | 9034 | 189581 |
| 180-59091-5 | R-1638 LOC#7 WATER QT-R2B | Total/NA | Water | 9034 | 189581 |
| 180-59091-6 | R-1646 LOC#8 WATER QT-R2C | Total/NA | Water | 9034 | 189581 |
| 180-59091-7 | R-1654 LOC#9 WATER QT-R3A | Total/NA | Water | 9034 | 189581 |
| 180-59091-8 | R-1662 LOC#10 WATER QT-R3B | Total/NA | Water | 9034 | 189581 |
| 180-59091-9 | R-1670 LOC#11 WATER QT-R3C | Total/NA | Water | 9034 | 189581 |
| MB 180-189581/1-A | Method Blank | Total/NA | Water | 9034 | 189581 |
| LCS 180-189581/2-A | Lab Control Sample | Total/NA | Water | 9034 | 189581 |
| 180-59091-1 MS | R-1606 LOC#3 WATER QT-R1A | Total/NA | Water | 9034 | 189581 |
| 180-59091-1 MSD | R-1606 LOC#3 WATER QT-R1A | Total/NA | Water | 9034 | 189581 |

# Lab Chronicle

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## Client Sample ID: R-1606 LOC#3 WATER QT-R1A — Lab Sample ID: 180-59091-1

**Date Collected: 09/22/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:04 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1614 LOC#4 WATER QT-R1B — Lab Sample ID: 180-59091-2

**Date Collected: 09/22/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:07 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1622 LOC#5 WATER QT-R1C — Lab Sample ID: 180-59091-3

**Date Collected: 09/22/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:09 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1630 LOC#6 WATER QT-R2A — Lab Sample ID: 180-59091-4

**Date Collected: 09/23/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:15 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1638 LOC#7 WATER QT-R2B — Lab Sample ID: 180-59091-5

**Date Collected: 09/23/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:18 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1646 LOC#8 WATER QT-R2C — Lab Sample ID: 180-59091-6

**Date Collected: 09/23/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:20 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1654 LOC#9 WATER QT-R3A — Lab Sample ID: 180-59091-7

**Date Collected: 09/26/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:22 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1662 LOC#10 WATER QT-R3B — Lab Sample ID: 180-59091-8

**Date Collected: 09/26/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:24 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

## Client Sample ID: R-1670 LOC#11 WATER QT-R3C — Lab Sample ID: 180-59091-9

**Date Collected: 09/26/16 00:00** — **Matrix: Water**
**Date Received: 09/28/16 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9030B | | | 50.0 mL | 50.0 mL | 189581 | 09/29/16 11:00 | SJM | TAL PIT |
| Total/NA | Analysis | 9034 | | 1 | | | 189622 | 09/29/16 16:26 | SJM | TAL PIT |
| | Instrument ID: NOEQUIP | | | | | | | | | |

**Laboratory References:**
TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

**Analyst References:**
Lab: TAL PIT
Batch Type: Prep
SJM = Samantha McDermott

Batch Type: Analysis
SJM = Samantha McDermott

# Certification Summary

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

## Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| Arkansas DEQ | State Program | 6 | 88-0690 | 06-27-17 |
| California | State Program | 9 | 2891 | 03-31-18 |
| Connecticut | State Program | 1 | PH-0688 | 09-30-18 |
| Florida | NELAP | 4 | E871008 | 06-30-17 |
| Illinois | NELAP | 5 | 200005 | 06-30-17 |
| Kansas | NELAP | 7 | E-10350 | 01-31-17 |
| Louisiana | NELAP | 6 | 04041 | 06-30-17 |
| New Hampshire | NELAP | 1 | 2030 | 04-04-17 |
| New Jersey | NELAP | 2 | PA005 | 06-30-17 |
| New York | NELAP | 2 | 11182 | 03-31-17 |
| North Carolina (WW/SW) | State Program | 4 | 434 | 12-31-16 |
| Pennsylvania | NELAP | 3 | 02-00416 | 04-30-17 |
| South Carolina | State Program | 4 | 89014 | 04-30-17 |
| Texas | NELAP | 6 | T104704528-15-2 | 03-31-17 |
| US Fish & Wildlife | Federal | | LE94312A-1 | 10-31-16 |
| USDA | Federal | | P330-16-00211 | 06-26-19 |
| Utah | NELAP | 8 | PA001462015-4 | 05-31-17 |
| Virginia | NELAP | 3 | 460189 | 09-14-17 |
| West Virginia DEP | State Program | 3 | 142 | 01-31-17 |
| Wisconsin | State Program | 5 | 998027800 | 08-31-17 |

# Method Summary

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9034 | Sulfide, Acid soluble and Insoluble (Titrimetric) | SW846 | TAL PIT |

**Protocol References:**

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

**Laboratory References:**

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

# Sample Summary

Client: TestAmerica Laboratories, Inc.
Project/Site: Knoxville, Montrose, Erie Coke

TestAmerica Job ID: 180-59091-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 180-59091-1 | R-1606 LOC#3 WATER QT-R1A | Water | 09/22/16 00:00 | 09/28/16 09:00 |
| 180-59091-2 | R-1614 LOC#4 WATER QT-R1B | Water | 09/22/16 00:00 | 09/28/16 09:00 |
| 180-59091-3 | R-1622 LOC#5 WATER QT-R1C | Water | 09/22/16 00:00 | 09/28/16 09:00 |
| 180-59091-4 | R-1630 LOC#6 WATER QT-R2A | Water | 09/23/16 00:00 | 09/28/16 09:00 |
| 180-59091-5 | R-1638 LOC#7 WATER QT-R2B | Water | 09/23/16 00:00 | 09/28/16 09:00 |
| 180-59091-6 | R-1646 LOC#8 WATER QT-R2C | Water | 09/23/16 00:00 | 09/28/16 09:00 |
| 180-59091-7 | R-1654 LOC#9 WATER QT-R3A | Water | 09/26/16 00:00 | 09/28/16 09:00 |
| 180-59091-8 | R-1662 LOC#10 WATER QT-R3B | Water | 09/26/16 00:00 | 09/28/16 09:00 |
| 180-59091-9 | R-1670 LOC#11 WATER QT-R3C | Water | 09/26/16 00:00 | 09/28/16 09:00 |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

| Reagent ID | Exp Date | Prep Date | Dilutant Used | Reagent Final Volume | Parent Reagent | | Analyte | Concentration |
|---|---|---|---|---|---|---|---|---|
| | | | | | Reagent ID | Volume Added | | |
| **WSULFPSP_00266** | 10/03/16 | 09/26/16 | DI Water, Lot Super Q | 250 mL | WSulfide_00002 | 1.8 g | Sulfide | 961.2 mg/L |
| .WSulfide_00002 | 05/21/18 | Sigma-Aldrich, Lot MKB51093V | | | (Purchased Reagent) | | Sulfide | 0.1335 g/g |
| **WSULFSICVCCV_00269** | 10/03/16 | 09/26/16 | DI Water, Lot Super Q | 250 mL | WSulfideprim_00001 | 1.8 g | Sulfide | 961.2 mg/L |
| .WSulfideprim_00001 | 01/11/17 | Fisher, Lot 143808 | | | (Purchased Reagent) | | Sulfide | 0.1335 g/g |

# Reagent

# WSulfide_00002

SIGMA-ALDRICH®

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

# Certificate of Analysis

Product Name:
Sodium sulfide nonahydrate - ACS reagent, ≥98.0%

| | |
|---|---|
| **Product Number:** | **208043** |
| **Batch Number:** | **MKBT1093V** |
| Brand: | SIAL |
| CAS Number: | 1313-84-4 |
| MDL Number: | MFCD00149184 |
| Formula: | Na2S · 9H2O |
| Formula Weight: | 240.18 g/mol |
| Storage Temperature: | Store at 2 - 8 °C |
| Quality Release Date: | 24 OCT 2014 |

$Na_2S \cdot 9H_2O$

1581789
ID: WSulfide_00002
Exp:05/21/18 Prpd:CMR Opn:05/21/15
sodium sulfide, nonahydra

| Test | Specification | Result |
|---|---|---|
| Appearance (Color)<br>Colorless to White to Slight Yellow | Conforms to Requirements | White |
| Appearance (Form)<br>Crystals or Chunks | Conforms to Requirements | Crystals |
| ICP Major Analysis<br>Confirms Sodium and Sulfur Components | Confirmed | Conforms |
| Titration by Na2S2O3 | ≥ 98.0 % | 99.5 % |
| Ammonia (NH4) | ≤ 0.005 % | 0.001 % |
| Assay<br>(Sulfite and Thiosulfate) | ≤ 0.1 % | < 0.1 % |
| Iron (Fe) | Pass | Pass |
| Meets ACS Requirements<br>Tenth Edition | Current ACS Specification | Conforms |

Ali Ataei, Manager
Quality Control
Milwaukee, WI US

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

# Reagent

---

# **WSulfideprim_00001**

1 Reagent Lane
Fair Lawn, NJ 07410
201.796.7100 tel
201.796.1329 fax

# Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by SAI Global Certificate Number CERT - 0064970

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

| | | | |
|---|---|---|---|
| **Catalog Number** | **S425** | **Quality Test / Release Date** | **7/22/2014** |
| **Lot Number** | **143808** | | |
| **Description** | **SODIUM SULFIDE, NONAHYDRATE, CERTIFIED ACS** | | |
| **Country of Origin** | **United States** | *** Suggested Retest Date** | **Jul-2019** |
| **Chemical Origin** | **Inorganic-non animal** | | |
| **BSE/TSE Comment** | No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product. | | |

| Result name | Units | Specifications | Test Value |
|---|---|---|---|
| APPEARANCE | | REPORT | Colorless crystals |
| AMMONIUM | % | <= 0.01 | <0.0050 |
| ASSAY | % | >= 98.0 | 100.2 |
| IDENTIFICATION | PASS/FAIL | = PASS TEST | PASS TEST |
| IRON (Fe) | PASS/FAIL | = PASS TEST | PASS TEST |
| SULFITE OR THIOSULFATE | % | <= 0.1 | <0.10 |

**Lab Manager Fair Lawn**

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.
*Based on suggested storage condition.

# GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job Number: 180-59091-1

SDG No.:

Project: Knoxville, Montrose, Erie Coke

| Client Sample ID | Lab Sample ID |
|---|---|
| R-1606 LOC#3 WATER QT-R1A | 180-59091-1 |
| R-1614 LOC#4 WATER QT-R1B | 180-59091-2 |
| R-1622 LOC#5 WATER QT-R1C | 180-59091-3 |
| R-1630 LOC#6 WATER QT-R2A | 180-59091-4 |
| R-1638 LOC#7 WATER QT-R2B | 180-59091-5 |
| R-1646 LOC#8 WATER QT-R2C | 180-59091-6 |
| R-1654 LOC#9 WATER QT-R3A | 180-59091-7 |
| R-1662 LOC#10 WATER QT-R3B | 180-59091-8 |
| R-1670 LOC#11 WATER QT-R3C | 180-59091-9 |

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1606 LOC#3 WATER QT-R1A
Lab Sample ID: 180-59091-1
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/22/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | 0.60 | 3.0 | 0.59 | mg/L | J | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1614 LOC#4 WATER QT-R1B
Lab Sample ID: 180-59091-2
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/22/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | ND | 3.0 | 0.59 | mg/L | | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1622 LOC#5 WATER QT-R1C
Lab Sample ID: 180-59091-3
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/22/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | 0.91 | 3.0 | 0.59 | mg/L | J | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1630 LOC#6 WATER QT-R2A
Lab Sample ID: 180-59091-4
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/23/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | ND | 3.0 | 0.59 | mg/L | | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1638 LOC#7 WATER QT-R2B
Lab Sample ID: 180-59091-5
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/23/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | ND | 3.0 | 0.59 | mg/L | | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1646 LOC#8 WATER QT-R2C
Lab Sample ID: 180-59091-6
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/23/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | ND | 3.0 | 0.59 | mg/L | | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1654 LOC#9 WATER QT-R3A
Lab Sample ID: 180-59091-7
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/26/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | 1.1 | 3.0 | 0.59 | mg/L | J | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1662 LOC#10 WATER QT-R3B
Lab Sample ID: 180-59091-8
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/26/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | ND | 3.0 | 0.59 | mg/L | | | 1 | 9034 |

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: R-1670 LOC#11 WATER QT-R3C
Lab Sample ID: 180-59091-9
Lab Name: TestAmerica Pittsburgh
Job No.: 180-59091-1
SDG ID.:
Matrix: Water
Date Sampled: 09/26/2016 00:00
Reporting Basis: WET
Date Received: 09/28/2016 09:00

| CAS No. | Analyte | Result | RL | MDL | Units | C | Q | DIL | Method |
|---|---|---|---|---|---|---|---|---|---|
| 18496-25-8 | Sulfide | ND | 3.0 | 0.59 | mg/L | | | 1 | 9034 |

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Analyst: SJM Batch Start Date: 09/29/2016

Reporting Units: mg/L Analytical Batch No.: 189622

| Sample Number | QC Type | Time | Analyte | Result | Spike Amount | (%) Recovery | Limits | Qual | Reagent |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ICV | 15:45 | Sulfide | 16.7 | 19.2 | 87 | 85-115 | | WSULFSICVCCV_00269 |
| 2 | ICB | 15:47 | Sulfide | ND | | | | | |
| 13 | CCV | 16:11 | Sulfide | 18.1 | 19.2 | 94 | 85-115 | | WSULFSICVCCV_00269 |
| 14 | CCB | 16:13 | Sulfide | ND | | | | | |
| 24 | CCV | 16:35 | Sulfide | 18.6 | 19.2 | 97 | 85-115 | | WSULFSICVCCV_00269 |
| 25 | CCB | 16:37 | Sulfide | ND | | | | | |

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

| Method | Lab Sample ID | Analyte | Result | Qual | Units | RL | Dil |
|---|---|---|---|---|---|---|---|
| Batch ID: 189622 | Date: 09/29/2016 15:49 | Prep Batch: 189581 | Date: 09/29/2016 11:00 | | | | |
| 9034 | MB 180-189581/1-A | Sulfide | ND | | mg/L | 3.0 | 1 |

FORM III-IN

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Matrix: Water

| Method | Lab Sample ID | Analyte | Result | C | Unit | Spike Amount | Pct. Rec. | Limits | RPD | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Batch ID: 189622 | Date: 09/29/2016 16:31 | | Prep Batch: 189581 | | | Date: 09/29/2016 11:00 | | | | | |
| 9034 | 180-59091-1 | Sulfide | 0.60 | J | mg/L | | | | | | |
| 9034 | 180-59091-1 MS | Sulfide | 17.4 | | mg/L | 19.2 | 87 | 75-125 | | | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Matrix: Water

| Method | Lab Sample ID | Analyte | Result | C | Unit | Spike Amount | Pct. Rec. | Limits | RPD | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Batch ID: 189622 | Date: 09/29/2016 16:33 | | Prep Batch: 189581 | | | Date: 09/29/2016 11:00 | | | | | |
| 9034 | 180-59091-1 MSD | Sulfide | 17.8 | | mg/L | 19.2 | 89 | 75-125 | 2 | 20 | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Matrix: Water

| Method | Lab Sample ID | Analyte | Result | C | Unit | Spike Amount | Pct. Rec. | Limits | RPD | RPD Limit | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Batch ID: 189622 | Date: 09/29/2016 15:51 | | Prep Batch: 189581 | | | Date: 09/29/2016 11:00 | | | | | |
| | | | | | | LCS Source: WSULFPSP_00266 | | | | | |
| 9034 | LCS 180-189581/2-A | Sulfide | 16.4 | | mg/L | 19.2 | 85 | 85-115 | | | |

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job Number: 180-59091-1

SDG Number:

Matrix: Water Instrument ID: NOEQUIP

Method: 9034 MDL Date: 01/07/2010 12:13

Prep Method: 9030B

| Analyte | Wavelength/ Mass | RL (mg/L) | MDL (mg/L) |
|---|---|---|---|
| Sulfide | | 3 | 0.5897 |

FORM IX - IN

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job Number: 180-59091-1

SDG Number:

Matrix: Water Instrument ID: NOEQUIP

Method: 9034 XMDL Date: 01/07/2010 12:13

| Analyte | Wavelength/ Mass | XRL (mg/L) | XMDL (mg/L) |
|---|---|---|---|
| Sulfide | | 3 | 0.5897 |

FORM IX - IN

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Prep Method: 9030B

| Lab Sample ID | Preparation Date | Prep Batch | Initial Weight | Initial Volume (mL) | Final Volume (mL) |
|---|---|---|---|---|---|
| MB 180-189581/1-A | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| LCS 180-189581/2-A | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-1 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-2 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-3 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-4 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-5 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-6 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-7 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-8 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-9 | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-1 MS | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |
| 180-59091-1 MSD | 09/29/2016 11:00 | 189581 | | 50.0 | 50.0 |

FORM XII-IN

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: 9034

Start Date: 09/29/2016 15:45 End Date: 09/29/2016 16:37

| Lab Sample Id | D/F | Type | Time | Analytes | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | S2 | | | | | | | | | | | | | | | | | | | | | | | |
| ICV 180-189622/1 | 1 | | 15:45 | X | | | | | | | | | | | | | | | | | | | | | | | |
| ICB 180-189622/2 | 1 | | 15:47 | X | | | | | | | | | | | | | | | | | | | | | | | |
| MB 180-189581/1-A | 1 | T | 15:49 | X | | | | | | | | | | | | | | | | | | | | | | | |
| LCS 180-189581/2-A | 1 | T | 15:51 | X | | | | | | | | | | | | | | | | | | | | | | | |
| ZZZZZZ | | | 15:53 | | | | | | | | | | | | | | | | | | | | | | | | |
| ZZZZZZ | | | 15:56 | | | | | | | | | | | | | | | | | | | | | | | | |
| ZZZZZZ | | | 15:58 | | | | | | | | | | | | | | | | | | | | | | | | |
| ZZZZZZ | | | 16:00 | | | | | | | | | | | | | | | | | | | | | | | | |
| ZZZZZZ | | | 16:02 | | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-1 | 1 | T | 16:04 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-2 | 1 | T | 16:07 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-3 | 1 | T | 16:09 | X | | | | | | | | | | | | | | | | | | | | | | | |
| CCV 180-189622/13 | 1 | | 16:11 | X | | | | | | | | | | | | | | | | | | | | | | | |
| CCB 180-189622/14 | 1 | | 16:13 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-4 | 1 | T | 16:15 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-5 | 1 | T | 16:18 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-6 | 1 | T | 16:20 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-7 | 1 | T | 16:22 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-8 | 1 | T | 16:24 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-9 | 1 | T | 16:26 | X | | | | | | | | | | | | | | | | | | | | | | | |
| ZZZZZZ | | | 16:29 | | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-1 MS | 1 | T | 16:31 | X | | | | | | | | | | | | | | | | | | | | | | | |
| 180-59091-1 MSD | 1 | T | 16:33 | X | | | | | | | | | | | | | | | | | | | | | | | |
| CCV 180-189622/24 | 1 | | 16:35 | X | | | | | | | | | | | | | | | | | | | | | | | |
| CCB 180-189622/25 | 1 | | 16:37 | X | | | | | | | | | | | | | | | | | | | | | | | |

Prep Types:
T = Total/NA

FORM XIII-IN

# GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Pittsburgh  Job No.: 180-59091-1

SDG No.:

Batch Number: 189581  Batch Start Date: 09/29/16 11:00  Batch Analyst: McDermott, Samantha J

Batch Method: 9030B  Batch End Date: 09/29/16 12:30

| Lab Sample ID | Client Sample ID | Method Chain | Basis | InitialAmount | FinalAmount | WSULFPSP 00266 | | | |
|---|---|---|---|---|---|---|---|---|---|
| MB 180-189581/1 | | 9030B, 9034 | | 50.0 mL | 50.0 mL | | | | |
| LCS 180-189581/2 | | 9030B, 9034 | | 50.0 mL | 50.0 mL | 1 mL | | | |
| 180-59091-A-1 | R-1606 LOC#3 WATER QT-R1A | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-2 | R-1614 LOC#4 WATER QT-R1B | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-3 | R-1622 LOC#5 WATER QT-R1C | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-4 | R-1630 LOC#6 WATER QT-R2A | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-5 | R-1638 LOC#7 WATER QT-R2B | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-6 | R-1646 LOC#8 WATER QT-R2C | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-7 | R-1654 LOC#9 WATER QT-R3A | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-8 | R-1662 LOC#10 WATER QT-R3B | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-9 | R-1670 LOC#11 WATER QT-R3C | 9030B, 9034 | T | 50.0 mL | 50.0 mL | | | | |
| 180-59091-A-1 MS | R-1606 LOC#3 WATER QT-R1A | 9030B, 9034 | T | 50.0 mL | 50.0 mL | 1 mL | | | |
| 180-59091-A-1 MSD | R-1606 LOC#3 WATER QT-R1A | 9030B, 9034 | T | 50.0 mL | 50.0 mL | 1 mL | | | |

| Batch Notes | |
|---|---|
| Blank Matrix ID | 1567327 |
| DI Water Dispenser ID | 08K36429 |
| Oven, Bath or Block Temperature 1 | 70 (port 14 @ 1230) Degrees C |
| Pipette ID | G1488373U |
| Sulfuric Acid Dispenser ID | 11E38354 |
| Sulfuric Acid Reagent ID Number | 2039661 |
| Thermometer ID | 122503737 |
| Zinc Acetate Dispenser ID | 11G36429 |
| Zinc Acetate Buffer ID | 2085289 |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

# GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Batch Number: 189581 Batch Start Date: 09/29/16 11:00 Batch Analyst: McDermott, Samantha J

Batch Method: 9030B Batch End Date: 09/29/16 12:30

| Basis | Basis Description |
|---|---|
| T | Total/NA |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

# GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Pittsburgh  Job No.: 180-59091-1

SDG No.:

Batch Number: 189622  Batch Start Date: 09/29/16 15:45  Batch Analyst: McDermott, Samantha J

Batch Method: 9034  Batch End Date: 09/29/16 16:40

| Lab Sample ID | Client Sample ID | Method Chain | Basis | FinalAmount | IodineAmount | BuretStart1 | BuretStop1 | TitrantVolume1 | CalcMsg |
|---|---|---|---|---|---|---|---|---|---|
| ICV 180-189622/1 | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 7.78 mL | 7.78 mL | OK |
| ICB 180-189622/2 | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 10.07 mL | 10.07 mL | OK |
| MB 180-189581/1-A | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 10.05 mL | 10.05 mL | OK |
| LCS 180-189581/2-A | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 7.82 mL | 7.82 mL | OK |
| 180-59091-A-1-A | R-1606 LOC#3 WATER QT-R1A | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.88 mL | 9.88 mL | OK |
| 180-59091-A-2-A | R-1614 LOC#4 WATER QT-R1B | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.90 mL | 9.9 mL | OK |
| 180-59091-A-3-A | R-1622 LOC#5 WATER QT-R1C | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.84 mL | 9.84 mL | OK |
| CCV 180-189622/13 | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 7.60 mL | 7.6 mL | OK |
| CCB 180-189622/14 | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 9.99 mL | 9.99 mL | OK |
| 180-59091-A-4-A | R-1630 LOC#6 WATER QT-R2A | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.92 mL | 9.92 mL | OK |
| 180-59091-A-5-A | R-1638 LOC#7 WATER QT-R2B | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.89 mL | 9.89 mL | OK |
| 180-59091-A-6-A | R-1646 LOC#8 WATER QT-R2C | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.92 mL | 9.92 mL | OK |
| 180-59091-A-7-A | R-1654 LOC#9 WATER QT-R3A | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.81 mL | 9.81 mL | OK |
| 180-59091-A-8-A | R-1662 LOC#10 WATER QT-R3B | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.91 mL | 9.91 mL | OK |
| 180-59091-A-9-A | R-1670 LOC#11 WATER QT-R3C | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 9.89 mL | 9.89 mL | OK |
| 180-59091-A-1-B MS | R-1606 LOC#3 WATER QT-R1A | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 7.69 mL | 7.69 mL | OK |
| 180-59091-A-1-C MSD | R-1606 LOC#3 WATER QT-R1A | 9034 | T | 50.0 mL | 10.0 mL | 0.00 mL | 7.64 mL | 7.64 mL | OK |
| CCV 180-189622/24 | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 7.54 mL | 7.54 mL | OK |
| CCB 180-189622/25 | | 9034 | | 50.0 mL | 10.0 mL | 0.00 mL | 9.98 mL | 9.98 mL | OK |

| Lab Sample ID | Client Sample ID | Method Chain | Basis | WSULFSICVCCV 00269 | | | | | |
|---|---|---|---|---|---|---|---|---|---|

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Pittsburgh Job No.: 180-59091-1

SDG No.:

Batch Number: 189622 Batch Start Date: 09/29/16 15:45 Batch Analyst: McDermott, Samantha J

Batch Method: 9034 Batch End Date: 09/29/16 16:40

| Lab Sample ID | Client Sample ID | Method Chain | Basis | WSULFSICVCCV 00269 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ICV 180-189622/1 | | 9034 | | 1 mL | | | | | |
| ICB 180-189622/2 | | 9034 | | | | | | | |
| MB 180-189581/1-A | | 9034 | | | | | | | |
| LCS 180-189581/2-A | | 9034 | | | | | | | |
| 180-59091-A-1-A | R-1606 LOC#3 WATER QT-R1A | 9034 | T | | | | | | |
| 180-59091-A-2-A | R-1614 LOC#4 WATER QT-R1B | 9034 | T | | | | | | |
| 180-59091-A-3-A | R-1622 LOC#5 WATER QT-R1C | 9034 | T | | | | | | |
| CCV 180-189622/13 | | 9034 | | 1 mL | | | | | |
| CCB 180-189622/14 | | 9034 | | | | | | | |
| 180-59091-A-4-A | R-1630 LOC#6 WATER QT-R2A | 9034 | T | | | | | | |
| 180-59091-A-5-A | R-1638 LOC#7 WATER QT-R2B | 9034 | T | | | | | | |
| 180-59091-A-6-A | R-1646 LOC#8 WATER QT-R2C | 9034 | T | | | | | | |
| 180-59091-A-7-A | R-1654 LOC#9 WATER QT-R3A | 9034 | T | | | | | | |
| 180-59091-A-8-A | R-1662 LOC#10 WATER QT-R3B | 9034 | T | | | | | | |
| 180-59091-A-9-A | R-1670 LOC#11 WATER QT-R3C | 9034 | T | | | | | | |
| 180-59091-A-1-B MS | R-1606 LOC#3 WATER QT-R1A | 9034 | T | | | | | | |
| 180-59091-A-1-C MSD | R-1606 LOC#3 WATER QT-R1A | 9034 | T | | | | | | |
| CCV 180-189622/24 | | 9034 | | 1 mL | | | | | |
| CCB 180-189622/25 | | 9034 | | | | | | | |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

# GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Pittsburgh  Job No.: 180-59091-1

SDG No.:

Batch Number: 189622  Batch Start Date: 09/29/16 15:45  Batch Analyst: McDermott, Samantha J

Batch Method: 9034  Batch End Date: 09/29/16 16:40

| Batch Notes | |
|---|---|
| HCl Concentration | 6 |
| Lot # of hydrochloric acid | 2052619 |
| Iodine Lot Number | 2008119 |
| Iodine Vendor | LC15620 |
| Normality of Iodine Solution | 0.0239 N |
| Sodium Thiosulfate Reagent ID Number | 2008123 |
| Pipette ID | G1488373U B524057767 |
| Perform Calculation (0=No, 1=Yes) | 1 |
| Starch Lot Number | F083-02 |
| Starch Vendor | 1990187 |
| Normality of First Titrant | 0.0240 N |
| Zinc Acetate Buffer ID | 2085289 |

| Basis | Basis Description |
|---|---|
| T | Total/NA |

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

**Sulfide Titrant Normality Calculation** Controlled Document **PT-WC-WS-011_R0** issued 11/24/2015

for methods 9034 calc, 9034 AIS and SM4500 S2F

**Sodium Thiosulfate Standardization**

Titrate 10 mL of 0.025N potassium biiodate solution to a clear endpoint

| | |
|---|---|
| mL Titration 1: | 10.4 |
| mL Titration 2: | 10.44 |
| mL Titration 3: | 10.38 |
| Avg mL: | 10.4067 |
| **Na2S2O3 N:** | 0.0240 |

Na2S2O3 N = (10 mL KH(IO3)2)(0.025N) / **X** mL Na2S2O3

**Iodine Standardization**

Titrate 20mL of iodine solution to clear endpoint using the standardized sodium thiosulfate titrant

| | |
|---|---|
| mL Titration 1: | 19.89 |
| mL Titration 2: | 19.88 |
| mL Titration 3: | 19.87 |
| Avg mL: | 19.8800 |
| **Iodine N:** | 0.0239 |

Iodine N = (**Y** mL Na2S2O3)(N Na2S2O3) / 20 mL

calibration date 9/29/2016

9/30/2014

SM

10.40
10.44
10.38

# General Chemistry Worksheet

Batch Number: 180-189622
Method: 9034
Analyst: McDermott, Samantha J

Date Open: Sep 29 2016 ~~1:47PM~~ 3:45pm Waters.
Batch End: 4:40pm

| Lab ID | Client ID | Method Chain | Basis | Final weight/volume of sample | Amount of Iodine | First additional Buret Start volume | Calculation Message | WSULFSICVCCV_00269 |
|---|---|---|---|---|---|---|---|---|
| ICV~180-189622/1 | | 9034_Calc | | 50.0 mL 7.78 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | 1.00 mL |
| ICB~180-189622/2 | | 9034_Calc | | 50.0 mL 10.07 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| MB~180-189581/1-A | | 9034_Calc | | 50.0 mL 10.05 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| LCS~180-189581/2-A | | 9034_Calc | | 50.0 mL 7.82 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59056-G-2-A | | 9034_Calc | T | 50.0 mL 9.43 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59056-G-3-A | | 9034_Calc | T | 50.0 mL 10.07 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59056-G-6-A | | 9034_Calc | T | 50.0 mL 10.01 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59056-G-7-A | | 9034_Calc | T | 50.0 mL 10.02 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59056-G-8-A | | 9034_Calc | T | 50.0 mL 10.07 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-1-A | | 9034_Calc | T | 50.0 mL 9.88 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-2-A | | 9034_Calc | T | 50.0 mL 9.90 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-3-A | | 9034_Calc | T | 50.0 mL 9.84 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| CCV~180-189622/13 | | 9034_Calc | | 50.0 mL 7.60 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | 1.00 mL |
| CCB~180-189622/14 | | 9034_Calc | | 50.0 mL 9.99 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-4-A | | 9034_Calc | T | 50.0 mL 9.92 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-5-A | | 9034_Calc | T | 50.0 mL 9.89 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-6-A | | 9034_Calc | T | 50.0 mL 9.92 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-7-A | | 9034_Calc | T | 50.0 mL 9.81 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-8-A | | 9034_Calc | T | 50.0 mL 9.91 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-9-A | | 9034_Calc | T | 50.0 mL 9.89 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59046-L-5-A | | 9034_Calc | T | 50.0 mL 9.98 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-1-B~MS | | 9034_Calc | T | 50.0 mL 7.69 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| 180-59091-A-1-C~MSD | | 9034_Calc | T | 50.0 mL 7.64 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |
| CCV~180-189622/24 | | 9034_Calc | | 50.0 mL 7.54 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | 1.00 mL |
| CCB~180-189622/25 | | 9034_Calc | | 50.0 mL 9.98 | 10.0 mL | 0.00 mL | Iodine Norm. is blank | |

| | |
|---|---|
| Perform Calculation (0=No, 1=Yes): | 1 |
| HCl Concentration: | 6 |
| Lot # of hydrochloric acid: | 2052619 |
| Zinc Acetate Buffer ID: | 2085289 |
| Starch Lot Number: | F083-02 |
| Starch Vendor: | 1990187 |
| Iodine Lot Number: | 2008119 |

| | |
|---|---|
| Iodine Vendor: | LC15620 |
| Sodium Thiosulfate Reagent ID Number: | 2008123 |
| Pipette ID: | G1488373U B524057767 |

19.89
19.88
19.87

# Shipping and Receiving Documents

TestAmerica Laboratories, Inc.
Knoxville Laboratory

**SAMPLE ANALYSIS REQUISITION**

Lab Request: SR128732

## Laboratory: TestAmerica Pittsburgh

301 Alpha Drive RIDC Park
Pittsburgh, PA 15238

## Report Package: Expanded Deliverables

Need Analytical Report: 10/14/16

Knoxville Project Manager: KEVIN WOODCOCK

Client Code: 1470919

| Client Sample ID | Lab Work Order # | Lab Internal ID | Sampling Date/Time | Analysis Required |
|---|---|---|---|---|
| R-1606 LOC#3 WATER QT-R1A | M891A | H6I270413-1 | 09/22/16 00:00 | TOTAL SULFIDES |
| R-1606 LOC#3 WATER QT-R1A | M891A | H6I270413-1D | 09/22/16 00:00 | MSD |
| R-1606 LOC#3 WATER QT-R1A | M891A | H6I270413-1S | 09/22/16 00:00 | MS |
| R-1614 LOC#4 WATER QT-R1B | M891C | H6I270413-2 | 09/22/16 00:00 | |
| R-1622 LOC#5 WATER QT-R1C | M891D | H6I270413-3 | 09/22/16 00:00 | |
| R-1630 LOC#6 WATER QT-R2A | M891E | H6I270413-4 | 09/23/16 00:00 | |
| R-1638 LOC#7 WATER QT-R2B | M891F | H6I270413-5 | 09/23/16 00:00 | |
| R-1646 LOC#8 WATER QT-R2C | M891G | H6I270413-6 | 09/23/16 00:00 | |
| R-1654 LOC#9 WATER QT-R3A | M891H | H6I270413-7 | 09/26/16 00:00 | |
| R-1662 LOC#10 WATER QT-R3B | M891J | H6I270413-8 | 09/26/16 00:00 | |
| R-1670 LOC#11 WATER QT-R3C | M891K | H6I270413-9 | 09/26/16 00:00 | |

Copy of Client chain-of-custody is maintained by TestAmerica Knoxville
Need detection limit and analysis date included in report
Please send a signed copy of this form with the report at completion of analysis

Relinquished by: [signature] Date/Time: 9-27-16 16:00

Relinquished by: _____ Date/Time: _____

Received for lab by: Dallu Watson TAP Date/Time: 9-28-16 9:00

KNXPM_SampleAnalysisRequest.rdl - v2.0

Shipping Mail

180-59091 Chain of Custody

TestAmerica

THE LEADER IN ENVIRO... STING

T2 EXP 05/17

RT 197 1 10:30 A 2738 09.28

FZ

ORIGIN ID:RKWA (865) 3000
SAMPLE CONTROL
TESTAMERICA
5815 MIDDLEBROOK PIKE

KNOXVILLE, TN 37921
UNITED STATES US

SHIP DATE: 27SEP16
ACTWGT: 31.7 LB
CAD: 440898/CAFE2912
DIMS: 14x9x14 IN

BILL SENDER

180-59091 Waybill

TO **RECEIVING**
**TESTAMERICA**
**301 ALPHA DRIVE**
**RIDC PARK**
**PITTSBURGH PA 15238**
(412) 963-7058
DEPT: 140320

REF: H61270413

538C1/A053/3298

FedEx Express

J15131508130 1ev

**WED - 28 SEP 10:30A**
**PRIORITY OVERNIGHT**

TRK# 0201 **6628 8181 2738**

# NA AGCA

**15238**
PA-US **PIT**

Uncorrected temp 3.1 °C
Thermometer ID 1

CF 0 Initials TB

PT-WI-SR-001 effective 7/26/13

# Login Sample Receipt Checklist

Client: TestAmerica Laboratories, Inc.

Job Number: 180-59091-1

**Login Number: 59091**
**List Number: 1**
**Creator: Watson, Debbie**

**List Source: TestAmerica Pittsburgh**

| 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. | False | |
| 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"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Sample Receipt Documentation

# Request for Analysis/Chain-of-Custody – RFA/COC #004
## Montrose Air Quality Services LLC
## Coke ICR Testing on Dust and Water Samples

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

H6I270413

| **Project Identification:** | **Montrose Air Quality Services Coke ICR** |
|---|---|
| Client Contact: | Mr. Matthew Dallesasse (Montrose) (412) 826-3636 |
| TestAmerica Contact: | Ms. Courtney Adkins (865) 291-3019 |
| TestAmerica Project Manager: | Mr. Kevin Woodcock (865) 291-3082 |

| **Laboratory Deliverable Turnaround Requirements:** | |
|---|---|
| Analytical Due Date: (Review-Released Data) | 21 Days from Lab Receipt |
| Data Package Due Date: | 28 Days from Lab Receipt |
| **Media Request Form No.:** | 083016-8 |
| **Laboratory Destination:** | TestAmerica Knoxville 5815 Middlebrook Pike Knoxville, Tennessee 37921 (865) 291-3000 |
| **Courier:** | TestAmerica Courier Service |

**Analytical Testing QC Requirements:**
The Legend for Project-Specific Quality Control Testing is designated in the "QC" column as follows: "MS" = Matrix Spike, "MSD" = Matrix Spike Duplicate, "DUP" = Duplicate, "PDS" = Post Digestion Spike and "PDSD" = Post Digestion Spike Duplicate

**Project Deliverables:**
Report analytical results on Quantims R-02 and TALS Reports and in data packages. Include "Field Sample Number", "Sample Type", and "Run Number" on all Reports.

| **Analytical Parameter:** | **Holding Time Requirements:** | **Preservation Requirements:** |
|---|---|---|
| Sulfides | 7 Days to Analysis | Zinc Acetate, NaOH to pH > 9, Cool, 4°C |

| **Field Sample No./Sample Coding ID** | **Loc. No.** | **Sample Collection Date** | **Project QC Require-ments** | **Sample Bottle/ Container** | **Sample Type** | **Analytical Specifications** |
|---|---|---|---|---|---|---|
| R-1606 Loc #3 Water QT-R1A | 3 | 9/22/16 | MS/MSD | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #3** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1614 Loc #4 Water QT-R1B | 4 | 9/22/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #4** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1622 Loc #5 Water QT-R1C | 5 | 9/22/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #5** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1630 Loc #6 Water QT-R2A | 6 | 9/23/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #6** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1638 Loc #7 Water QT-R2B | 7 | 9/23/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #7** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |

# Request for Analysis/Chain-of-Custody – RFA/COC #004
## Montrose Air Quality Services LLC
## Coke ICR Testing on Dust and Water Samples

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Field Sample No./Sample Coding ID | Loc. No. | Sample Collection Date | Project QC Require-ments | Sample Bottle/ Container | Sample Type | Analytical Specifications |
|---|---|---|---|---|---|---|
| R-1646 Loc #8 Water QT-R2C | 8 | 9/23/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #8** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1654 Loc #9 Water QT-R3A | 9 | 9/26/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #9** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1662 Loc #10 Water QT-R3B | 10 | 9/26/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #10** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |
| R-1670 Loc #11 Water QT-R3C | 11 | 9/26/16 | | 500 mL Narrow Mouth Nalgene/HDPE | **Water Sample** **Location #11** Sulfides Analysis | Analyze this sample for Sulfides by SW-846 Compendium Method 9034. |

**Request for Analysis/Chain-of-Custody – RFA/COC #004**
**Montrose Air Quality Services LLC**
**Coke ICR Testing on Dust and Water Samples**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

## Sample Receipt Log and Condition of the Samples Upon Receipt:

| Please fill in the following information: | Comments (Please write "NONE" if no comment applicable) |
|---|---|
| (1) Record the identities of any samples that were listed on the RFA but were not found in the sample shipment. | NONE |
| (2) Record the sample shipping cooler temperature of all coolers transporting samples listed on this RFA: | RT 3.7, 4.8, 3.3, 4.4 / CT 3.7, 4.8, 3.3, 4.4 |
| (3) Record any apparent sample loss/breakage. | NONE |
| (4) Record any unidentified samples transported with this shipment of samples: | NONE |
| (5) Indicate if all samples were received according to the project's required specifications (i.e. no nonconformances): | HAND DELIVERED, CUSTODY SEALS INTACT |

## Custody Transfer:

| | Name | Company | Date/Time |
|---|---|---|---|
| Relinquished By: | [illegible] | Montrose | 9/26/16 11:00 |
| Accepted By: | [illegible] | TestAmerica | 9/26/16 11:00 |
| Relinquished By: | [illegible] | Test America | 9/26/16 21:57 |
| Accepted By: | [illegible] | TA Knx | 9/26/16 21:57 |
| Relinquished By: | | | |
| Accepted By: | | | |
| Relinquished By: | | | |
| Accepted By: | | | |

**TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST**

**Log In Number:** H6I270413

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Are the shipping containers intact? | ✓ | | | ☐ **Containers, Broken** |
| 2. Were ambient air containers received intact? | | | ✓ | ☐ Checked in lab |
| 3. The coolers/containers custody seal if present, is it intact? | ✓ | | | ☐ Yes<br>☐ NA |
| 4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : S161<br>Correction factor: 0.0 | ✓ | | | ☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel**<br>☐ **Cooler Out of Temp, Same Day Receipt** |
| 5. Were all of the sample containers received intact? | ✓ | | | ☐ **Containers, Broken** |
| 6. Were samples received in appropriate containers? | ✓ | | | ☐ **Containers, Improper; Client Contacted; Proceed/Cancel** |
| 7. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **COC & Samples Do Not Match**<br>☐ **COC Incorrect/Incomplete**<br>☐ **COC Not Received** |
| 8. Were all of the samples listed on the COC received? | ✓ | | | ☐ **Sample Received, Not on COC**<br>☐ **Sample on COC, Not Received** |
| 9. Is the date/time of sample collection noted? | ✓ | | | ☐ **COC; No Date/Time; Client Contacted** |
| 10. Was the sampler identified on the COC? | | | ✓ | ☐ **Sampler Not Listed on COC** |
| 11. Is the client and project name/# identified? | ✓ | | | ☐ **COC Incorrect/Incomplete** |
| 12. Are tests/parameters listed for each sample? | ✓ | | | ☐ **COC No tests on COC** |
| 13. Is the matrix of the samples noted? | ✓ | | | ☐ **COC Incorrect/Incomplete** |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **COC Incorrect/Incomplete** |
| 15. Were samples received within holding time? | ✓ | | | ☐ **Holding Time - Receipt** |
| 16. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **pH Adjusted, pH Included (See box 16A)**<br>☐ **Incorrect Preservative** |
| 17. Were VOA samples received without headspace? | | | ✓ | ☐ **Headspace (VOA only)** |
| 18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: | | | ✓ | ☐ **Residual Chlorine** |
| 19. For 1613B water samples is pH<9? | | | ✓ | ☐ If no, lab will adjust |
| 20. For rad samples was sample activity info. Provided? | | | ✓ | ☐ Project missing info |

**Comments/Actions Taken**

**Labeling Verified by:** **Date:**

**pH test strip lot number:**

| Box 16A: pH Preservation | Box 18A: Residual Chlorine |
|---|---|
| Preservative: | |
| Lot Number: | |
| Exp Date: | |
| Analyst: | |
| Date: | |
| Time: | |

Project #: 92425 PM Instructions: NA

Sample Receiving Associate: [signature] Date: ~~9-26-16~~ 9-27-16 BN 9/27-16

QA026R30.doc, 080916