

The order of this data package is as follows:

1. Chain-of-Custody/Lab Request
2. Copies of field COCs
3. Validation Report
4. Laboratory analysis

Comments:

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129413

WORK ORDER:

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected (MM/DD/YYYY): | NA | 02/21/2017 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | ↓ | 1220 | MEDIA: | UA | ↓ |
| PRS ID: | ↓ | OK | SAMPLE TECH CODE: | GSP | ↓ |
| LOCATION ID: | R-50 S1 | ↓ | FIELD PREP: | F | ↓ |
| LOCATION TYPE: | NA | ↓ | FIELD QC TYPE: | REG | ↓ |
| TOP DEPTH: | ↓ | ↓ | SAMPLE USAGE: | INV | ↓ |
| BOTTOM DEPTH: | ↓ | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|------------------------------|-----------------------|---|--------------|---------------|----------------------|
| NA | WSP-All Metals | 1 LITER POLY | 1 | HNO3 ICE | Y | NA |
| ↓ | WSP-CR52/53 | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP- GENINORG+PerChlorate | 1 LITER POLY | 1 | ICE | ↓ | ↓ |
| ↓ | WSP- NH3+NO3/NO2 | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV
 pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C
 Turbidity _____ NTU

COLLECTED BY (PRINT): W. Sanchez

| | | | |
|---|------------------------------|--|-------------------------------|
| RELINQUISHED BY (Printed Name) Austin Tush (Signature) <i>Austin Tush</i> | Date/Time 2/21/17 1330 | RECEIVED BY <i>Sherwood</i> (Printed Name) <i>Sherwood</i> (Signature) <i>Sherwood</i> | Date/Time 2/21/17 13:30 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 01/18/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129317

WORK ORDER:

| | AS PLANNED | AS COLLECTED | | AS PLANNED | AS COLLECTED |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected (MM/DD/YYYY): | NA | 02/21/2017 | FIELD MATRIX: | WG | OK |
| TIME COLLECTED (HH:MM): | ↓ | 1220 | MEDIA: | UA | ↓ |
| PRS ID: | ↓ | OK | SAMPLE TECH CODE: | GSP | ↓ |
| LOCATION ID: | R-50 S1 | ↓ | FIELD PREP: | UF | ↓ |
| LOCATION TYPE: | NA | ↓ | FIELD QC TYPE: | REG | ↓ |
| TOP DEPTH: | ↓ | ↓ | SAMPLE USAGE: | INV | ↓ |
| BOTTOM DEPTH: | ↓ | ↓ | EXCAVATED: | | YES / NO / NA |

| PRIORITY | ORDER | CONTAINER | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|-------------|--------------------|---|--------------|---------------|----------------------|
| NA | MSGP-Hg | 1 LITER POLY | 1 | HNO3 | Y | NA |
| ↓ | WSP-CN(T) | 250 ML POLY | 1 | NAOH | ↓ | ↓ |
| ↓ | WSP-TKN+TOC | 500 ML AMBER GLASS | 1 | H2SO4 | ↓ | ↓ |

SAMPLE COMMENTS: None

LOCATION COMMENTS: Sampled 40' From running diesel generator

FIELD PARAMETERS:

| | | | | | | | | |
|------------------|------|------|----------------------|-------|-------|-------------------------------|-------|-------|
| Dissolved Oxygen | 6.23 | mg/L | Flow (in gpm) | 2.48 | GPM | Oxidation-Reduction Potential | 204.3 | mV |
| pH | 7.80 | SU | Specific Conductance | 185.2 | uS/cm | Temperature | 20.3 | deg C |
| Turbidity | 0.50 | NTU | | | | | | |

COLLECTED BY (PRINT): W. Pryce

| | | | |
|--|------------------------------|--|-------------------------------|
| RELINQUISHED BY (Printed Name) Austin Tosh (Signature) Austin Tosh | Date/Time 2/21/17 1330 | RECEIVED BY (Printed Name) S. Sherwood (Signature) S. Sherwood | Date/Time 2/21/17 13:30 |
| RELINQUISHED BY (Printed Name) (Signature) | Date/Time | RECEIVED BY (Printed Name) (Signature) | Date/Time |

Report Date: 01/18/2017

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1060

1. Distribution Of Samples In EDD.

| SDG | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|--------|-------------------|-----------------|------------------|-------------|--------------|------------------|
| 417150 | EPA:120.1 | 1 | | | | |
| 417150 | EPA:150.1 | 1 | | | | |
| 417150 | EPA:160.1 | 1 | | | | |
| 417150 | EPA:245.2 | 2 | | | | |
| 417150 | EPA:300.0 | 1 | | | | |
| 417150 | EPA:310.1 | 1 | | | | |
| 417150 | EPA:335.4 | 1 | | | | |
| 417150 | EPA:350.1 | 1 | | | | |
| 417150 | EPA:351.2 | 1 | | | | |
| 417150 | EPA:353.2 | 1 | | | | |
| 417150 | EPA:365.4 | 1 | | | | |
| 417150 | SM:A2340B | 1 | | | | |
| 417150 | SW-846:6010C | 1 | | | | |
| 417150 | SW-846:6020 | 1 | | | | |
| 417150 | SW-846:6850 | 1 | | | | |
| 417150 | SW-846:9060 | 1 | | | | |

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 417150 | EPA:120.1 | 1642194 | 1642194 | 1 | | | | | | | | | | 1 | | | 1 | | | | |
| 417150 | EPA:150.1 | 1642723 | 1642723 | 1 | | | | | | | | | | 1 | | | 1 | | | | |
| 417150 | EPA:160.1 | 1642893 | 1642893 | 1 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 417150 | EPA:245.2 | 1644167 | 1644166 | 2 | | | | | 1 | 2 | | | | 1 | | | 2 | | | | |
| 417150 | EPA:300.0 | 1641697 | 1641697 | 1 | | | | | 1 | | | | | 1 | | | 1 | | | | |
| 417150 | EPA:310.1 | 1642724 | 1642724 | 1 | | | | | | 1 | | | | 1 | | | 1 | | | | |
| 417150 | EPA:335.4 | 1642782 | 1642781 | 1 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |
| 417150 | EPA:350.1 | 1642884 | 1642883 | 1 | | | | | 1 | 1 | | | | 1 | | | 1 | | | | |

DATA VALIDATION REPORT

| SDG | Analytical Method | Analysis Lot ID | Prep Lot ID | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks | Method Blanks | Matrix Spikes | Matrix Spike Dups | Analytical Spikes | Post-Digestion Spikes | Lab Control Samples | Lab Control Sample Dups | Blank Spike | Blank Spike Dups | Lab Duplicates | Storage Blanks | Preparation Blanks | Reagent Blanks |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 417150 | EPA:351.2 | 1640306 | 1640305 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 417150 | EPA:353.2 | 1642890 | 1642890 | 1 | | | | | 1 | | | | | 1 | | | | 2 | | | |
| 417150 | EPA:365.4 | 1642869 | 1642868 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 417150 | SM:A2340B | 1649345 | 1649345 | 1 | | | | | | | | | | | | | | | | | |
| 417150 | SW-846:6010C | 1641876 | 1641875 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 417150 | SW-846:6020 | 1641873 | 1641872 | 1 | | | | | 1 | 1 | | | | 1 | | | | 1 | | | |
| 417150 | SW-846:6850 | 1644349 | 1644348 | 1 | | | | | 1 | 1 | 1 | | | 1 | | | | | | | |
| 417150 | SW-846:9060 | 1641867 | 1641867 | 1 | | | | | 1 | | | | | 1 | | | | 1 | | | |

2. Distribution Of Analytes In EDD.

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-17-129298 | 1203734868 | DUP | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| EPA:120.1 | GENERAL CHEMISTRY | LCS | 1203734867 | LCS | 0 | 0 | 1 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | CASA-17-130020 | 1203736202 | DUP | 1 | 0 | 0 | 0 |
| EPA:150.1 | GENERAL CHEMISTRY | LCS | 1203736201 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-17-129303 | 1203736565 | DUP | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | LCS | 1203736564 | LCS | 0 | 0 | 1 | 0 |
| EPA:160.1 | GENERAL CHEMISTRY | MB | 1203736563 | MB | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-17-129302 | 1203739596 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-17-129302 | 1203739598 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | CAMO-17-129303 | 1203739597 | DUP | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-17-129303 | 1203739599 | MS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | CAMO-17-129317 | 417150001 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| EPA:245.2 | INORGANIC | LCS | 1203739595 | LCS | 0 | 0 | 1 | 0 |
| EPA:245.2 | INORGANIC | MB | 1203739594 | MB | 1 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-17-129303 | 1203733884 | DUP | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 4 | 0 | 0 | 0 |
| EPA:300.0 | GENERAL CHEMISTRY | LCS | 1203733883 | LCS | 0 | 0 | 4 | 0 |

DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:300.0 | GENERAL CHEMISTRY | MB | 1203733882 | MB | 4 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CASA-17-130020 | 1203736204 | DUP | 2 | 0 | 0 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | CASA-17-130020 | 1203736205 | MS | 0 | 0 | 1 | 0 |
| EPA:310.1 | GENERAL CHEMISTRY | LCS | 1203736203 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-17-129317 | 1203736328 | DUP | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-17-129317 | 1203736332 | MS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | CAMO-17-129317 | 417150001 | REG | 1 | 0 | 0 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | LCS | 1203736326 | LCS | 0 | 0 | 1 | 0 |
| EPA:335.4 | GENERAL CHEMISTRY | MB | 1203736325 | MB | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-17-129303 | 1203736535 | DUP | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-17-129303 | 1203736537 | MS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | LCS | 1203736534 | LCS | 0 | 0 | 1 | 0 |
| EPA:350.1 | GENERAL CHEMISTRY | MB | 1203736533 | MB | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-17-129317 | 417150001 | REG | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-17-129356 | 1203730617 | DUP | 1 | 0 | 0 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | CAMO-17-129356 | 1203730620 | MS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | LCS | 1203730614 | LCS | 0 | 0 | 1 | 0 |
| EPA:351.2 | GENERAL CHEMISTRY | MB | 1203730613 | MB | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-17-129303 | 1203736559 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-17-129413 | 1203736560 | DUP | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | LCS | 1203736558 | LCS | 0 | 0 | 1 | 0 |
| EPA:353.2 | GENERAL CHEMISTRY | MB | 1203736557 | MB | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-17-129303 | 1203736515 | DUP | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-17-129303 | 1203736516 | MS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | LCS | 1203736514 | LCS | 0 | 0 | 1 | 0 |
| EPA:365.4 | GENERAL CHEMISTRY | MB | 1203736513 | MB | 1 | 0 | 0 | 0 |
| SM:A2340B | INORGANIC | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-17-129303 | 1203734215 | DUP | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | CAMO-17-129303 | 1203734216 | MS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | CAMO-17-129413 | 417150002 | REG | 17 | 0 | 0 | 0 |
| SW-846:6010C | INORGANIC | LCS | 1203734214 | LCS | 0 | 0 | 17 | 0 |
| SW-846:6010C | INORGANIC | MB | 1203734213 | MB | 17 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-17-129303 | 1203734210 | DUP | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | CAMO-17-129303 | 1203734211 | MS | 0 | 0 | 11 | 0 |
| SW-846:6020 | INORGANIC | CAMO-17-129413 | 417150002 | REG | 11 | 0 | 0 | 0 |
| SW-846:6020 | INORGANIC | LCS | 1203734209 | LCS | 0 | 0 | 11 | 0 |

DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| SW-846:6020 | INORGANIC | MB | 1203734208 | MB | 11 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-17-129302 | 1203739945 | MS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-17-129302 | 1203739946 | MSD | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | CAMO-17-129413 | 417150002 | REG | 1 | 0 | 0 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | LCS | 1203739944 | LCS | 0 | 0 | 1 | 0 |
| SW-846:6850 | LCMS/MS PERCHLORATE | MB | 1203739943 | MB | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-17-129317 | 1203738019 | DUP | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | CAMO-17-129317 | 417150001 | REG | 1 | 0 | 0 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | LCS | 1203738018 | LCS | 0 | 0 | 1 | 0 |
| SW-846:9060 | GENERAL CHEMISTRY | MB | 1203738017 | MB | 1 | 0 | 0 | 0 |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

| Blank FS ID | Blank Lab Sample | Blank Type | Analytical Method | Sample | Parameter Name | Blank Lab Result | Lab Qualifier | Blank Lab Units | Blank Lab Detection Limit |
|-------------|------------------|--------------|-------------------|--------|---------------------|------------------|---------------|-----------------|---------------------------|
| MB | 1203734213 | METHOD BLANK | SW-846:6010C | W | Barium | 2.68 | J | ug/L | 5.00 |
| MB | 1203734213 | METHOD BLANK | SW-846:6010C | W | Potassium | -51.5 | J | ug/L | 150 |
| MB | 1203736533 | METHOD BLANK | EPA:350.1 | W | Ammonia as Nitrogen | 0.0175 | J | mg/L | 0.050 |
| MB | 1203739594 | METHOD BLANK | EPA:245.2 | W | Mercury | -0.069 | J | ug/L | 0.200 |

DATA VALIDATION REPORT

| Field Sample ID | Blank Lab ID | Blank Type | Analytical Method | Parameter Name | Blank Lab Result | Blank Lab Units | Lab Result | Lab Qualifier | Lab Detection Limit | Detect Flag | Detect to Nondetect Factor | Detect to Estimated Factor | Uncertainty Factors |
|-----------------|--------------|--------------|-------------------|---------------------|------------------|-----------------|------------|---------------|---------------------|-------------|----------------------------|----------------------------|---------------------|
| CAMO-17-129317 | 1203739594 | METHOD BLANK | EPA:245.2 | Mercury | -0.069 | ug/L | 0.200 | U | 0.200 | N | 5 | 100 | Y |
| CAMO-17-129413 | 1203739594 | METHOD BLANK | EPA:245.2 | Mercury | -0.069 | ug/L | 0.200 | U | 0.200 | N | 5 | 100 | Y |
| CAMO-17-129413 | 1203736533 | METHOD BLANK | EPA:350.1 | Ammonia as Nitrogen | 0.0175 | mg/L | 0.0626 | | 0.050 | Y | 5 | 100 | Y |
| CAMO-17-129413 | 1203734213 | METHOD BLANK | SW-846:6010C | Potassium | -\$1.5 | ug/L | 1320 | | 150 | Y | | | |

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

| Field Sample ID | MS Lab Sample ID | MSD Lab Sample ID | Analytical Method | Parameter Name | Analysis Lot ID | Analysis Date | Sample Matrix | MS Spike Recovery | MSD Spike Recovery | MS Upper Limit | MS Lower Limit | MS Reject Limit | RPD | RPD Limit |
|-----------------|------------------|-------------------|-------------------|-------------------------|-----------------|---------------|---------------|-------------------|--------------------|----------------|----------------|-----------------|-----|-----------|
| CAMO-17-129356 | 1203730620 | | EPA:351.2 | Total Kjeldahl Nitrogen | 1640305 | 03-02-2017 | W | 85.6 | | 110 | 90 | 10 | | |
| CAMO-17-129303 | 1203734211 | | SW-846:6020 | Chromium | 1641872 | 03-16-2017 | W | 154 | | 125 | 75 | 10 | | |

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

DATA VALIDATION REPORT

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite | Analytical Method | Parameter Name | Lab Qualifier | Validation Qualifier | Validation Reason Code | Detect Flag | Lab Result | Lab Units | Report Result | Report Units | Report MDA | Report Uncertainty | Lab Matrix | Sample Date | Percent | Analysis Lot ID | Validation Status Code | Use Flag |
|-------------|------------|-----------------|----------------|--------------------|-------------------|-------------------|---------------------|---------------|----------------------|------------------------|-------------|------------|-----------|---------------|--------------|------------|--------------------|------------|-------------|---------|-----------------|------------------------|----------|
| R-50 S1 | 2017-1060 | CAMO-17-129413 | REG | INIT | GENERAL CHEMISTRY | EPA:350.1 | Ammonia as Nitrogen | J | I4 | N | 0.0626 | mg/L | 0.0626 | mg/L | | | | W | 02/21/2017 | | 1642884 | VAL | Y |

Reason Code

Description

I4

the sample result is =<5x the concentration of related analyte in the method blank.

J_LAB

The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL

NQ

The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualifier. The analyte is detected in the sample.

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-17-129317 | R-50 S1 | REG | EPA:245.2 | 0 | 1 |
| CAMO-17-129317 | R-50 S1 | REG | EPA:335.4 | 0 | 1 |
| CAMO-17-129317 | R-50 S1 | REG | EPA:351.2 | 0 | 1 |
| CAMO-17-129317 | R-50 S1 | REG | SW-846:9060 | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:120.1 | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:150.1 | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:160.1 | 0 | 1 |

DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-17-129413 | R-50 S1 | REG | EPA:245.2 | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:300.0 | 0 | 4 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:310.1 | 0 | 2 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:350.1 | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:353.2 | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | EPA:365.4 | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | SM:A2340B | 0 | 1 |
| CAMO-17-129413 | R-50 S1 | REG | SW-846:6010C | 0 | 17 |
| CAMO-17-129413 | R-50 S1 | REG | SW-846:6020 | 0 | 11 |
| CAMO-17-129413 | R-50 S1 | REG | SW-846:6850 | 0 | 1 |

March 14, 2017

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

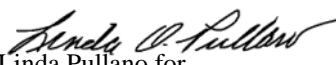
Re: LANL- WQH Water Samples
Work Order: 417150
SDG: 2017-1060

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 23, 2017, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,


Linda Pullano for
Valerie Davis
Project Manager

Chain of Custody: 2017-1060
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 417150
SDG: 2017-1060

Table of Contents

| | |
|--|----|
| Case Narrative..... | 1 |
| Chain of Custody and Supporting Documentation..... | 5 |
| Data Review Qualifier Flag Definition Sheet..... | 9 |
| Perchlorates by LCMSMS Analysis..... | 12 |
| Case Narrative..... | 13 |
| Sample Data Summary..... | 19 |
| Quality Control Summary..... | 21 |
| Quality Control Data..... | 24 |
| Metals Analysis..... | 30 |
| Case Narrative..... | 31 |
| Sample Data Summary..... | 37 |
| Quality Control Summary..... | 42 |
| General Chem Analysis..... | 56 |
| Case Narrative..... | 57 |
| Sample Data Summary..... | 88 |
| Quality Control Summary..... | 92 |
| Miscellaneous..... | 99 |

Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 417150
SDG # : 2017-1060**

March 14, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on February 23, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

| <u>Laboratory ID</u> | <u>Client ID</u> |
|-----------------------------|-------------------------|
| 417150001 | CAMO-17-129317 |
| 417150002 | CAMO-17-129413 |

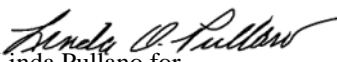
Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.


Linda Pullano for
Valerie Davis
Project Manager

List of current GEL Certifications as of 14 March 2017

| State | Certification |
|--------------------------|------------------------------|
| Alaska | UST-0110 |
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California | 2940 |
| Colorado | SC00012 |
| Connecticut | PH-0169 |
| Delaware | SC00012 |
| DoD ELAP/ ISO17025 A2LA | 2567.01 |
| Florida NELAP | E87156 |
| Foreign Soils Permit | P330-15-00283, P330-15-00253 |
| Georgia | SC00012 |
| Georgia SDWA | 967 |
| Hawaii | SC00012 |
| Idaho Chemistry | SC00012 |
| Idaho Radiochemistry | SC00012 |
| Illinois NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas NELAP | E-10332 |
| Kentucky SDWA | 90129 |
| Kentucky Wastewater | 90129 |
| Louisiana NELAP | 03046 (AI33904) |
| Louisiana SDWA | LA170010 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Michigan | 9976 |
| Mississippi | SC00012 |
| Nebraska | NE-OS-26-13 |
| Nevada | SC000122016-1 |
| New Hampshire NELAP | 205415 |
| New Jersey NELAP | SC002 |
| New Mexico | SC00012 |
| New York NELAP | 11501 |
| North Carolina | 233 |
| North Carolina SDWA | 45709 |
| North Dakota | R-158 |
| Oklahoma | 9904 |
| Pennsylvania NELAP | 68-00485 |
| S.Carolina Radchem | 10120002 |
| South Carolina Chemistry | 10120001 |
| Tennessee | TN 02934 |
| Texas NELAP | T104704235-17-12 |
| Utah NELAP | SC000122016-21 |
| Vermont | VT87156 |
| Virginia NELAP | 460202 |
| Washington | C780 |
| West Virginia | 997404 |

Chain of Custody and Supporting Documentation

SAMPLE RECEIPT & REVIEW FORM

| | | | |
|--|-----|--------------------------------------|--|
| Client: <u>ESH</u> | | SDG/AR/COC/Work Order: <u>417150</u> | |
| Received By: <u>EW</u> | | Date Received: <u>2/23/17</u> | |
| Suspected Hazard Information | Yes | No | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
| COC/Samples marked as radioactive? | | <input checked="" type="checkbox"/> | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0cpm</u> |
| Classified Radioactive II or III by RSO? | | <input checked="" type="checkbox"/> | If yes, Were swipes taken of sample containers < action levels? |
| COC/Samples marked containing PCBs? | | <input checked="" type="checkbox"/> | |
| Package, COC, and/or Samples marked as beryllium or asbestos containing? | | <input checked="" type="checkbox"/> | If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group. |
| Shipped as a DOT Hazardous? | | <input checked="" type="checkbox"/> | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | <input checked="" type="checkbox"/> | |

| Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|-------------------------------------|----|-------------------------------------|---|
| 1 Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | <input checked="" type="checkbox"/> | | | Preservation Method: Ice bags <u>Blue ice</u> Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>1 °C</u> |
| 2a Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | | | Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): |
| 3 Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | | | |
| 4 Sample containers intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 Samples requiring chemical preservation at proper pH? | <input checked="" type="checkbox"/> | | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 Do Low Level Perchlorate samples have headspace as required? | <input checked="" type="checkbox"/> | | | Sample ID's and containers affected: |
| 7 VOA vials contain acid preservation? | | | <input checked="" type="checkbox"/> | (If unknown, select No) |
| 8 VOA vials free of headspace (defined as < 6mm bubble)? | | | <input checked="" type="checkbox"/> | Sample ID's and containers affected: |
| 9 Are Encore containers present? | | | <input checked="" type="checkbox"/> | (If yes, immediately deliver to Volatiles laboratory) |
| 10 Samples received within holding time? | <input checked="" type="checkbox"/> | | | ID's and tests affected: |
| 11 Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | | | Sample ID's and containers affected: |
| 12 Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | | | Sample ID's affected: |
| 13 Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | | | Sample ID's affected: |
| 14 Are sample containers identifiable as GEL provided? | | | <input checked="" type="checkbox"/> | |
| 15 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | | | |
| 16 Carrier and tracking number. | | | | Circle Applicable: <input checked="" type="checkbox"/> FedEx Air <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5906 1781 7566</u> |

Comments (Use Continuation Form if needed):

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 22FEB17
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2916

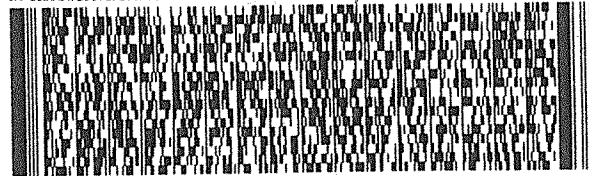
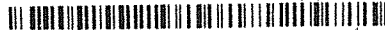
BILL SENDER

TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 6A000ASRGW04BAGWS0



FedEx
Express



538C1/338E/329E

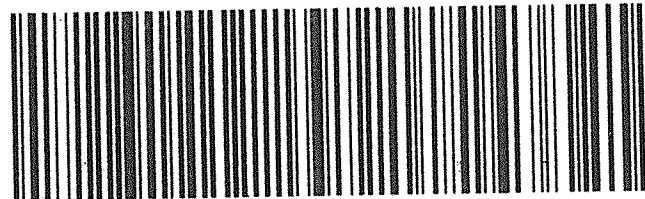
TRK# 5908 1781 7566
0201

THU - 23 FEB 10:30A
PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148V-434 RIT2 06/15 ***



RT **257**
ST **F1**

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7566
02.23

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

| Qualifier | Explanation |
|-----------|-------------|
|-----------|-------------|

| | |
|-----|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1060
Work Order #: 417150**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1644349

Prep Batch Number: 1644348

Sample Analysis

| Sample ID | Client ID |
|------------------|--|
| 417150002 | 417150002 (CAMO-17-129413) |
| 1203740088 | Interference Check Sample (ICS) |
| 1203739943 | Method Blank (MB) |
| 1203739944 | Laboratory Control Sample (LCS) |
| 1203739945 | 416958001(CAMO-17-129302) Matrix Spike (MS) |
| 1203739946 | 416958001(CAMO-17-129302) Matrix Spike Duplicate (MSD) |

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial

Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 416958001 (CAMO-17-129302) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Sample 417150002 (CAMO-17-129413) was re-analyzed to confirm potential carryover from the previous sample analysis. The re-analysis data are reported.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated

electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1060 GEL Work Order: 417150

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Michael Penny

Date: 09 MAR 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1644348Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129413Date Received: 23-FEB-17GEL Job No (SDG): 2017-1060GEL Sample ID: 417150002Date Filtered: 03-MAR-17Injection Volume (uL): 20%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.599 | ug/L | | 1 | 06-MAR-17 17:48 | per0306042a |
| | Perchlorate Isotope Ratio | | | 3.03 | | | 1 | 06-MAR-17 17:48 | per0306042a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.607 | ug/L | | 1 | 06-MAR-17 17:48 | per0306042a |
| | Perchlorate-O(18) | | | 0.490 | ug/L | | 1 | 06-MAR-17 17:48 | per0306042a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2017-1060

Extract Batch Code: 1644348

Date Filtered: 03-MAR-17

Matrix: WATER

Sample ID: 1203739944

| Analyte^ | True | Found | Units | %Rec | Q | Control Limits |
|---------------------------|-------|-------|-------|------|---|----------------|
| Perchlorate | 0.200 | .213 | ug/L | 106 | | 85 - 115 |
| Perchlorate Isotope Ratio | | 3.15 | | | | - |
| Perchlorate-101 | 0.200 | .208 | ug/L | 104 | | 85 - 115 |
| Perchlorate-O(18) | | .474 | ug/L | | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2017-1060

Extract Batch Code: 1644348

Date Extracted: 03-MAR-17

GEL MS/PS ID: 1203739945

Client ID: CAMO-17-129302

GEL MSD/PSD ID: 1203739946

QC Type: MS

| Compound^ | Spike Added | Sample Conc | Units | MS Conc | MS Rec # | MSD Conc | MSD Rec # | RPD # | RPD Limit | Recovery Limit |
|---------------------------|-------------|-------------|-------|---------|----------|----------|-----------|-------|-----------|----------------|
| Perchlorate | 0.200 | 0.331 | ug/L | 0.525 | 97 | .518 | 93 | 1 | 30 | 75 - 125 |
| Perchlorate Isotope Ratio | 0 | 2.92 | | 3.19 | | 2.92 | | 9 | | - |
| Perchlorate-101 | 0.200 | 0.348 | ug/L | 0.506 | 79 | .545 | 98 | 7 | 30 | 75 - 125 |
| Perchlorate-O(18) | 0 | 0.477 | ug/L | 0.492 | | .478 | | 3 | | - |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1644348Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 03-MAR-17GEL Job No (SDG): 2017-1060GEL Sample ID: 1203739943Date Filtered: 03-MAR-17Injection Volume (uL): 20%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.200 | ug/L | U | 1 | 06-MAR-17 14:42 | per0306017a |
| | Perchlorate Isotope Ratio | | | | | | 1 | 06-MAR-17 14:42 | per0306017a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.200 | ug/L | U | 1 | 06-MAR-17 14:42 | per0306017a |
| | Perchlorate-O(18) | | | 0.476 | ug/L | | 1 | 06-MAR-17 14:42 | per0306017a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1644348Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 03-MAR-17GEL Job No (SDG): 2017-1060GEL Sample ID: 1203739944Date Filtered: 03-MAR-17Injection Volume (uL): 20%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.213 | ug/L | | 1 | 06-MAR-17 14:50 | per0306018a |
| | Perchlorate Isotope Ratio | | | 3.15 | | | 1 | 06-MAR-17 14:50 | per0306018a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.208 | ug/L | | 1 | 06-MAR-17 14:50 | per0306018a |
| | Perchlorate-O(18) | | | 0.474 | ug/L | | 1 | 06-MAR-17 14:50 | per0306018a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1644348Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1060GEL Sample ID: 1203740088Date Filtered: 03-MAR-17Injection Volume (uL): 20

%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.213 | ug/L | | 1 | 06-MAR-17 14:57 | per0306019a |
| | Perchlorate Isotope Ratio | | | 2.99 | | | 1 | 06-MAR-17 14:57 | per0306019a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.219 | ug/L | | 1 | 06-MAR-17 14:57 | per0306019a |
| | Perchlorate-O(18) | | | 0.495 | ug/L | | 1 | 06-MAR-17 14:57 | per0306019a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1644348Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129302MSDate Received: 18-FEB-17GEL Job No (SDG): 2017-1060GEL Sample ID: 1203739945Date Filtered: 03-MAR-17Injection Volume (uL): 20%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.525 | ug/L | | 1 | 06-MAR-17 15:12 | per0306021a |
| | Perchlorate Isotope Ratio | | | 3.19 | | | 1 | 06-MAR-17 15:12 | per0306021a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.506 | ug/L | | 1 | 06-MAR-17 15:12 | per0306021a |
| | Perchlorate-O(18) | | | 0.492 | ug/L | | 1 | 06-MAR-17 15:12 | per0306021a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1644348Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129302MSDDate Received: 18-FEB-17GEL Job No (SDG): 2017-1060GEL Sample ID: 1203739946Date Filtered: 03-MAR-17Injection Volume (uL): 20%Solids:

| CAS No. | Analyte^ | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate | .05 | .2 | 0.518 | ug/L | | 1 | 06-MAR-17 15:19 | per0306022a |
| | Perchlorate Isotope Ratio | | | 2.92 | | | 1 | 06-MAR-17 15:19 | per0306022a |
| 14797-73-0 | Perchlorate-101 | .05 | .2 | 0.545 | ug/L | | 1 | 06-MAR-17 15:19 | per0306022a |
| | Perchlorate-O(18) | | | 0.478 | ug/L | | 1 | 06-MAR-17 15:19 | per0306022a |

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1060
Work Order #: 417150

| Sample ID | Client ID |
|------------------|---|
| 417150001 | CAMO-17-129317 |
| 417150002 | CAMO-17-129413 |
| 1203734213 | Method Blank (MB) ICP |
| 1203734214 | Laboratory Control Sample (LCS) |
| 1203734217 | 417152001(CAMO-17-129303L) Serial Dilution (SD) |
| 1203734215 | 417152001(CAMO-17-129303D) Sample Duplicate (DUP) |
| 1203734216 | 417152001(CAMO-17-129303S) Matrix Spike (MS) |
| 1203734208 | Method Blank (MB) ICP-MS |
| 1203734209 | Laboratory Control Sample (LCS) |
| 1203734212 | 417152001(CAMO-17-129303L) Serial Dilution (SD) |
| 1203734210 | 417152001(CAMO-17-129303D) Sample Duplicate (DUP) |
| 1203734211 | 417152001(CAMO-17-129303S) Matrix Spike (MS) |
| 1203739594 | Method Blank (MB) CVAA |
| 1203739595 | Laboratory Control Sample (LCS) |
| 1203739600 | 416958001(CAMO-17-129302L) Serial Dilution (SD) |
| 1203739596 | 416958001(CAMO-17-129302D) Sample Duplicate (DUP) |
| 1203739598 | 416958001(CAMO-17-129302S) Matrix Spike (MS) |

Sample Analysis

Samples 417150001 and 002 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

| | |
|---------------------------------------|--|
| Analytical Batch: | 1641876, 1641873, 1644167 and 1649345 |
| Prep Batch : | 1641875, 1641872 and 1644166 |
| Standard Operating Procedures: | GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10 |
| Analytical Method: | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B |
| Prep Method : | SW846 3005A and EPA 245.1/245.2 Prep |

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Hardness as CaCO₃ is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 417150002 (CAMO-17-129413)-ICP.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. However, the ICSA contained analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 417152001 (CAMO-17-129303)-ICP, ICP-MS and CVAA and 416958001 (CAMO-17-129302)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were not diluted and were prepared according to the cited SOP.

Miscellaneous Information**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

$$\text{Hardness} = 2.497 (\text{Ca}) + 4.118 (\text{Mg})$$

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1060 GEL Work Order: 417150

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Nik-Cole Elmore

Date: 22 MAR 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1060**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 417150001**BASIS:** As Received**DATE COLLECTED** 21-FEB-17**CLIENT ID:** CAMO-17-129317**LEVEL:** Low**DATE RECEIVED** 23-FEB-17**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | AXS5 | 03/06/17 12:54 | 030617W4-8 | 1644167 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1644167 | 1644166 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 03/03/17 | JXH5 |

***Analytical Methods:**

AV EPA 245.1/245.2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1060**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 417150002**BASIS:** As Received**DATE COLLECTED** 21-FEB-17**CLIENT ID:** CAMO-17-129413**LEVEL:** Low**DATE RECEIVED** 23-FEB-17**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.20 | ug/L | U | 0.067 | 0.2 | 0.2 | 1 | AV | AXS5 | 03/06/17 12:56 | 030617W4-8 | 1644167 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1060

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 417150002

BASIS: As Received

DATE COLLECTED 21-FEB-17

CLIENT ID: CAMO-17-129413

LEVEL: Low

DATE RECEIVED 23-FEB-17

MATRIX: W

%SOLIDS: 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum | 200 | ug/L | U | 68 | 200 | 200 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-36-0 | Antimony | 3 | ug/L | U | 1 | 3 | 3 | 1 | MS | SKJ | 03/15/17 11:56 | 170315-5 | 1641873 |
| 7440-38-2 | Arsenic | 5 | ug/L | U | 1.7 | 5 | 5 | 1 | MS | SKJ | 03/15/17 12:55 | 170315-6 | 1641873 |
| 7440-39-3 | Barium | 21.8 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 03/21/17 06:23 | 032117A-2 | 1641876 |
| 7440-41-7 | Beryllium | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-42-8 | Boron | 15.3 | ug/L | J | 15 | 50 | 50 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-43-9 | Cadmium | 1 | ug/L | U | 0.3 | 1 | 1 | 1 | MS | SKJ | 03/14/17 18:23 | 170314-3 | 1641873 |
| 7440-70-2 | Calcium | 16800 | ug/L | | 50 | 200 | 200 | 1 | P | HSC | 03/21/17 06:23 | 032117A-2 | 1641876 |
| 7440-47-3 | Chromium | 133 | ug/L | | 3 | 10 | 10 | 1 | MS | SKJ | 03/16/17 14:42 | 170316-4 | 1641873 |
| 7440-48-4 | Cobalt | 5 | ug/L | U | 1 | 5 | 5 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-50-8 | Copper | 10 | ug/L | U | 3 | 10 | 10 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7439-89-6 | Iron | 100 | ug/L | U | 30 | 100 | 100 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7439-92-1 | Lead | 2 | ug/L | U | 0.5 | 2 | 2 | 1 | MS | SKJ | 03/14/17 18:23 | 170314-3 | 1641873 |
| 7439-95-4 | Magnesium | 4760 | ug/L | | 110 | 300 | 300 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7439-96-5 | Manganese | 10 | ug/L | U | 2 | 10 | 10 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7439-98-7 | Molybdenum | 0.953 | ug/L | | 0.3 | 0.5 | 0.5 | 1 | MS | SKJ | 03/15/17 13:47 | 170315-7 | 1641873 |
| 7440-02-0 | Nickel | 3.7 | ug/L | | 0.5 | 2 | 2 | 1 | MS | SKJ | 03/14/17 18:23 | 170314-3 | 1641873 |
| 7440-09-7 | Potassium | 1320 | ug/L | | 50 | 150 | 150 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7782-49-2 | Selenium | 5 | ug/L | U | 2 | 5 | 5 | 1 | MS | SKJ | 03/14/17 18:23 | 170314-3 | 1641873 |
| 7631-86-9 | Silica | 69000 | ug/L | | 53 | 213 | 213 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-22-4 | Silver | 1 | ug/L | U | 0.4 | 1 | 1 | 1 | MS | SKJ | 03/14/17 18:23 | 170314-3 | 1641873 |
| 7440-23-5 | Sodium | 11700 | ug/L | | 100 | 300 | 300 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-24-6 | Strontium | 67.1 | ug/L | | 1 | 5 | 5 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-28-0 | Thallium | 0.728 | ug/L | J | 0.6 | 2 | 2 | 1 | MS | SKJ | 03/14/17 18:23 | 170314-3 | 1641873 |
| 7440-31-5 | Tin | 3.73 | ug/L | J | 2.5 | 10 | 10 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-61-1 | Uranium | 0.574 | ug/L | | 0.067 | 0.2 | 0.2 | 1 | MS | SKJ | 03/14/17 18:23 | 170314-3 | 1641873 |
| 7440-62-2 | Vanadium | 4.6 | ug/L | J | 1 | 5 | 5 | 1 | P | HSC | 03/01/17 18:40 | 030117-1 | 1641876 |
| 7440-66-6 | Zinc | 6.55 | ug/L | J | 3.3 | 10 | 10 | 1 | P | HSC | 03/21/17 06:23 | 032117A-2 | 1641876 |

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1060**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 417150002**BASIS:** As Received**DATE COLLECTED** 21-FEB-17**CLIENT ID:** CAMO-17-129413**LEVEL:** Low**DATE RECEIVED** 23-FEB-17**MATRIX:** W**%SOLIDS:** 0

| CAS No. | Analyte | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date | Analytical Run | Analytical Batch |
|---------|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
| | Hardness as CaCO3 | 61.5 | mg/L | | 0.453 | 1.24 | 1.24 | 1 | | JJ2 | 03/21/17 10:36 | | 1649345 |

Prep Information:

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1641873 | 1641872 | SW846 3005A | 50 | mL | 50 | mL | 02/23/17 | CXW4 |
| 1641876 | 1641875 | SW846 3005A | 50 | mL | 50 | mL | 02/23/17 | CXW4 |
| 1644167 | 1644166 | EPA 245.1/245.2 Prep | 20 | mL | 20 | mL | 03/03/17 | JXH5 |

***Analytical Methods:**

P SW846 3005A/6010C
MS SW846 3005A/6020A
AV EPA 245.1/245.2

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-1060

Contract: ESHL00114

Matrix: W

| <u>Sample ID</u> | <u>Analyte</u> | <u>Result</u> | <u>Units</u> | <u>Acceptance Window</u> | <u>Conc Qual</u> | <u>M*</u> | <u>MDL</u> | <u>RDL</u> |
|------------------|----------------|---------------|--------------|--------------------------|------------------|-----------|------------|------------|
| 1203734208 | Antimony | 1 | ug/L | +/-3 | U | MS | 1 | 3 |
| | Arsenic | 1.7 | ug/L | +/-5 | U | MS | 1.7 | 5 |
| | Cadmium | 0.3 | ug/L | +/-1 | U | MS | 0.3 | 1 |
| | Chromium | 3 | ug/L | +/-10 | U | MS | 3 | 10 |
| | Lead | 0.5 | ug/L | +/-2 | U | MS | 0.5 | 2 |
| | Molybdenum | 0.3 | ug/L | +/-0.5 | U | MS | 0.3 | 0.5 |
| | Nickel | 0.5 | ug/L | +/-2 | U | MS | 0.5 | 2 |
| | Selenium | 2 | ug/L | +/-5 | U | MS | 2 | 5 |
| | Silver | 0.4 | ug/L | +/-1 | U | MS | 0.4 | 1 |
| | Thallium | 0.6 | ug/L | +/-2 | U | MS | 0.6 | 2 |
| | Uranium | 0.067 | ug/L | +/-0.2 | U | MS | 0.067 | 0.2 |
| 1203734213 | Aluminum | 68 | ug/L | +/-200 | U | P | 68 | 200 |
| | Barium | 2.68 | ug/L | +/-5 | J | P | 1 | 5 |
| | Beryllium | 1 | ug/L | +/-5 | U | P | 1 | 5 |
| | Boron | 15 | ug/L | +/-50 | U | P | 15 | 50 |
| | Calcium | 50 | ug/L | +/-200 | U | P | 50 | 200 |
| | Cobalt | 1 | ug/L | +/-5 | U | P | 1 | 5 |
| | Copper | 3 | ug/L | +/-10 | U | P | 3 | 10 |
| | Iron | 30 | ug/L | +/-100 | U | P | 30 | 100 |
| | Magnesium | 110 | ug/L | +/-300 | U | P | 110 | 300 |
| | Manganese | 2 | ug/L | +/-10 | U | P | 2 | 10 |
| | Potassium | -51.5 | ug/L | +/-150 | J | P | 50 | 150 |
| | Silica | 53 | ug/L | +/-213 | U | P | 53 | 213 |
| | Sodium | 100 | ug/L | +/-300 | U | P | 100 | 300 |
| | Strontium | 1 | ug/L | +/-5 | U | P | 1 | 5 |
| | Tin | 2.5 | ug/L | +/-10 | U | P | 2.5 | 10 |
| | Vanadium | 1 | ug/L | +/-5 | U | P | 1 | 5 |
| | Zinc | 3.3 | ug/L | +/-10 | U | P | 3.3 | 10 |
| 1203739594 | Mercury | -0.069 | ug/L | +/-0.2 | J | AV | 0.067 | 0.2 |

*Analytical Methods:

P SW846 3005A/6010C
MS SW846 3005A/6020A
AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1060 Client ID CAMO-17-129303S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 417152001 Spike ID: 1203734211

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance Limit</u> | <u>Spiked Result</u> | <u>C</u> | <u>Sample Result</u> | <u>C</u> | <u>Spike Added</u> | <u>% Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Antimony | ug/L | 75-125 | 50.9 | | 1 | U | 50 | 101 | | MS |
| Arsenic | ug/L | 75-125 | 53.9 | | 1.7 | U | 50 | 105 | | MS |
| Cadmium | ug/L | 75-125 | 53.1 | | 0.3 | U | 50 | 106 | | MS |
| Chromium | ug/L | | 294 | | 217 | | 50 | 154 | N/A | MS |
| Lead | ug/L | 75-125 | 55 | | 0.5 | U | 50 | 110 | | MS |
| Molybdenum | ug/L | 75-125 | 58 | | 0.718 | | 50 | 115 | | MS |
| Nickel | ug/L | 75-125 | 53.3 | | 3.66 | | 50 | 99.4 | | MS |
| Selenium | ug/L | 75-125 | 52.9 | | 2.14 | J | 50 | 101 | | MS |
| Silver | ug/L | 75-125 | 51.8 | | 0.4 | U | 50 | 104 | | MS |
| Thallium | ug/L | 75-125 | 50.1 | | 0.6 | U | 50 | 99.5 | | MS |
| Uranium | ug/L | 75-125 | 58.1 | | 0.864 | | 50 | 114 | | MS |

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1060 Client ID CAMO-17-129303S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 417152001 Spike ID: 1203734216

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance Limit</u> | <u>Spiked Result</u> | <u>C</u> | <u>Sample Result</u> | <u>C</u> | <u>Spike Added</u> | <u>% Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Aluminum | ug/L | 75-125 | 4910 | | 68 | U | 5000 | 98.2 | | P |
| Barium | ug/L | 75-125 | 535 | | 32.9 | | 500 | 100 | | P |
| Beryllium | ug/L | 75-125 | 486 | | 1 | U | 500 | 97.2 | | P |
| Boron | ug/L | 75-125 | 516 | | 15 | U | 500 | 101 | | P |
| Calcium | ug/L | | 27500 | | 21900 | | 5000 | 113 | N/A | P |
| Cobalt | ug/L | 75-125 | 467 | | 1 | U | 500 | 93.4 | | P |
| Copper | ug/L | 75-125 | 491 | | 3 | U | 500 | 98.1 | | P |
| Iron | ug/L | 75-125 | 4800 | | 30 | U | 5000 | 95.9 | | P |
| Magnesium | ug/L | 75-125 | 10500 | | 5790 | | 5000 | 94.2 | | P |
| Manganese | ug/L | 75-125 | 471 | | 2 | U | 500 | 94.2 | | P |
| Potassium | ug/L | 75-125 | 6170 | | 1310 | | 5000 | 97.1 | | P |
| Silica | ug/L | | 72400 | | 61000 | | 10700 | 106 | N/A | P |
| Sodium | ug/L | 75-125 | 15700 | | 11000 | | 5000 | 93.5 | | P |
| Strontium | ug/L | 75-125 | 559 | | 96.7 | | 500 | 92.4 | | P |
| Tin | ug/L | 75-125 | 483 | | 2.5 | U | 500 | 96.2 | | P |
| Vanadium | ug/L | 75-125 | 491 | | 3.23 | J | 500 | 97.6 | | P |
| Zinc | ug/L | 75-125 | 486 | | 3.3 | U | 500 | 97.3 | | P |

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1060 **Client ID:** CAMO-17-129302S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 416958001 **Spike ID:** 1203739598

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance Limit</u> | <u>Spiked Result</u> | <u>C</u> | <u>Sample Result</u> | <u>C</u> | <u>Spike Added</u> | <u>% Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Mercury | ug/L | 75-125 | 1.91 | | 0.067 | U | 2 | 95.4 | | AV |

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1060

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-17-129303D

Matrix: WATER

Level: Low

Sample ID: 417152001

Duplicate ID: 1203734210

Percent Solids for Dup: N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|------------|-------|------------------|---------------|---|------------------|---|------|------|----|
| Antimony | ug/L | | 1 U | | 1 U | | | | MS |
| Arsenic | ug/L | | 1.7 U | | 1.7 U | | | | MS |
| Cadmium | ug/L | | 0.3 U | | 0.3 U | | | | MS |
| Chromium | ug/L | +/-20% | 217 | | 224 | | 3.15 | | MS |
| Lead | ug/L | | 0.5 U | | 0.5 U | | | | MS |
| Molybdenum | ug/L | +/- .5 | 0.718 | | 0.739 | | 2.88 | | MS |
| Nickel | ug/L | +/-2 | 3.66 | | 3.83 | | 4.35 | | MS |
| Selenium | ug/L | +/-5 | 2.14 J | | 2.59 J | | 19.3 | | MS |
| Silver | ug/L | | 0.4 U | | 0.4 U | | | | MS |
| Thallium | ug/L | | 0.6 U | | 0.6 U | | | | MS |
| Uranium | ug/L | +/- .2 | 0.864 | | 0.882 | | 2.06 | | MS |

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1060

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-17-129303D

Matrix: WATER

Level: Low

Sample ID: 417152001

Duplicate ID: 1203734215

Percent Solids for Dup: N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|-----------|-------|------------------|---------------|---|------------------|---|------|------|----|
| Aluminum | ug/L | | 68 U | | 68 U | | | | P |
| Barium | ug/L | +/-20% | 32.9 | | 34.7 | | 5.55 | | P |
| Beryllium | ug/L | | 1 U | | 1 U | | | | P |
| Boron | ug/L | | 15 U | | 15 U | | | | P |
| Calcium | ug/L | +/-20% | 21900 | | 22400 | | 2.48 | | P |
| Cobalt | ug/L | | 1 U | | 1 U | | | | P |
| Copper | ug/L | | 3 U | | 3 U | | | | P |
| Iron | ug/L | | 30 U | | 30 U | | | | P |
| Magnesium | ug/L | +/-20% | 5790 | | 5920 | | 2.11 | | P |
| Manganese | ug/L | | 2 U | | 2 U | | | | P |
| Potassium | ug/L | +/-20% | 1310 | | 1360 | | 3.8 | | P |
| Silica | ug/L | +/-20% | 61000 | | 63800 | | 4.36 | | P |
| Sodium | ug/L | +/-20% | 11000 | | 11300 | | 2.66 | | P |
| Strontium | ug/L | +/-20% | 96.7 | | 100 | | 3.35 | | P |
| Tin | ug/L | | 2.5 U | | 2.73 J | | 200 | | P |
| Vanadium | ug/L | +/-5 | 3.23 J | | 3.16 J | | 2.2 | | P |
| Zinc | ug/L | | 3.3 U | | 3.3 U | | | | P |

*Analytical Methods:

P SW846 3005A/6010C

Metals
–6–
Duplicate Sample Summary

SDG No.: 2017–1060**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–17–129302D**Matrix:** WATER**Level:** Low**Sample ID:** 416958001**Duplicate ID:** 1203739596**Percent Solids for Dup:** N/A

| Analyte | Units | Acceptance Limit | Sample Result | C | Duplicate Result | C | RPD | Qual | M* |
|---------|-------|---------------------|------------------|---|---------------------|---|-----|------|----|
| Mercury | ug/L | | 0.067 | U | 0.067 | U | | | AV |

*Analytical Methods:
AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1060

Contract: ESHL00114

Aqueous LCS Source:O2Si

Solid LCS Source:

| <u>Sample ID</u> | <u>Analyte</u> | <u>Units</u> | <u>True Value</u> | <u>Result</u> | <u>C</u> | <u>% Recovery</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203734209 | | | | | | | | |
| | Arsenic | ug/L | 50 | 54.6 | | 109 | 80-120 | MS |
| | Cadmium | ug/L | 50 | 52.3 | | 105 | 80-120 | MS |
| | Chromium | ug/L | 50 | 54.5 | | 109 | 80-120 | MS |
| | Lead | ug/L | 50 | 55 | | 110 | 80-120 | MS |
| | Molybdenum | ug/L | 50 | 57 | | 114 | 80-120 | MS |
| | Nickel | ug/L | 50 | 52.2 | | 104 | 80-120 | MS |
| | Selenium | ug/L | 50 | 53.7 | | 107 | 80-120 | MS |
| | Silver | ug/L | 50 | 52.5 | | 105 | 80-120 | MS |
| | Thallium | ug/L | 50 | 46.6 | | 93.3 | 80-120 | MS |
| | Uranium | ug/L | 50 | 56.1 | | 112 | 80-120 | MS |
| | Antimony | ug/L | 50 | 50.7 | | 101 | 80-120 | MS |

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1060

Contract: ESHL00114

Aqueous LCS Source:OS2I

Solid LCS Source:

| <u>Sample ID</u> | <u>Analyte</u> | <u>Units</u> | <u>True Value</u> | <u>Result</u> | <u>C</u> | <u>% Recovery</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203734214 | | | | | | | | |
| | Aluminum | ug/L | 5000 | 5050 | | 101 | 80-120 | P |
| | Barium | ug/L | 500 | 520 | | 104 | 80-120 | P |
| | Beryllium | ug/L | 500 | 490 | | 98 | 80-120 | P |
| | Boron | ug/L | 500 | 507 | | 101 | 80-120 | P |
| | Calcium | ug/L | 5000 | 4950 | | 99 | 80-120 | P |
| | Cobalt | ug/L | 500 | 485 | | 97 | 80-120 | P |
| | Copper | ug/L | 500 | 493 | | 98.7 | 80-120 | P |
| | Iron | ug/L | 5000 | 4910 | | 98.2 | 80-120 | P |
| | Magnesium | ug/L | 5000 | 4940 | | 98.8 | 80-120 | P |
| | Manganese | ug/L | 500 | 488 | | 97.5 | 80-120 | P |
| | Potassium | ug/L | 5000 | 5050 | | 101 | 80-120 | P |
| | Silica | ug/L | 10700 | 10400 | | 97 | 80-120 | P |
| | Sodium | ug/L | 5000 | 4750 | | 95 | 80-120 | P |
| | Strontium | ug/L | 500 | 476 | | 95.2 | 80-120 | P |
| | Tin | ug/L | 500 | 490 | | 97.9 | 80-120 | P |
| | Vanadium | ug/L | 500 | 493 | | 98.6 | 80-120 | P |
| | Zinc | ug/L | 500 | 502 | | 100 | 80-120 | P |

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1060

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

| <u>Sample ID</u> | <u>Analyte</u> | <u>Units</u> | <u>True Value</u> | <u>Result</u> | <u>C</u> | <u>% Recovery</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203739595 | Mercury | ug/L | 2 | 1.95 | | 97.4 | 85-115 | AV |

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1060 **Client ID:** CAMO-17-129303L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 417152001 **Serial Dilution ID:** 1203734212

| <u>Analyte</u> | <u>Initial Value ug/L</u> | <u>C</u> | <u>Serial Value ug/L</u> | <u>C</u> | <u>% Difference</u> | <u>Qual</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Antimony | 1 | U | 5 | U | | | | MS |
| Arsenic | 1.7 | U | 8.5 | U | | | | MS |
| Cadmium | .3 | U | 1.5 | U | | | | MS |
| Chromium | 217 | | 261 | | 20.152 | | | MS |
| Lead | .5 | U | 2.5 | U | | | | MS |
| Molybdenum | .718 | | 1.5 | U | 23.955 | | | MS |
| Nickel | 3.66 | | 3.84 | J | 4.696 | | | MS |
| Selenium | 2.14 | J | 10 | U | 15.77 | | | MS |
| Silver | .4 | U | 2 | U | | | | MS |
| Thallium | .6 | U | 3 | U | | | | MS |
| Uranium | .864 | | .93 | J | 7.639 | | | MS |

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1060 Client ID CAMO-17-129303L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 417152001 Serial Dilution ID: 1203734217

| <u>Analyte</u> | <u>Initial Value ug/L</u> | <u>C</u> | <u>Serial Value ug/L</u> | <u>C</u> | <u>% Difference</u> | <u>Qual</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Aluminum | 68 | U | 340 | U | | | | P |
| Barium | 32.9 | | 35.9 | | 9.431 | | | P |
| Beryllium | 1 | U | 5 | U | | | | P |
| Boron | 15 | U | 75 | U | | | | P |
| Calcium | 21900 | | 22700 | | 3.958 | | 10 | P |
| Cobalt | 1 | U | 5 | U | | | | P |
| Copper | 3 | U | 911 | | | | | P |
| Iron | 30 | U | 150 | U | | | | P |
| Magnesium | 5790 | | 5980 | | 3.164 | | 10 | P |
| Manganese | 2 | U | 10 | U | | | | P |
| Potassium | 1310 | | 1360 | | 3.453 | | | P |
| Silica | 61000 | | 60000 | | 1.735 | | 10 | P |
| Sodium | 11000 | | 11900 | | 7.977 | | 10 | P |
| Strontium | 96.7 | | 101 | | 4.324 | | 10 | P |
| Tin | 2.5 | U | 12.5 | U | | | | P |
| Vanadium | 3.23 | J | 5 | U | 5.661 | | | P |
| Zinc | 3.3 | U | 16.5 | U | | | | P |

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1060 **Client ID:** CAMO-17-129302L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 416958001 **Serial Dilution ID:** 1203739600

| <u>Analyte</u> | <u>Initial Value ug/L</u> | <u>C</u> | <u>Serial Value ug/L</u> | <u>C</u> | <u>% Difference</u> | <u>Qual</u> | <u>Acceptance Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Mercury | .067 | U | .335 | U | | | | AV |

*Analytical Methods:

AV EPA 245.1/245.2

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1060
Work Order #: 417150**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1641867

Method: SW 9060 Total Organic Carbon

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW-846:9060:

| Sample ID | Client ID |
|------------------|--|
| 417150001 | CAMO-17-129317 |
| 1203738017 | Method Blank (MB) |
| 1203738018 | Laboratory Control Sample (LCS) |
| 1203738019 | 417150001(CAMO-17-129317) Sample Duplicate (DUP) |
| 1203738023 | 417150001(CAMO-17-129317) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 14.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417150001 (CAMO-17-129317) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are

present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

| | | | |
|--------------------------|--------------------------|----------------|-----------|
| Product: | Cyanide and Total | | |
| Analytical Batch: | 1642782 | Method: | WSP-CN(T) |
| Prep Batch : | 1642781 | Method: | EPA 335.4 |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4 1993:

| Sample ID | Client ID |
|------------------|--|
| 417150001 | CAMO-17-129317 |
| 1203736325 | Method Blank (MB) |
| 1203736326 | Laboratory Control Sample (LCS) |
| 1203736328 | 417150001(CAMO-17-129317) Sample Duplicate (DUP) |
| 1203736332 | 417150001(CAMO-17-129317) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 18.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417150001 (CAMO-17-129317) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are

present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1641697 **Method:** WSP-ANIONS

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:300.0:

| Sample ID | Client ID |
|------------------|--|
| 417150002 | CAMO-17-129413 |
| 1203733882 | Method Blank (MB) |
| 1203733883 | Laboratory Control Sample (LCS) |
| 1203733884 | 417152001(CAMO-17-129303) Sample Duplicate (DUP) |
| 1203733885 | 417152001(CAMO-17-129303) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 25.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417152001 (CAMO-17-129303) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 1203733884 (CAMO-17-129303DUP) and 1203733885 (CAMO-17-129303PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations

Samples 1203733884 (CAMO-17-129303DUP), 1203733885 (CAMO-17-129303PS) and 417150002 (CAMO-17-129413) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

| | | | |
|--------------------------|-------------------------|----------------|----------------|
| Product: | Ammonia Nitrogen | | |
| Analytical Batch: | 1642884 | Method: | NH3 |
| Prep Batch : | 1642883 | Method: | EPA 350.1 Prep |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:350.1:

| Sample ID | Client ID |
|------------------|--|
| 417150002 | CAMO-17-129413 |
| 1203736533 | Method Blank (MB) |
| 1203736534 | Laboratory Control Sample (LCS) |
| 1203736535 | 417152001(CAMO-17-129303) Sample Duplicate (DUP) |
| 1203736537 | 417152001(CAMO-17-129303) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417152001 (CAMO-17-129303) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

| | | | |
|--------------------------|--------------------------------|----------------|----------------|
| Product: | Total Kjeldahl Nitrogen | | |
| Analytical Batch: | 1640306 | Method: | TKN |
| Prep Batch : | 1640305 | Method: | EPA 351.2 Prep |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:351.2:

| Sample ID | Client ID |
|------------------|--|
| 417150001 | CAMO-17-129317 |
| 1203730613 | Method Blank (MB) |
| 1203730614 | Laboratory Control Sample (LCS) |
| 1203730617 | 416868002(CAMO-17-129356) Sample Duplicate (DUP) |
| 1203730620 | 416868002(CAMO-17-129356) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 416868002 (CAMO-17-129356) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

| Analyte | Sample | Value |
|--------------------------|-------------------------------|------------------|
| Nitrogen, Total Kjeldahl | 1203730620 (CAMO-17-129356MS) | 85.6* (90%-110%) |

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The following sample 417150001 (CAMO-17-129317) in this sample group was diluted due to matrix interference. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

| | |
|--------------------------|---------------|
| Analyte | 417150 |
| | 001 |
| Nitrogen, Total Kjeldahl | 5X |

Sample Re-analysis

Sample 1203730614 (LCS) was re-analyzed due to instrument failure. The results from the reanalysis are reported. Samples were accidentally re-analyzed. 417150001 (CAMO-17-129317).

Miscellaneous Information**Data Exception (DER) Documentation**

A data exception report (DER) 1609372 was generated for samples 417150001 (CAMO-17-129317) and 1203730620 (CAMO-17-129356MS) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1642890

Method: NO3NO2

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:353.2:

| Sample ID | Client ID |
|------------------|--|
| 417150002 | CAMO-17-129413 |
| 1203736557 | Method Blank (MB) |
| 1203736558 | Laboratory Control Sample (LCS) |
| 1203736559 | 417152001(CAMO-17-129303) Sample Duplicate (DUP) |
| 1203736560 | 417150002(CAMO-17-129413) Sample Duplicate (DUP) |
| 1203736561 | 417152001(CAMO-17-129303) Post Spike (PS) |
| 1203736562 | 417150002(CAMO-17-129413) Post Spike (PS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 417150002 (CAMO-17-129413) and 417152001 (CAMO-17-129303) were selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The following samples 1203736559 (CAMO-17-129303DUP), 1203736560 (CAMO-17-129413DUP), 1203736561 (CAMO-17-129303PS), 1203736562 (CAMO-17-129413PS) and 417150002 (CAMO-17-129413) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

| | |
|---------------------------|--------|
| Analyte | 417150 |
| | 002 |
| Nitrogen, Nitrate/Nitrite | 10X |

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

| | | | |
|--------------------------|-------------------------|----------------|----------------|
| Product: | Total Phosphorus | | |
| Analytical Batch: | 1642869 | Method: | PO4 |
| Prep Batch : | 1642868 | Method: | EPA 365.4 Prep |

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4 1974:

| | |
|------------------|--|
| Sample ID | Client ID |
| 417150002 | CAMO-17-129413 |
| 1203736513 | Method Blank (MB) |
| 1203736514 | Laboratory Control Sample (LCS) |
| 1203736515 | 417152001(CAMO-17-129303) Sample Duplicate (DUP) |
| 1203736516 | 417152001(CAMO-17-129303) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417152001 (CAMO-17-129303) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are

present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1642893

Method: TDS

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:160.1:

| Sample ID | Client ID |
|------------------|--|
| 417150002 | CAMO-17-129413 |
| 1203736563 | Method Blank (MB) |
| 1203736564 | Laboratory Control Sample (LCS) |
| 1203736565 | 417152001(CAMO-17-129303) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 417152001 (CAMO-17-129303) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

| Analyte | Sample | Value |
|------------------------|--------------------------------|---------------|
| Total Dissolved Solids | 1203736565 (CAMO-17-129303DUP) | 5.18* (0%-5%) |

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1610674 was generated for sample 1203736565 (CAMO-17-129303DUP) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

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Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1642194

Method: EPA120.1 Specific Conductivity

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:120.1:

| Sample ID | Client ID |
|------------------|--|
| 417150002 | CAMO-17-129413 |
| 1203734867 | Laboratory Control Sample (LCS) |
| 1203734868 | 417066001(CAMO-17-129298) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 13.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417066001 (CAMO-17-129298) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: pH

Analytical Batch: 1642723 **Method:** PH

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1 1982:

| Sample ID | Client ID |
|------------------|--|
| 417150002 | CAMO-17-129413 |
| 1203736201 | Laboratory Control Sample (LCS) |
| 1203736202 | 417305009(CASA-17-130020) Sample Duplicate (DUP) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 22.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a Thermo Orion Star A111. Immediates

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417305009 (CASA-17-130020) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

| Sample | Analyte | Value |
|--------------------------------|---------|--|
| 1203736202 (CASA-17-130020DUP) | pH | Received 24-FEB-17, out of holding 22-FEB-17 |
| 417150002 (CAMO-17-129413) | pH | Received 23-FEB-17, out of holding 21-FEB-17 |

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1614308 was generated for samples 417150002 (CAMO-17-129413) and 1203736202 (CASA-17-130020DUP) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1642724 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:310.1:

| Sample ID | Client ID |
|------------------|--|
| 417150002 | CAMO-17-129413 |
| 1203736203 | Laboratory Control Sample (LCS) |
| 1203736204 | 417305009(CASA-17-130020) Sample Duplicate (DUP) |
| 1203736205 | 417305009(CASA-17-130020) Matrix Spike (MS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 13.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 417305009 (CASA-17-130020) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1060 GEL Work Order: 417150

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Kristen Mizzell

Date: 21 MAR 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 21, 2017

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1060

Client Sample ID: CAMO-17-129317

Project: ESHL00114

Sample ID: 417150001

Client ID: ARSL004

Matrix: W

Collect Date: 21-FEB-17 12:20

Receive Date: 23-FEB-17

Collector: Client

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|-------|------|----|---------|----------|------|---------|--------|
| Carbon Analysis | | | | | | | | | | | | |
| SW 9060 Total Organic Carbon "As Received" | | | | | | | | | | | | |
| Total Organic Carbon Average | J | 0.406 | 0.330 | 1.00 | mg/L | | 1 | TSM | 03/10/17 | 0031 | 1641867 | 1 |
| Flow Injection Analysis | | | | | | | | | | | | |
| WSP-CN(T) "As Received" | | | | | | | | | | | | |
| Cyanide, Total | U | ND | 1.67 | 5.00 | ug/L | 1.00 | 1 | AXH3 | 02/27/17 | 1331 | 1642782 | 2 |
| Nutrient Analysis | | | | | | | | | | | | |
| TKN "As Received" | | | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | U | ND | 0.165 | 0.500 | mg/L | 1.00 | 5 | KLP1 | 03/02/17 | 1032 | 1640306 | 3 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 335.4 | EPA 335.4 Total Cyanide | AXH3 | 02/27/17 | 1100 | 1642781 |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1 | 03/01/17 | 1500 | 1640305 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|----------------|------------------|
| 1 | SW-846:9060 | |
| 2 | EPA 335.4 1993 | |
| 3 | EPA:351.2 | |

Notes:

Column headers are defined as follows:

| | |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor | Lc/LC: Critical Level |
| DL: Detection Limit | PF: Prep Factor |
| MDA: Minimum Detectable Activity | RL: Reporting Limit |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

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Certificate of Analysis

Report Date: March 21, 2017

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1060

Client Sample ID: CAMO-17-129413
Sample ID: 417150002
Matrix: W
Collect Date: 21-FEB-17 12:20
Receive Date: 23-FEB-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------|-------|----------|------|----|---------|----------|------|---------|--------|
| Ion Chromatography | | | | | | | | | | | | |
| WSP-ANIONS "As Received" | | | | | | | | | | | | |
| Bromide | J | 0.0819 | 0.067 | 0.200 | mg/L | | 1 | MXL2 | 02/24/17 | 1342 | 1641697 | 1 |
| Chloride | | 8.64 | 0.067 | 0.200 | mg/L | | 1 | | | | | |
| Fluoride | | 0.262 | 0.033 | 0.100 | mg/L | | 1 | | | | | |
| Sulfate | | 12.0 | 0.133 | 0.400 | mg/L | | 1 | | | | | |
| Nutrient Analysis | | | | | | | | | | | | |
| NH3 "As Received" | | | | | | | | | | | | |
| Nitrogen, Ammonia | | 0.0626 | 0.017 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 03/01/17 | 1333 | 1642884 | 2 |
| NO3NO2 "As Received" | | | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | 2.05 | 0.170 | 0.500 | mg/L | | 10 | KLP1 | 02/27/17 | 1421 | 1642890 | 3 |
| PO4 "As Received" | | | | | | | | | | | | |
| Phosphorus, Total as P | | 0.133 | 0.020 | 0.050 | mg/L | 1.00 | 1 | KLP1 | 02/28/17 | 1402 | 1642869 | 4 |
| Solids Analysis | | | | | | | | | | | | |
| TDS "As Received" | | | | | | | | | | | | |
| Total Dissolved Solids | | 126 | 3.40 | 14.3 | mg/L | | | KLP1 | 02/28/17 | 1206 | 1642893 | 5 |
| Titration and Ion Analysis | | | | | | | | | | | | |
| EPA 310.1 Total Alkalinity "As Received" | | | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 62.0 | 1.45 | 4.00 | mg/L | | | RXB5 | 03/03/17 | 1505 | 1642724 | 6 |
| Carbonate alkalinity (CaCO3) | U | ND | 1.45 | 4.00 | mg/L | | | | | | | |
| EPA120.1 Specific Conductivity "As Received" | | | | | | | | | | | | |
| Conductivity | | 184 | 1.00 | 1.00 | umhos/cm | | 1 | VH1 | 02/24/17 | 1409 | 1642194 | 7 |
| PH "As Received" | | | | | | | | | | | | |
| pH at Temp 16.6C | H | 8.00 | 0.010 | 0.100 | SU | | 1 | RXB5 | 03/03/17 | 1505 | 1642723 | 8 |

The following Prep Methods were performed:

| Method | Description | Analyst | Date | Time | Prep Batch |
|----------------|--|---------|----------|------|------------|
| EPA 350.1 Prep | EPA 350.1 Ammonia Nitrogen Prep | AXH3 | 02/28/17 | 1430 | 1642883 |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1 | 02/27/17 | 1900 | 1642868 |

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Certificate of Analysis

Report Date: March 21, 2017

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1060

Client Sample ID: CAMO-17-129413
Sample ID: 417150002

Project: ESHL00114
Client ID: ARSL004

| Parameter | Qualifier | Result | DL | RL | Units | PF | DF | Analyst | Date | Time | Batch | Method |
|--|----------------|--------|------------------|----|-------|----|----|---------|------|------|-------|--------|
| The following Analytical Methods were performed: | | | | | | | | | | | | |
| Method | Description | | Analyst Comments | | | | | | | | | |
| 1 | EPA:300.0 | | | | | | | | | | | |
| 2 | EPA:350.1 | | | | | | | | | | | |
| 3 | EPA:353.2 | | | | | | | | | | | |
| 4 | EPA 365.4 1974 | | | | | | | | | | | |
| 5 | EPA:160.1 | | | | | | | | | | | |
| 6 | EPA:310.1 | | | | | | | | | | | |
| 7 | EPA:120.1 | | | | | | | | | | | |
| 8 | EPA 150.1 1982 | | | | | | | | | | | |

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

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QC Summary

Report Date: March 21, 2017

Page 1 of 6

Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 417150

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------------|-----------|--------|-------|----|-------|------|--------|----------------|-------|----------|-------|
| Carbon Analysis | | | | | | | | | | | |
| Batch | 1641867 | | | | | | | | | | |
| QC1203738019 | 417150001 | DUP | | | | | | | | | |
| Total Organic Carbon Average | | J | 0.406 | J | 0.330 | mg/L | 20.7 ^ | (+/-1.00) | TSM | 03/10/17 | 01:17 |
| QC1203738018 | LCS | | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | | | | 10.6 | mg/L | | 106 (80%-120%) | | 03/10/17 | 03:28 |
| QC1203738017 | MB | | | | | | | | | | |
| Total Organic Carbon Average | | | U | ND | mg/L | | | | | 03/10/17 | 03:14 |
| QC1203738023 | 417150001 | PS | | | | | | | | | |
| Total Organic Carbon Average | 10.0 | J | 0.406 | | 10.9 | mg/L | | 105 (75%-125%) | | 03/10/17 | 02:04 |
| Flow Injection Analysis | | | | | | | | | | | |
| Batch | 1642782 | | | | | | | | | | |
| QC1203736328 | 417150001 | DUP | | | | | | | | | |
| Cyanide, Total | | U | ND | U | ND | ug/L | N/A | | AXH3 | 02/27/17 | 13:32 |
| QC1203736326 | LCS | | | | | | | | | | |
| Cyanide, Total | 50.0 | | | | 50.4 | ug/L | | 101 (90%-110%) | | 02/27/17 | 13:30 |
| QC1203736325 | MB | | | | | | | | | | |
| Cyanide, Total | | | U | ND | ug/L | | | | | 02/27/17 | 13:29 |
| QC1203736332 | 417150001 | MS | | | | | | | | | |
| Cyanide, Total | 100 | U | ND | | 102 | ug/L | | 102 (90%-110%) | | 02/27/17 | 13:33 |
| Ion Chromatography | | | | | | | | | | | |
| Batch | 1641697 | | | | | | | | | | |
| QC1203733884 | 417152001 | DUP | | | | | | | | | |
| Bromide | | J | 0.121 | J | 0.113 | mg/L | 7.1 ^ | (+/-0.200) | MXL2 | 02/24/17 | 14:41 |

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QC Summary

Workorder: 417150

Page 2 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------|---------|--------|-------|-------|-------|-------|------|------------|-------|----------|-------|
| Ion Chromatography | | | | | | | | | | | |
| Batch | 1641697 | | | | | | | | | | |
| Chloride | | 11.2 | | 11.3 | mg/L | 0.221 | | (0%-20%) | MXL2 | 02/24/17 | 17:08 |
| Fluoride | | 0.150 | | 0.147 | mg/L | 2.15 | ^ | (+/-0.100) | | 02/24/17 | 14:41 |
| Sulfate | | 20.1 | | 20.1 | mg/L | 0.277 | | (0%-20%) | | 02/24/17 | 17:08 |
| QC1203733883 LCS | | | | | | | | | | | |
| Bromide | 1.25 | | | 1.19 | mg/L | | 95.4 | (80%-120%) | | 02/24/17 | 10:08 |
| Chloride | 5.00 | | | 4.64 | mg/L | | 92.8 | (80%-120%) | | | |
| Fluoride | 2.50 | | | 2.45 | mg/L | | 97.9 | (80%-120%) | | | |
| Sulfate | 10.0 | | | 9.64 | mg/L | | 96.4 | (80%-120%) | | | |
| QC1203733882 MB | | | | | | | | | | | |
| Bromide | | | U | ND | mg/L | | | | | 02/24/17 | 09:39 |
| Chloride | | | U | ND | mg/L | | | | | | |
| Fluoride | | | U | ND | mg/L | | | | | | |
| Sulfate | | | U | ND | mg/L | | | | | | |
| QC1203733885 417152001 PS | | | | | | | | | | | |
| Bromide | 1.25 | J | 0.121 | 1.29 | mg/L | | 93.1 | (75%-125%) | | 02/24/17 | 15:10 |
| Chloride | 5.00 | | 5.62 | 11.0 | mg/L | | 108 | (75%-125%) | | 02/24/17 | 17:37 |
| Fluoride | 2.50 | | 0.150 | 2.41 | mg/L | | 90.5 | (75%-125%) | | 02/24/17 | 15:10 |
| Sulfate | 10.0 | | 10.1 | 20.3 | mg/L | | 102 | (75%-125%) | | 02/24/17 | 17:37 |

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QC Summary

Workorder: 417150

Page 3 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------|-----------|--------|-------|----|--------|------|--------|------------|-------|----------|-------|
| Nutrient Analysis | | | | | | | | | | | |
| Batch | 1640306 | | | | | | | | | | |
| QC1203730617 | 416868002 | DUP | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | U | ND | U | ND | mg/L | N/A | | KLP1 | 03/02/17 | 10:18 |
| QC1203730614 | LCS | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | | | | 1.03 | mg/L | 103 | (90%-110%) | | 03/02/17 | 10:05 |
| QC1203730613 | MB | | | | | | | | | | |
| Nitrogen, Total Kjeldahl | | | U | | ND | mg/L | | | | 03/02/17 | 09:52 |
| QC1203730620 | 416868002 | MS | | | | | | | | | |
| Nitrogen, Total Kjeldahl | 1.00 | U | ND | | 0.856 | mg/L | 85.6* | (90%-110%) | | 03/02/17 | 10:19 |
| Batch | 1642869 | | | | | | | | | | |
| QC1203736515 | 417152001 | DUP | | | | | | | | | |
| Phosphorus, Total as P | | | 0.138 | | 0.147 | mg/L | 6.32 ^ | (+/-0.050) | KLP1 | 02/28/17 | 14:04 |
| QC1203736514 | LCS | | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | | | 0.983 | mg/L | 98.3 | (80%-124%) | | 02/28/17 | 13:56 |
| QC1203736513 | MB | | | | | | | | | | |
| Phosphorus, Total as P | | | U | | ND | mg/L | | | | 02/28/17 | 13:56 |
| QC1203736516 | 417152001 | MS | | | | | | | | | |
| Phosphorus, Total as P | 1.00 | | 0.138 | | 1.31 | mg/L | 117 | (63%-139%) | | 02/28/17 | 14:04 |
| Batch | 1642884 | | | | | | | | | | |
| QC1203736535 | 417152001 | DUP | | | | | | | | | |
| Nitrogen, Ammonia | | U | ND | U | ND | mg/L | N/A | | KLP1 | 03/01/17 | 13:39 |
| QC1203736534 | LCS | | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | | | | 0.994 | mg/L | 99.4 | (90%-110%) | | 03/01/17 | 13:32 |
| QC1203736533 | MB | | | | | | | | | | |
| Nitrogen, Ammonia | | | J | | 0.0175 | mg/L | | | | 03/01/17 | 13:32 |

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QC Summary

Workorder: 417150

Page 4 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------|-----------|--------|-------|-------|-------|--------|------|------------|-------|----------|-------|
| Nutrient Analysis | | | | | | | | | | | |
| Batch | 1642884 | | | | | | | | | | |
| QC1203736537 | 417152001 | MS | | | | | | | | | |
| Nitrogen, Ammonia | 1.00 | U | ND | 1.07 | mg/L | | 106 | (90%-110%) | KLP1 | 03/01/17 | 13:40 |
| | | | | | | | | | | | |
| Batch | 1642890 | | | | | | | | | | |
| QC1203736559 | 417152001 | DUP | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 1.64 | 1.50 | mg/L | 8.61 | | (0%-20%) | KLP1 | 02/27/17 | 14:26 |
| | | | | | | | | | | | |
| QC1203736560 | 417150002 | DUP | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | 2.05 | 1.89 | mg/L | 8.12 ^ | | (+/-0.500) | | 02/27/17 | 14:23 |
| | | | | | | | | | | | |
| QC1203736558 | LCS | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | | 0.940 | mg/L | | 94 | (90%-110%) | | 02/27/17 | 14:20 |
| | | | | | | | | | | | |
| QC1203736557 | MB | | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | | | U | ND | mg/L | | | | | 02/27/17 | 14:19 |
| | | | | | | | | | | | |
| QC1203736561 | 417152001 | PS | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.327 | 1.28 | mg/L | | 95.3 | (90%-110%) | | 02/27/17 | 14:27 |
| | | | | | | | | | | | |
| QC1203736562 | 417150002 | PS | | | | | | | | | |
| Nitrogen, Nitrate/Nitrite | 1.00 | | 0.205 | 1.23 | mg/L | | 103 | (90%-110%) | | 02/27/17 | 14:24 |
| | | | | | | | | | | | |
| Solids Analysis | | | | | | | | | | | |
| Batch | 1642893 | | | | | | | | | | |
| QC1203736565 | 417152001 | DUP | | | | | | | | | |
| Total Dissolved Solids | | | 144 | 134 | mg/L | 5.18* | | (0%-5%) | KLP1 | 02/28/17 | 12:06 |
| | | | | | | | | | | | |
| QC1203736564 | LCS | | | | | | | | | | |
| Total Dissolved Solids | 300 | | | 289 | mg/L | | 96.2 | (95%-105%) | | 02/28/17 | 12:06 |
| | | | | | | | | | | | |
| QC1203736563 | MB | | | | | | | | | | |
| Total Dissolved Solids | | | U | ND | mg/L | | | | | 02/28/17 | 12:06 |

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QC Summary

Workorder: 417150

Page 5 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------------------|-----------|--------|------|------|----------|-------|------|------------|-------|----------|-------|
| Titration and Ion Analysis | | | | | | | | | | | |
| Batch | 1642194 | | | | | | | | | | |
| QC1203734868 | 417066001 | DUP | | | | | | | | | |
| Conductivity | | 190 | | 190 | umhos/cm | 0.105 | | (0%-10%) | VH1 | 02/24/17 | 14:08 |
| QC1203734867 | LCS | | | | | | | | | | |
| Conductivity | 1410 | | | 1390 | umhos/cm | | 98.2 | (95%-105%) | | 02/24/17 | 14:06 |
| Batch | 1642723 | | | | | | | | | | |
| QC1203736202 | 417305009 | DUP | | | | | | | | | |
| pH | H | 8.53 | H | 8.52 | SU | 0.117 | | (0%-5%) | RXB5 | 03/03/17 | 14:18 |
| QC1203736201 | LCS | | | | | | | | | | |
| pH | 7.00 | | | 6.97 | SU | | 99.6 | (99%-101%) | | 03/03/17 | 13:51 |
| Batch | 1642724 | | | | | | | | | | |
| QC1203736204 | 417305009 | DUP | | | | | | | | | |
| Alkalinity, Total as CaCO3 | | 122 | | 121 | mg/L | 0.823 | | (0%-20%) | RXB5 | 03/03/17 | 14:17 |
| Carbonate alkalinity (CaCO3) | | 6.00 | | 6.00 | mg/L | 0 ^ | | (0%-20%) | | | |
| QC1203736203 | LCS | | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 100 | | | 109 | mg/L | | 109 | (90%-110%) | | 03/03/17 | 13:51 |
| QC1203736205 | 417305009 | MS | | | | | | | | | |
| Alkalinity, Total as CaCO3 | 100 | 122 | | 228 | mg/L | | 106 | (80%-120%) | | 03/03/17 | 14:21 |

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative

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QC Summary

Workorder: 417150

Page 6 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|---|--------|------|----|-------|------|------|-------|-------|------|------|
| ND | Analyte concentration is not detected above the detection limit | | | | | | | | | | |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. | | | | | | | | | | |
| R | Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes. | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD. | | | | | | | | | | |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Z | Paint Filter Test--Particulates passed through the filter, however no free liquids were observed. | | | | | | | | | | |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| d | 5-day BOD--The 2:1 depletion requirement was not met for this sample | | | | | | | | | | |
| e | 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes | | | | | | | | | | |
| h | Preparation or preservation holding time was exceeded | | | | | | | | | | |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

DATA EXCEPTION REPORT

| | | | |
|--|--|--|--|
| Mo.Day Yr. 02-MAR-17 | Division: Industrial | Quality Criteria: Specifications | Type: Process |
| Instrument Type: LACHAT Flow Injection Analyzer | Test / Method: EPA 351.2, EPA 351.2 SC | Matrix Type: Liquid | Client Code: BEAL, BETT, CCUV, ESHL, |
| Batch ID: 1640306 | Sample Numbers: See Below | | |
| <p>Potentially affected work order(s)(SDG): 416677(BEA01-323-03),416709,416786(LMP17026013A_WCH),416793,416868(2017-1029),416958(2017-1050),417066(2017-1054),417150(2017-1060),417152(2017-1058),417305(2017-1078)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/MSD, or PS/PSD Container scanning event for custody missed Failed RPD for DUP</p> | | | |
| Specification and Requirements Exception Description: | | DER Disposition: | |
| <p>1. Container scanning event for custody missed:</p> <p>416677 003,009</p> <p>416709 003,007,011</p> <p>416786 002,006,009</p> <p>416793 001,002,003,004,005</p> <p>416868 002</p> <p>416958 002,004</p> <p>417066 002</p> <p>417150 001</p> <p>417152 002</p> <p>417305 007</p> <p>2. Failed RPD for DUP:</p> <p>QC 1203730615DUP</p> <p>3. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203730618MS,</p> <p>1203730619MS,</p> <p>1203730620MS</p> | | <p>1. Scanning was accidentally missed by analyst. Samples were in custody at time of analysis.</p> <p>2. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Nitrogen, Total Kjeldahl 1203730615 (BEA01-323-09DUP) [abs(.25 - .407)* (+/-1 mg/L)].</p> <p>3. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity. Nitrogen, Total Kjeldahl 1203730618 (BEA01-323-09MS) [72.3* (90%-110%)], 1203730619 (LMP17026019AMS) [120* (90%-110%)] and 1203730620 (CAMO-17-129356MS) [85.6* (90%-110%)].</p> | |

Originator's Name:

Kristen Mizzell 02-MAR-17

Data Validator/Group Leader:

Aubrey Kingsbury 02-MAR-17

DATA EXCEPTION REPORT

| | | | |
|--|--|---|---|
| Mo.Day Yr. 07-MAR-17 | Division: Industrial | Quality Criteria: Specifications | Type: Process |
| Instrument Type: BALANCE ANALYTICAL | Test / Method: EPA 160.1, SM 2540C | Matrix Type: Liquid | Client Code: ESHL, TALN, WSRB |
| Batch ID: 1642893 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG): 417150(2017-1060),417152(2017-1058),417210,417412 Application Issues: Failed RPD for DUP Other | | | |
| Specification and Requirements Exception Description: | | DER Disposition: | |
| 1. Failed RPD for DUP: QC 1203736565DUP 2. Other: 417412 001 | | 1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Total Dissolved Solids 1203736565 (CAMO-17-129303DUP) [5.18* (0%-5%)]. 2. In order to meet consecutive weight check criteria, weight events must be within 0.0005g of each other. After initial weight checks failed this criteria. The sample matrix is caustic soda that would not completely dry. The sample absorbed moisture from the air as soon as it was removed from the dessicator resulting in the failed weight checks. | |

Originator's Name:

Kristen Mizzell 07-MAR-17

Data Validator/Group Leader:

Aubrey Kingsbury 07-MAR-17

| DATA EXCEPTION REPORT | | | |
|---|---|---|-----------------------------|
| Mo.Day Yr. 16-MAR-17 | Division: Industrial | Quality Criteria: Specifications | Type: Process |
| Instrument Type: ELECTRODE | Test / Method: EPA 150.1, SM 4500-H B | Matrix Type: Liquid | Client Code: ESHL |
| Batch ID: 1642723 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG): 417066(2017-1054),417150(2017-1060),417152(2017-1058),417305(2017-1078) Application Issues: Sample received out of holding | | | |
| Specification and Requirements | | DER Disposition: | |
| Exception Description: | | | |
| 1. Sample received out of holding: 417066 001 417150 002 417152 001 417305 002,004,005,007,009 QC 1203736202DUP | | 1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203736202 (CASA-17-130020DUP) [Received 24-FEB-17, out of holding 22-FEB-17]. 417066001 (CAMO-17-129298) [Received 22-FEB-17, out of holding 17-FEB-17]. 417150002 (CAMO-17-129413) [Received 23-FEB-17, out of holding 21-FEB-17]. 417152001 (CAMO-17-129303) [Received 23-FEB-17, out of holding 21-FEB-17]. 417305002 (CASA-17-130018) [Received 24-FEB-17, out of holding 22-FEB-17]. 417305004 (CASA-17-130019) [Received 24-FEB-17, out of holding 22-FEB-17]. 417305005 (CASA-17-130022) [Received 24-FEB-17, out of holding 22-FEB-17]. 417305007 (CASA-17-130025) [Received 24-FEB-17, out of holding 22-FEB-17]. 417305009 (CASA-17-130020) [Received 24-FEB-17, out of holding 22-FEB-17]. | |

Originator's Name:

Rachael Bell 16-MAR-17

Data Validator/Group Leader:

Elzbieta Szulc 17-MAR-17