

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:

Data for Field Sample CAMO-18-147681 begins on page 152.



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147640

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED         |
|---------------------------------|---------------|--------------|----------------------|---------------|----------------------|
| Date Collected<br>(MM/DD/YYYY): | 10/31/17      | OK           | FIELD MATRIX:        | WG            | OK                   |
| TIME COLLECTED<br>(HH:MM):      | 1105          |              | MEDIA:               | OK            |                      |
| PRS ID:                         | OK            |              | SAMPLE TECH<br>CODE: | GSP           |                      |
| LOCATION ID:                    | R-45 S1       |              | FIELD PREP:          | F             |                      |
| LOCATION TYPE:                  | OK            |              | FIELD QC TYPE:       | REG           |                      |
| TOP DEPTH:                      | ↓             |              | SAMPLE USAGE:        | INV           | ↓                    |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |               | YES / NO / <u>NA</u> |

| PRIORITY | ORDER                            | CONTAINER             | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------------------------|-----------------------|---|--------------|---------------|----------------------|
| NA       | WSP-All Metals                   | 1 LITER POLY          | 1 | HNO3 ICE     | Y             | NA                   |
| ↓        | WSP-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          | ↓             | ↓                    |
| ↓        | WSP-<br>NH3+NO3/NO2+PO4          | 500 ML AMBER<br>GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM \_\_\_\_\_ Dissolved Oxygen \_\_\_\_\_ Flow (in gpm) \_\_\_\_\_  
 Oxidation-Reduction \_\_\_\_\_ pH \_\_\_\_\_ Specific \_\_\_\_\_  
 Potential \_\_\_\_\_ Conductance \_\_\_\_\_  
 Temperature \_\_\_\_\_ Turbidity \_\_\_\_\_

COLLECTED BY (PRINT): T. Bonham, D. Jaramillo

|                                                                                           |                               |                                                                            |                               |
|-------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name) <u>Allyn Stanford</u><br>(Signature) <u>[Signature]</u> | Date/Time<br>10/31/17<br>1345 | RECEIVED BY MATT ENGLERT<br>(Printed Name)<br>(Signature) <u>M-Englert</u> | Date/Time<br>10-31-17<br>1345 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                          | Date/Time                     | RECEIVED BY<br>(Printed Name)<br>(Signature)                               | Date/Time                     |

Report Date: 10/05/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147641

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED    |
|---------------------------------|---------------|--------------|----------------------|---------------|-----------------|
| Date Collected<br>(MM/DD/YYYY): | 10/31/17      | OK           | FIELD MATRIX:        | WG            | OK              |
| TIME COLLECTED<br>(HH:MM):      | 1256          |              | MEDIA:               | OK            |                 |
| PRS ID:                         | OK            |              | SAMPLE TECH<br>CODE: | GSP           |                 |
| LOCATION ID:                    | R-45 S2       |              | FIELD PREP:          | F             |                 |
| LOCATION TYPE:                  | OK            |              | FIELD QC TYPE:       | REG           |                 |
| TOP DEPTH:                      | ↓             |              | SAMPLE USAGE:        | 10/31/17      | Test            |
| 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-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          | ↓             | ↓                    |
| ↓        | WSP-<br>NH3+NO3/NO2+PO4          | 500 ML AMBER<br>GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM Dissolved Oxygen \_\_\_\_\_ Flow (m<sup>3</sup>/min) \_\_\_\_\_  
 Oxidation-Reduction \_\_\_\_\_ pH \_\_\_\_\_ Specific \_\_\_\_\_  
 Potential \_\_\_\_\_ Conductance \_\_\_\_\_  
 Temperature \_\_\_\_\_ Turbidity \_\_\_\_\_

COLLECTED BY (PRINT): T. Bonham, D. Jaramillo

|                                                                                              |                               |                                                                              |                               |
|----------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name) <i>Allyson Stanfield</i><br>(Signature) <i>[Signature]</i> | Date/Time<br>10/31/17<br>1345 | RECEIVED BY <i>MAT ENGUET</i><br>(Printed Name) <i>M-Engu</i><br>(Signature) | Date/Time<br>10-31-17<br>1345 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                             | Date/Time                     | RECEIVED BY<br>(Printed Name)<br>(Signature)                                 | Date/Time                     |

Report Date: 10/05/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147647

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|---------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 10-31-2017    | OK           | FIELD MATRIX:        | WG            | OK            |
| TIME COLLECTED<br>(HH:MM):      | 14:52         |              | MEDIA:               | OK            |               |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | GSP           |               |
| LOCATION ID:                    | R-61 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-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          |               |                      |
|          | WSP-<br>NH3+NO3/NO2+PO4          | 500 ML AMBER<br>GLASS | 1 | H2SO4        |               |                      |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM Dissolved Oxygen DATA  
 Oxidation-Reduction Potential \_\_\_\_\_ pH \_\_\_\_\_  
 Temperature \_\_\_\_\_ Turbidity \_\_\_\_\_

Flow (in gpm) \_\_\_\_\_  
Specific Conductance \_\_\_\_\_

COLLECTED BY (PRINT): A.V. 10/31

|                                                                                         |                                  |                                                                                      |                               |
|-----------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name) <u>Damon Hughes</u><br>(Signature) <u>[Signature]</u> | Date/Time<br>10-31-2017<br>15:45 | RECEIVED BY<br>(Printed Name) <u>Lance Onstott</u><br>(Signature) <u>[Signature]</u> | Date/Time<br>10/31/17<br>1545 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                        | Date/Time                        | RECEIVED BY<br>(Printed Name)<br>(Signature)                                         | Date/Time                     |

Report Date: 10/05/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147655

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED              | AS COLLECTED  |
|---------------------------------|---------------|--------------|----------------------|----------------------------|---------------|
| Date Collected<br>(MM/DD/YYYY): | 10/31/17      | OK           | FIELD MATRIX:        | WG                         | OK            |
| TIME COLLECTED<br>(HH:MM):      | 1105          |              | MEDIA:               | W                          |               |
| PRS ID:                         | OK            |              | SAMPLE TECH<br>CODE: | GSP <del>OK</del> 10/31/17 |               |
| LOCATION ID:                    | R-45 S1       |              | FIELD PREP:          | UF                         |               |
| LOCATION TYPE:                  | OK            |              | FIELD QC TYPE:       | REG                        | ✓             |
| TOP DEPTH:                      | ↓             | ↓            | SAMPLE USAGE:        | INV                        | Yes 10/31/17  |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |                            | YES / NO (NA) |

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

SAMPLE COMMENTS: Sampled about 35 ft. from running diesel generator

LOCATION COMMENTS: Breezy while sampling

## FIELD PARAMETERS:

|                               |       |       |                  |      |                      |       |
|-------------------------------|-------|-------|------------------|------|----------------------|-------|
| Sample Time                   | 1105  | HH:MM | Dissolved Oxygen | 6.97 | Flow (in gpm)        | 3.52  |
| Oxidation-Reduction Potential | 230.7 |       | pH               | 7.64 | Specific Conductance | 192.4 |
| Temperature                   | 20.1  |       | Turbidity        | 0.29 |                      |       |

COLLECTED BY (PRINT): T. Bonham, D. Jaramillo

|                                                                                       |                               |                                                                                                 |                               |
|---------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name) Allison Stanfield<br>(Signature) <i>[Signature]</i> | Date/Time<br>10/31/17<br>1345 | RECEIVED BY MATT ENGLERT<br>(Printed Name) <i>[Signature]</i><br>(Signature) <i>[Signature]</i> | Date/Time<br>10-31-17<br>1345 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                      | Date/Time                     | RECEIVED BY<br>(Printed Name)<br>(Signature)                                                    | Date/Time                     |

Report Date: 10/05/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147656

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED    |
|---------------------------------|---------------|--------------|----------------------|---------------|-----------------|
| Date Collected<br>(MM/DD/YYYY): | 10/31/17      | OK           | FIELD MATRIX:        | WG            | OK              |
| TIME COLLECTED<br>(HH:MM):      | 1256          |              | MEDIA:               | W             |                 |
| PRS ID:                         | OK            |              | SAMPLE TECH<br>CODE: | GSP           |                 |
| LOCATION ID:                    | R-45 S2       |              | FIELD PREP:          | UF            |                 |
| LOCATION TYPE:                  | OK            |              | FIELD QC TYPE:       | REG           | ↓               |
| TOP DEPTH:                      | ↓             |              | SAMPLE USAGE:        | INT 10/31/17  | Test            |
| BOTTOM DEPTH:                   | ↓             | ↓            | EXCAVATED:           |               | YES / NO / (NA) |

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

SAMPLE COMMENTS: Sampled about 35 ft from running diesel generator

LOCATION COMMENTS: Breezy while sampling

## FIELD PARAMETERS:

|                               |       |       |                  |      |                      |       |
|-------------------------------|-------|-------|------------------|------|----------------------|-------|
| Sample Time                   | 1256  | HH:MM | Dissolved Oxygen | 7.04 | Flow (in gpm)        | 3.61  |
| Oxidation-Reduction Potential | 240.3 |       | pH               | 7.82 | Specific Conductance | 193.1 |
| Temperature                   | 20.9  |       | Turbidity        | 0.14 |                      |       |

COLLECTED BY (PRINT): T. Bonham, D. Jaramillo

|                                                                                              |                               |                                                                                   |                               |
|----------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name) <i>Allyson Stanfield</i><br>(Signature) <i>[Signature]</i> | Date/Time<br>10/31/17<br>1345 | RECEIVED BY <i>MATT ENGLERT</i><br>(Printed Name) <i>M-Englert</i><br>(Signature) | Date/Time<br>10-31-17<br>1345 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                             | Date/Time                     | RECEIVED BY<br>(Printed Name)<br>(Signature)                                      | Date/Time                     |

Report Date: 10/05/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147662

WORK ORDER:

|                                 | AS<br>PLANNED | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED                                 |
|---------------------------------|---------------|--------------|----------------------|---------------|----------------------------------------------|
| Date Collected<br>(MM/DD/YYYY): | 10-31-2017    | OK           | FIELD MATRIX:        | WG            | OK                                           |
| TIME COLLECTED<br>(HH:MM):      | 14:52         |              | MEDIA:               | OK            |                                              |
| PRS ID:                         | NA            |              | SAMPLE TECH<br>CODE: | GSP           |                                              |
| LOCATION ID:                    | R-61 S1       |              | FIELD PREP:          | UF            |                                              |
| LOCATION TYPE:                  | NA            |              | FIELD QC TYPE:       | REG           |                                              |
| TOP DEPTH:                      |               |              | SAMPLE USAGE:        | INV           |                                              |
| BOTTOM DEPTH:                   |               |              | EXCAVATED:           |               | YES / NO <input checked="" type="radio"/> NA |

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

## SAMPLE COMMENTS:

Sampled  $\approx$  50' from running diesel generator.  $\approx$  10 mph wind while sampling

## LOCATION COMMENTS:

## FIELD PARAMETERS:

|                               |       |       |                  |      |                      |       |
|-------------------------------|-------|-------|------------------|------|----------------------|-------|
| Sample Time                   | 14:52 | HH:MM | Dissolved Oxygen | 6.36 | Flow (in gpm)        | 1.96  |
| Oxidation-Reduction Potential | 2733  |       | pH               | 7.53 | Specific Conductance | 147.2 |
| Temperature                   | 19.7  |       | Turbidity        | 0.55 |                      |       |

## COLLECTED BY (PRINT):

A. Vigil

|                                                  |                                  |                                              |                               |
|--------------------------------------------------|----------------------------------|----------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>10-31-2017<br>15:45 | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time<br>10/31/17<br>1545 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature) | Date/Time                        | RECEIVED BY<br>(Printed Name)<br>(Signature) | Date/Time                     |

Report Date: 10/05/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147681

WORK ORDER:

|                                 | AS<br>PLANNED         | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED         |
|---------------------------------|-----------------------|--------------|----------------------|---------------|----------------------|
| Date Collected<br>(MM/DD/YYYY): | 10/31/17              | OK           | FIELD MATRIX:        | WG            | OK                   |
| TIME COLLECTED<br>(HH:MM):      | 1105                  |              | MEDIA:               | OK            |                      |
| PRS ID:                         | OK                    |              | SAMPLE TECH<br>CODE: | GSP           |                      |
| LOCATION ID:                    | 10/31/17<br>R-45 9251 |              | FIELD PREP:          | F             |                      |
| LOCATION TYPE:                  | OK                    |              | FIELD QC TYPE:       | FD            |                      |
| TOP DEPTH:                      | ↓                     | ↓            | SAMPLE USAGE:        | QC            | ↓                    |
| BOTTOM DEPTH:                   | ↓                     | ↓            | EXCAVATED:           |               | YES / NO / <u>NA</u> |

| PRIORITY | ORDER                            | CONTAINER             | # | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|----------|----------------------------------|-----------------------|---|--------------|---------------|----------------------|
| NA       | WSP-All Metals                   | 1 LITER POLY          | 1 | HNO3 ICE     | Y             | NA                   |
| ↓        | WSP-<br>GENINORG+PerChlorat<br>e | 1 LITER POLY          | 1 | ICE          | ↓             | ↓                    |
| ↓        | WSP-<br>NH3+NO3/NO2+PO4          | 500 ML AMBER<br>GLASS | 1 | H2SO4        | ↓             | ↓                    |

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM Dissolved Oxygen \_\_\_\_\_ Flow (in gpm) \_\_\_\_\_  
Oxidation-Reduction \_\_\_\_\_ pH \_\_\_\_\_ Speed \_\_\_\_\_  
Potential \_\_\_\_\_ Conductance \_\_\_\_\_  
Temperature \_\_\_\_\_ Turbidity \_\_\_\_\_

COLLECTED BY (PRINT):

T. Bonham, D. Jaramillo

|                                                                                            |                               |                                                                               |                               |
|--------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name) <u>Allyn Stanfield</u><br>(Signature) <u>[Signature]</u> | Date/Time<br>10/31/17<br>1345 | RECEIVED BY <u>MATT ENGLERT</u><br>(Printed Name) <u>1-EEW</u><br>(Signature) | Date/Time<br>10-31-17<br>1345 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                           | Date/Time                     | RECEIVED BY<br>(Printed Name)<br>(Signature)                                  | Date/Time                     |

Report Date: 10/05/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October  
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147685

WORK ORDER:

|                                 | AS<br>PLANNED             | AS COLLECTED |                      | AS<br>PLANNED | AS COLLECTED         |
|---------------------------------|---------------------------|--------------|----------------------|---------------|----------------------|
| Date Collected<br>(MM/DD/YYYY): | 10/31/17                  | OK           | FIELD MATRIX:        | WG            | OK                   |
| TIME COLLECTED<br>(HH:MM):      | 1105                      |              | MEDIA:               | OK            |                      |
| PRS ID:                         | OK                        |              | SAMPLE TECH<br>CODE: | GSP           |                      |
| LOCATION ID:                    | 21 10/31/17<br>R-45 SZ 61 |              | FIELD PREP:          | UF            |                      |
| LOCATION TYPE:                  | OK                        |              | FIELD QC TYPE:       | FD            |                      |
| TOP DEPTH:                      | ↓                         |              | SAMPLE USAGE:        | QC            | ↓                    |
| BOTTOM DEPTH:                   | ↓                         | ↓            | EXCAVATED:           |               | YES / NO / <u>NA</u> |

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM Dissolved Oxygen \_\_\_\_\_ Flow (in gpm) \_\_\_\_\_  
Oxidation-Reduction \_\_\_\_\_ pH \_\_\_\_\_ Specific \_\_\_\_\_  
Potential \_\_\_\_\_ Conductance \_\_\_\_\_  
Temperature \_\_\_\_\_ Turbidity \_\_\_\_\_

COLLECTED BY (PRINT): T. Bonham, D. Jaramillo

|                                                                                      |                               |                                                                                                 |                               |
|--------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------|
| RELINQUISHED BY<br>(Printed Name) Allisyn Stanford<br>(Signature) <i>[Signature]</i> | Date/Time<br>10/31/17<br>1345 | RECEIVED BY MATT ENGLERT<br>(Printed Name) <i>[Signature]</i><br>(Signature) <i>[Signature]</i> | Date/Time<br>10-31-17<br>1345 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                                     | Date/Time                     | RECEIVED BY<br>(Printed Name)<br>(Signature)                                                    | Date/Time                     |

Report Date: 10/05/2017



|                                                                        |  |                   |  |     |    |
|------------------------------------------------------------------------|--|-------------------|--|-----|----|
| COC: 2018-656                                                          |  | TEST - Explosives |  | YES | NO |
| Samples collected from a WFO area?                                     |  |                   |  |     |    |
| Field Test for Explosives Results                                      |  |                   |  | YES | NO |
| Spot test shows presence of explosives residues. If YES - Do not ship. |  |                   |  |     |    |

|                                                                                                                                                                      |  |     |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|
| TEST - Chemical Preservation                                                                                                                                         |  | YES | NO |
| Samples are chemically preserved?                                                                                                                                    |  | X   |    |
| Field Team Member Statement                                                                                                                                          |  | YES | NO |
| Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship. |  |     | X  |

|                                                                                                                                                                                                                                                     |                                               |                                                                                                   |     |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------|-----|----|
| TEST - Field Screen                                                                                                                                                                                                                                 |                                               |                                                                                                   | YES | NO |
| The sample has field screening measurements of alpha activity and beta activity?                                                                                                                                                                    |                                               |                                                                                                   |     |    |
| Sample Activity (dpm/100cm <sup>2</sup> )                                                                                                                                                                                                           | Shipment Activity (dpm/g/100cm <sup>2</sup> ) | Sampled Location                                                                                  | YES | NO |
| Alpha detectable                                                                                                                                                                                                                                    | Alpha >160,000                                | TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49 |     |    |
| Alpha > 125                                                                                                                                                                                                                                         | Alpha >1,250,000                              | other locations                                                                                   |     |    |
| Beta > 1,500                                                                                                                                                                                                                                        | Beta >15,000,000                              | any location                                                                                      |     |    |
| The sample Alpha >16,000,000 dpm/g/100cm <sup>2</sup> or Beta > 160,000,000 dpm/g/100cm <sup>2</sup> . If YES - Do not ship.                                                                                                                        |                                               |                                                                                                   |     |    |
| On the external surface of the sample container, alpha activity ≥ 24 dpm/cm <sup>2</sup> , beta activity ≥ 240 dpm/cm <sup>2</sup> , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship.                                                         |                                               |                                                                                                   |     |    |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity. |                                               |                                                                                                   |     |    |

|                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                |     |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| TEST - Location                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                | YES | NO |
| Prior analytical measurements of radioactive isotopes are available?                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                | X   |    |
| Sample Activity (pCi/g)                                                                                                                                                                                                                            | Shipment Activity (pCi)                                                                                                                                                                                                                                                                        | YES | NO |
| <ul style="list-style-type: none"> <li>Am-241 &gt; 27</li> <li>Cs-137 &gt; 270</li> <li>Pu-238 &gt; 27</li> <li>Pu-239/240 &gt; 27</li> <li>Th-228 &gt; 27</li> <li>U-234 &gt; 270</li> <li>U-238 &gt; 270</li> <li>H-3 &gt; 27,000,000</li> </ul> | <ul style="list-style-type: none"> <li>Am-241 &gt; 270,000</li> <li>Cs-137 &gt; 270,000</li> <li>Pu-238 &gt; 270,000</li> <li>Pu-239/240 &gt; 270,000</li> <li>Th-228 &gt; 270,000</li> <li>U-234 &gt; 1,600,000,000</li> <li>U-238 &gt; unlimited</li> <li>H-3 &gt; 27,000,000,000</li> </ul> |     |    |
| Am-241, Pu-238, Pu-239/240, or Th 228 > 27,000,000 pCi; or Cs-137 > 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship.                                                                                               |                                                                                                                                                                                                                                                                                                |     | X  |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes.  |                                                                                                                                                                                                                                                                                                |     | X  |

|                                                                                                                                                                                                                                                                |  |     |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|----|
| TEST - AK                                                                                                                                                                                                                                                      |  | YES | NO | NA |
| The shippers documented knowledge of the sample positively identifies appropriate labeling.                                                                                                                                                                    |  |     |    |    |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, and the sample is submitted to ARS or RP for hazard classification analysis. |  |     |    |    |

|                                                          |  |
|----------------------------------------------------------|--|
| HOLD SAMPLES FOR ANALYSIS                                |  |
| The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7] |  |

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

|                                 |           |
|---------------------------------|-----------|
| Hazard Assessment Completed By: | Date/Time |
| (Printed Name) MATT ENGLERT     | 11-01-17  |
| (Signature) <i>[Signature]</i>  | 1500      |

|                                   |           |
|-----------------------------------|-----------|
| Hazard Assessment Reviewed By:    | Date/Time |
| (Printed Name) <i>[Signature]</i> | 11/1/17   |
| (Signature) <i>[Signature]</i>    | 1500      |

## DATA VALIDATION REPORT

Chain Of Custody No. 2018-656

### 1. Distribution Of Samples In EDD.

| SDG    | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|--------|-------------------|-----------------|------------------|-------------|--------------|------------------|
| 436850 | EPA:120.1         | 3               | 1                |             |              |                  |
| 436850 | EPA:150.1         | 3               | 1                |             |              |                  |
| 436850 | EPA:160.1         | 3               | 1                |             |              |                  |
| 436850 | EPA:170.0         | 6               | 2                |             |              |                  |
| 436850 | EPA:245.2         | 6               | 2                |             |              |                  |
| 436850 | EPA:300.0         | 3               | 1                |             |              |                  |
| 436850 | EPA:310.1         | 3               | 1                |             |              |                  |
| 436850 | EPA:335.4         | 3               | 1                |             |              |                  |
| 436850 | EPA:350.1         | 3               | 1                |             |              |                  |
| 436850 | EPA:351.2         | 3               | 1                |             |              |                  |
| 436850 | EPA:353.2         | 3               | 1                |             |              |                  |
| 436850 | EPA:365.4         | 3               | 1                |             |              |                  |
| 436850 | SM:A2340B         | 3               | 1                |             |              |                  |
| 436850 | SW-846:6010C      | 3               | 1                |             |              |                  |
| 436850 | SW-846:6020       | 3               | 1                |             |              |                  |
| 436850 | SW-846:6850       | 3               | 1                |             |              |                  |
| 436850 | SW-846:9060       | 3               | 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 |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 436850 | EPA:120.1         | 1717163         | 1717163     | 3               | 1                |             |              |                  |               |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:150.1         | 1716544         | 1716544     | 3               | 1                |             |              |                  |               |               |                   |                   |                       | 1                   |                         |             | 2                |                |                |                    |                |
| 436850 | EPA:160.1         | 1716192         | 1716192     | 3               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:170.0         | NA              | NA          | 6               | 2                |             |              |                  |               |               |                   |                   |                       |                     |                         |             |                  |                |                |                    |                |
| 436850 | EPA:245.2         | 1719595         | 1719592     | 6               | 2                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:300.0         | 1715660         | 1715660     | 3               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:310.1         | 1716537         | 1716537     | 3               | 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 |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 436850 | EPA:335.4         | 1715405         | 1715404     | 3               | 1                |             |              |                  | 1             | 1             | 1                 |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:350.1         | 1715525         | 1715524     | 3               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:351.2         | 1715530         | 1715529     | 3               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:353.2         | 1716170         | 1716170     | 3               | 1                |             |              |                  | 1             |               |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | EPA:365.4         | 1715514         | 1715513     | 3               | 1                |             |              |                  | 1             | 2             |                   |                   |                       | 1                   |                         |             | 2                |                |                |                    |                |
| 436850 | SM:A2340B         | 1722509         | 1722509     | 3               | 1                |             |              |                  |               |               |                   |                   |                       |                     |                         |             |                  |                |                |                    |                |
| 436850 | SW-846:6010C      | 1715448         | 1715447     | 3               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | SW-846:6020       | 1715461         | 1715460     | 3               | 1                |             |              |                  | 1             | 1             |                   |                   |                       | 1                   |                         |             | 1                |                |                |                    |                |
| 436850 | SW-846:6850       | 1716439         | 1716438     | 3               | 1                |             |              |                  | 1             | 1             | 1                 |                   |                       | 1                   |                         |             |                  |                |                |                    |                |
| 436850 | SW-846:9060       | 1716073         | 1716073     | 3               | 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-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | CAPA-18-147571  | 1203915375    | DUP            | 1               | 0          | 0                | 0    |
| EPA:120.1         | GENERAL CHEMISTRY          | LCS             | 1203915374    | LCS            | 0               | 0          | 1                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-18-147638  | 1203913924    | DUP            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | CrIN6-18-148630 | 1203913925    | DUP            | 1               | 0          | 0                | 0    |
| EPA:150.1         | GENERAL CHEMISTRY          | LCS             | 1203913923    | LCS            | 0               | 0          | 1                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-18-147681  | 1203912969    | DUP            | 1               | 0          | 0                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |

## DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:160.1         | GENERAL CHEMISTRY          | LCS             | 1203912967    | LCS            | 0               | 0          | 1                | 0    |
| EPA:160.1         | GENERAL CHEMISTRY          | MB              | 1203912966    | MB             | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147655  | 436850002     | REG            | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147656  | 436850004     | REG            | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147662  | 436850008     | REG            | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| EPA:170.0         | VOC                        | CAMO-18-147685  | 436850006     | FD             | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147640  | 1203921494    | DUP            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147640  | 1203921495    | MS             | 0               | 0          | 1                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147655  | 436850002     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147656  | 436850004     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147662  | 436850008     | REG            | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | CAMO-18-147685  | 436850006     | FD             | 1               | 0          | 0                | 0    |
| EPA:245.2         | INORGANIC                  | LCS             | 1203921493    | LCS            | 0               | 0          | 1                | 0    |
| EPA:245.2         | INORGANIC                  | MB              | 1203921492    | MB             | 1               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-18-147640  | 1203911641    | DUP            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-18-147640  | 436850001     | REG            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 4               | 0          | 0                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | LCS             | 1203911640    | LCS            | 0               | 0          | 4                | 0    |
| EPA:300.0         | GENERAL CHEMISTRY          | MB              | 1203911639    | MB             | 4               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-18-147640  | 436850001     | REG            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CrIN6-18-148630 | 1203913916    | DUP            | 2               | 0          | 0                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | CrIN6-18-148630 | 1203913918    | MS             | 0               | 0          | 1                | 0    |
| EPA:310.1         | GENERAL CHEMISTRY          | LCS             | 1203913913    | LCS            | 0               | 0          | 1                | 0    |
| EPA:335.4         | INORGANIC                  | CAMO-18-147655  | 1203911003    | DUP            | 1               | 0          | 0                | 0    |
| EPA:335.4         | INORGANIC                  | CAMO-18-147655  | 1203911004    | MS             | 0               | 0          | 1                | 0    |
| EPA:335.4         | INORGANIC                  | CAMO-18-147655  | 1203914659    | MSD            | 0               | 0          | 1                | 0    |
| EPA:335.4         | INORGANIC                  | CAMO-18-147655  | 436850002     | REG            | 1               | 0          | 0                | 0    |



## DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| EPA:335.4         | INORGANIC                  | CAMO-18-147656  | 436850004     | REG            | 1               | 0          | 0                | 0    |
| EPA:335.4         | INORGANIC                  | CAMO-18-147662  | 436850008     | REG            | 1               | 0          | 0                | 0    |
| EPA:335.4         | INORGANIC                  | CAMO-18-147685  | 436850006     | FD             | 1               | 0          | 0                | 0    |
| EPA:335.4         | INORGANIC                  | LCS             | 1203911002    | LCS            | 0               | 0          | 1                | 0    |
| EPA:335.4         | INORGANIC                  | MB              | 1203911001    | MB             | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-18-147642  | 1203911275    | DUP            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-18-147642  | 1203911276    | MS             | 0               | 0          | 1                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | LCS             | 1203911274    | LCS            | 0               | 0          | 1                | 0    |
| EPA:350.1         | GENERAL CHEMISTRY          | MB              | 1203911273    | MB             | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-18-147655  | 1203911298    | DUP            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-18-147655  | 1203911300    | MS             | 0               | 0          | 1                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-18-147655  | 436850002     | REG            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-18-147656  | 436850004     | REG            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-18-147662  | 436850008     | REG            | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | CAMO-18-147685  | 436850006     | FD             | 1               | 0          | 0                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | LCS             | 1203911296    | LCS            | 0               | 0          | 1                | 0    |
| EPA:351.2         | GENERAL CHEMISTRY          | MB              | 1203911295    | MB             | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-18-147640  | 1203912903    | DUP            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | LCS             | 1203912902    | LCS            | 0               | 0          | 1                | 0    |
| EPA:353.2         | GENERAL CHEMISTRY          | MB              | 1203912901    | MB             | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-18-147642  | 1203911259    | DUP            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-18-147642  | 1203911260    | MS             | 0               | 0          | 1                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAPA-18-147554  | 1203911257    | DUP            | 1               | 0          | 0                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | CAPA-18-147554  | 1203911258    | MS             | 0               | 0          | 1                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | LCS             | 1203911256    | LCS            | 0               | 0          | 1                | 0    |
| EPA:365.4         | GENERAL CHEMISTRY          | MB              | 1203911255    | MB             | 1               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |

## DATA VALIDATION REPORT

| Analytical Method | Analytical Method Category | Field Sample ID | Lab Sample ID | Sample Purpose | Target Analytes | Surrogates | Spiked Compounds | TICS |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| SM:A2340B         | INORGANIC                  | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| SM:A2340B         | INORGANIC                  | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-18-147640  | 1203911108    | DUP            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-18-147640  | 1203911109    | MS             | 0               | 0          | 17               | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-18-147640  | 436850001     | REG            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-18-147641  | 436850003     | REG            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-18-147647  | 436850007     | REG            | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | CAMO-18-147681  | 436850005     | FD             | 17              | 0          | 0                | 0    |
| SW-846:6010C      | INORGANIC                  | LCS             | 1203911107    | LCS            | 0               | 0          | 17               | 0    |
| SW-846:6010C      | INORGANIC                  | MB              | 1203911106    | MB             | 17              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147640  | 1203911139    | DUP            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147640  | 1203911140    | MS             | 0               | 0          | 11               | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147640  | 436850001     | REG            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147641  | 436850003     | REG            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147647  | 436850007     | REG            | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147681  | 436850005     | FD             | 11              | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | LCS             | 1203911138    | LCS            | 0               | 0          | 11               | 0    |
| SW-846:6020       | INORGANIC                  | MB              | 1203911137    | MB             | 11              | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-18-147638  | 1203913633    | MS             | 0               | 0          | 1                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-18-147638  | 1203913634    | MSD            | 0               | 0          | 1                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-18-147640  | 436850001     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-18-147641  | 436850003     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-18-147647  | 436850007     | REG            | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | CAMO-18-147681  | 436850005     | FD             | 1               | 0          | 0                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | LCS             | 1203913632    | LCS            | 0               | 0          | 1                | 0    |
| SW-846:6850       | LCMS/MS PERCHLORATE        | MB              | 1203913631    | MB             | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-18-147655  | 436850002     | REG            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-18-147656  | 436850004     | REG            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-18-147662  | 436850008     | REG            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CAMO-18-147685  | 436850006     | FD             | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | CrIN6-18-148623 | 1203912658    | DUP            | 1               | 0          | 0                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | LCS             | 1203912656    | LCS            | 0               | 0          | 1                | 0    |
| SW-846:9060       | GENERAL CHEMISTRY          | MB              | 1203912655    | MB             | 1               | 0          | 0                | 0    |

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

## DATA VALIDATION REPORT

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          | 1203911255       | METHOD BLANK | EPA:365.4         | W      | Total Phosphate as Phosphorus | 0.0231           | J             | mg/L            | 0.050                     |
| MB          | 1203911295       | METHOD BLANK | EPA:351.2         | W      | Total Kjeldahl Nitrogen       | 0.0859           | J             | mg/L            | 0.100                     |

| Field Sample ID | Blank Lab  | 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 | Use Factors |
|-----------------|------------|--------------|-------------------|-------------------------------|------------------|-----------------|------------|---------------|---------------------|-------------|----------------------------|----------------------------|-------------|
| CAMO-18-147655  | 1203911295 | METHOD BLANK | EPA:351.2         | Total Kjeldahl Nitrogen       | 0.0859           | mg/L            | 0.070      | J             | 0.100               | Y           | 5                          | 100                        | Y           |
| CAMO-18-147656  | 1203911295 | METHOD BLANK | EPA:351.2         | Total Kjeldahl Nitrogen       | 0.0859           | mg/L            | 0.0589     | J             | 0.100               | Y           | 5                          | 100                        | Y           |
| CAMO-18-147685  | 1203911295 | METHOD BLANK | EPA:351.2         | Total Kjeldahl Nitrogen       | 0.0859           | mg/L            | 0.0629     | J             | 0.100               | Y           | 5                          | 100                        | Y           |
| CAMO-18-147662  | 1203911295 | METHOD BLANK | EPA:351.2         | Total Kjeldahl Nitrogen       | 0.0859           | mg/L            | 0.0564     | J             | 0.100               | Y           | 5                          | 100                        | Y           |
| CAMO-18-147640  | 1203911255 | METHOD BLANK | EPA:365.4         | Total Phosphate as Phosphorus | 0.0231           | mg/L            | 0.0506     |               | 0.050               | Y           | 5                          | 100                        | Y           |
| CAMO-18-147641  | 1203911255 | METHOD BLANK | EPA:365.4         | Total Phosphate as Phosphorus | 0.0231           | mg/L            | 0.0492     | J             | 0.050               | Y           | 5                          | 100                        | Y           |
| CAMO-18-147681  | 1203911255 | METHOD BLANK | EPA:365.4         | Total Phosphate as Phosphorus | 0.0231           | mg/L            | 0.0708     |               | 0.050               | Y           | 5                          | 100                        | Y           |
| CAMO-18-147647  | 1203911255 | METHOD BLANK | EPA:365.4         | Total Phosphate as Phosphorus | 0.0231           | mg/L            | 0.581      |               | 0.050               | Y           | 5                          | 100                        | Y           |

6. Any surrogate recoveries outside the control limits?

No.

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



## DATA VALIDATION REPORT

| 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-18-147655  | 1203911300       |                   | EPA:351.2         | Total Kjeldahl Nitrogen | 1715529         | 11-09-2017    | W             | 85.5              |                    | 110            | 90             | 10              |     |           |
| CAMO-18-147655  | 1203911300       |                   | EPA:351.2         | Total Kjeldahl Nitrogen | 1715529         | 11-09-2017    | W             | 85.5              |                    | 110            | 90             | 10              |     |           |
| CAMO-18-147640  | 1203911109       |                   | SW-846:6010C      | Silicon Dioxide         | 1715447         | 11-28-2017    | W             | 68.1              |                    | 125            | 75             |                 |     |           |
| CAMO-18-147640  | 1203911109       |                   | SW-846:6010C      | Silicon Dioxide         | 1715447         | 11-28-2017    | W             | 68.1              |                    | 125            | 75             |                 |     |           |

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.

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 Codes | 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 |
|-------------|------------|-----------------|----------------|--------------------|------------------|-------------------|----------------|---------------|----------------------|-------------------------|-------------|------------|-----------|---------------|--------------|------------|--------------------|------------|-------------|---------|-----------------|------------------------|----------|
|-------------|------------|-----------------|----------------|--------------------|------------------|-------------------|----------------|---------------|----------------------|-------------------------|-------------|------------|-----------|---------------|--------------|------------|--------------------|------------|-------------|---------|-----------------|------------------------|----------|

## DATA VALIDATION REPORT

| Location ID | COC Number | Field Sample ID | Sample Purpose | Analysis Type Code | Analytical Suite  | Analytical Method | Paramter Name                 | Lab Qualifier | Validation Qualifier | Validation Reason Codes | 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-45 S1     | 2018-656   | CAMO-18-147640  | REG            | INIT               | INORGANIC         | SW-846:6010C      | Silicon Dioxide               | J-            | I6a                  | Y                       | 67200       | ug/L       | 67.2      | mg/L          |              |            | W                  | 10/31/2017 |             | 1715448 | VAL             | Y                      |          |
| R-45 S1     | 2018-656   | CAMO-18-147640  | REG            | INIT               | GENERAL CHEMISTRY | EPA:365.4         | Total Phosphate as Phosphorus | U             | I4                   | N                       | 0.0506      | mg/L       | 0.0506    | mg/L          |              |            | W                  | 10/31/2017 |             | 1715514 | VAL             | Y                      |          |
| R-45 S2     | 2018-656   | CAMO-18-147641  | REG            | INIT               | GENERAL CHEMISTRY | EPA:365.4         | Total Phosphate as Phosphorus | J             | I4                   | N                       | 0.0492      | mg/L       | 0.0492    | mg/L          |              |            | W                  | 10/31/2017 |             | 1715514 | VAL             | Y                      |          |
| R-61 S1     | 2018-656   | CAMO-18-147647  | REG            | INIT               | GENERAL CHEMISTRY | EPA:365.4         | Total Phosphate as Phosphorus | J+            | I4a                  | Y                       | 0.581       | mg/L       | 0.581     | mg/L          |              |            | W                  | 10/31/2017 |             | 1715514 | VAL             | Y                      |          |
| R-45 S1     | 2018-656   | CAMO-18-147655  | REG            | INIT               | GENERAL CHEMISTRY | EPA:351.2         | Total Kjeldahl Nitrogen       | J             | I4                   | N                       | 0.070       | mg/L       | 0.070     | mg/L          |              |            | W                  | 10/31/2017 |             | 1715530 | VAL             | Y                      |          |
| R-45 S2     | 2018-656   | CAMO-18-147656  | REG            | INIT               | GENERAL CHEMISTRY | EPA:351.2         | Total Kjeldahl Nitrogen       | J             | I4                   | N                       | 0.0589      | mg/L       | 0.0589    | mg/L          |              |            | W                  | 10/31/2017 |             | 1715530 | VAL             | Y                      |          |
| R-61 S1     | 2018-656   | CAMO-18-147662  | REG            | INIT               | GENERAL CHEMISTRY | EPA:351.2         | Total Kjeldahl Nitrogen       | J             | I4                   | N                       | 0.0564      | mg/L       | 0.0564    | mg/L          |              |            | W                  | 10/31/2017 |             | 1715530 | VAL             | Y                      |          |
| R-45 S2     | 2018-656   | CAMO-18-147681  | FD             | INIT               | GENERAL CHEMISTRY | EPA:365.4         | Total Phosphate as Phosphorus | U             | I4                   | N                       | 0.0708      | mg/L       | 0.0708    | mg/L          |              |            | W                  | 10/31/2017 |             | 1715514 | VAL             | Y                      |          |
| R-45 S2     | 2018-656   | CAMO-18-147685  | FD             | INIT               | GENERAL CHEMISTRY | EPA:351.2         | Total Kjeldahl Nitrogen       | J             | I4                   | N                       | 0.0629      | mg/L       | 0.0629    | mg/L          |              |            | W                  | 10/31/2017 |             | 1715530 | VAL             | Y                      |          |

### Reason Code

### Description

I4

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

I4a

The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x

I6a

The associated matrix spike recovery was below the lower acceptance limit (LAL) but >10%. Follow the external laboratory limits located within the associated data package.

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 qualify. 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-18-147640  | R-45 S1     | REG            | EPA:120.1         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:150.1         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:160.1         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:170.0         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:300.0         | 0                     | 4             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:310.1         | 0                     | 2             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:350.1         | 0                     | 1             |

## DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-18-147640  | R-45 S1     | REG            | EPA:353.2         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | EPA:365.4         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | SM:A2340B         | 0                     | 1             |
| CAMO-18-147640  | R-45 S1     | REG            | SW-846:6010C      | 0                     | 17            |
| CAMO-18-147640  | R-45 S1     | REG            | SW-846:6020       | 0                     | 11            |
| CAMO-18-147640  | R-45 S1     | REG            | SW-846:6850       | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:120.1         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:150.1         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:160.1         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:170.0         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:300.0         | 0                     | 4             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:310.1         | 0                     | 2             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:350.1         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:353.2         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | EPA:365.4         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | SM:A2340B         | 0                     | 1             |
| CAMO-18-147641  | R-45 S2     | REG            | SW-846:6010C      | 0                     | 17            |
| CAMO-18-147641  | R-45 S2     | REG            | SW-846:6020       | 0                     | 11            |
| CAMO-18-147641  | R-45 S2     | REG            | SW-846:6850       | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:120.1         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:150.1         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:160.1         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:170.0         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:300.0         | 0                     | 4             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:310.1         | 0                     | 2             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:350.1         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:353.2         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | EPA:365.4         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | SM:A2340B         | 0                     | 1             |
| CAMO-18-147647  | R-61 S1     | REG            | SW-846:6010C      | 0                     | 17            |
| CAMO-18-147647  | R-61 S1     | REG            | SW-846:6020       | 0                     | 11            |
| CAMO-18-147647  | R-61 S1     | REG            | SW-846:6850       | 0                     | 1             |
| CAMO-18-147655  | R-45 S1     | REG            | EPA:170.0         | 0                     | 1             |
| CAMO-18-147655  | R-45 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-18-147655  | R-45 S1     | REG            | EPA:335.4         | 0                     | 1             |



## DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-18-147655  | R-45 S1     | REG            | EPA:351.2         | 0                     | 1             |
| CAMO-18-147655  | R-45 S1     | REG            | SW-846:9060       | 0                     | 1             |
| CAMO-18-147656  | R-45 S2     | REG            | EPA:170.0         | 0                     | 1             |
| CAMO-18-147656  | R-45 S2     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-18-147656  | R-45 S2     | REG            | EPA:335.4         | 0                     | 1             |
| CAMO-18-147656  | R-45 S2     | REG            | EPA:351.2         | 0                     | 1             |
| CAMO-18-147656  | R-45 S2     | REG            | SW-846:9060       | 0                     | 1             |
| CAMO-18-147662  | R-61 S1     | REG            | EPA:170.0         | 0                     | 1             |
| CAMO-18-147662  | R-61 S1     | REG            | EPA:245.2         | 0                     | 1             |
| CAMO-18-147662  | R-61 S1     | REG            | EPA:335.4         | 0                     | 1             |
| CAMO-18-147662  | R-61 S1     | REG            | EPA:351.2         | 0                     | 1             |
| CAMO-18-147662  | R-61 S1     | REG            | SW-846:9060       | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:120.1         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:150.1         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:160.1         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:170.0         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:245.2         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:300.0         | 0                     | 4             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:310.1         | 0                     | 2             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:350.1         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:353.2         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | EPA:365.4         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | SM:A2340B         | 0                     | 1             |
| CAMO-18-147681  | R-45 S2     | FD             | SW-846:6010C      | 0                     | 17            |
| CAMO-18-147681  | R-45 S2     | FD             | SW-846:6020       | 0                     | 11            |
| CAMO-18-147681  | R-45 S2     | FD             | SW-846:6850       | 0                     | 1             |
| CAMO-18-147685  | R-45 S2     | FD             | EPA:170.0         | 0                     | 1             |
| CAMO-18-147685  | R-45 S2     | FD             | EPA:245.2         | 0                     | 1             |
| CAMO-18-147685  | R-45 S2     | FD             | EPA:335.4         | 0                     | 1             |
| CAMO-18-147685  | R-45 S2     | FD             | EPA:351.2         | 0                     | 1             |
| CAMO-18-147685  | R-45 S2     | FD             | SW-846:9060       | 0                     | 1             |

## DATA VALIDATION REPORT

Chain Of Custody No. 2018-656

### 1. Distribution Of Samples In EDD.

| SDG    | Analytical Method | Regular Samples | Field Duplicates | Trip Blanks | Field Blanks | Equipment Blanks |
|--------|-------------------|-----------------|------------------|-------------|--------------|------------------|
| 439253 | SW-846:6020       |                 | 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 |
|--------|-------------------|-----------------|-------------|-----------------|------------------|-------------|--------------|------------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-------------------------|-------------|------------------|----------------|----------------|--------------------|----------------|
| 439253 | SW-846:6020       | 1724775         | 1724774     |                 | 1                |             |              |                  | 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 |
|-------------------|----------------------------|-----------------|---------------|----------------|-----------------|------------|------------------|------|
| SW-846:6020       | INORGANIC                  | CAMO-18-147681  | 1203934751    | DUP            | 1               | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147681  | 1203934752    | MS             | 0               | 0          | 1                | 0    |
| SW-846:6020       | INORGANIC                  | CAMO-18-147681  | 439253001     | FD             | 1               | 0          | 0                | 0    |
| SW-846:6020       | INORGANIC                  | LCS             | 1203934750    | LCS            | 0               | 0          | 1                | 0    |
| SW-846:6020       | INORGANIC                  | MB              | 1203934749    | MB             | 1               | 0          | 0                | 0    |

### 3. Are any analytes missing?

No.

### 4. Were any holding times exceeded?

No.

### 5. Any contaminants in blanks?

No.

## DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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.

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.

None.

| <b><u>Reason Code</u></b> | <b><u>Description</u></b>                                                                                                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| NQ                        | The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualify. The analyte is detected in the sample. |

14. Usable Result Count.

## DATA VALIDATION REPORT

| Field Sample ID | Location ID | Sample Purpose | Analytical Method | No. Unuseable Records | Total Records |
|-----------------|-------------|----------------|-------------------|-----------------------|---------------|
| CAMO-18-147681  | R-45 S2     | FD             | SW-846:6020       | 0                     | 1             |



November 27, 2017

[gel.com](http://gel.com)

Ms. Nita Patel  
Los Alamos National Laboratory  
TA-00, SM1237, Rm104C  
Los Alamos, New Mexico 87545

Re: LANL- WQH Water Samples  
Work Order: 436850  
SDG: 2018-656

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on November 02, 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,



Katrina Hiott for  
Valerie Davis  
Project Manager

Chain of Custody: 2018-656  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 436850**  
**SDG: 2018-656**

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# Case Narrative



**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 436850  
SDG # : 2018-656**

**November 27, 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 November 02, 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 temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

| <b><u>Laboratory ID</u></b> | <b><u>Client ID</u></b> |
|-----------------------------|-------------------------|
| 436850001                   | CAMO-18-147640          |
| 436850002                   | CAMO-18-147655          |
| 436850003                   | CAMO-18-147641          |
| 436850004                   | CAMO-18-147656          |
| 436850005                   | CAMO-18-147681          |
| 436850006                   | CAMO-18-147685          |
| 436850007                   | CAMO-18-147647          |
| 436850008                   | CAMO-18-147662          |


**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.

  
Katrina Hiott for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 27 November 2017**

| <b>State</b>             | <b>Certification</b>         |
|--------------------------|------------------------------|
| 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                   | SC000122018-1                |
| 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                     |
| Puerto Rico              | SC00012                      |
| S.Carolina Radchem       | 10120002                     |
| South Carolina Chemistry | 10120001                     |
| Tennessee                | TN 02934                     |
| Texas NELAP              | T104704235-17-12             |
| Utah NELAP               | SC000122017-24               |
| Vermont                  | VT87156                      |
| Virginia NELAP           | 460202                       |
| Washington               | C780                         |
| West Virginia            | 997404                       |

# **Chain of Custody and Supporting Documentation**



[illegible]

| Special Instructions:            |                                |                           |                                |                               |                           |
|----------------------------------|--------------------------------|---------------------------|--------------------------------|-------------------------------|---------------------------|
| Relinquished by: <u>M. Esler</u> | Print Name: <u>MATT EWLETT</u> | Date/Time: <u>11-1-17</u> | Received by: <u>J. Hartley</u> | Print Name: <u>J. Hartley</u> | Date/Time: <u>11/2/17</u> |
| Relinquished by:                 | Print Name:                    | Date/Time:                | Received by:                   | Print Name:                   | Date/Time:                |
| Relinquished by:                 | Print Name:                    | Date/Time:                | Received by:                   | Print Name:                   | Date/Time:                |

|                                                                        |  |                   |  |     |    |
|------------------------------------------------------------------------|--|-------------------|--|-----|----|
| COC: 2018-656                                                          |  | TEST - Explosives |  | YES | NO |
| Samples collected from a WFO area?                                     |  |                   |  |     |    |
| Field Test for Explosives Results                                      |  |                   |  | YES | NO |
| Spot test shows presence of explosives residues. If YES - Do not ship. |  |                   |  |     |    |

|                                                                                                                                                                      |  |     |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|
| TEST - Chemical Preservation                                                                                                                                         |  | YES | NO |
| Samples are chemically preserved?                                                                                                                                    |  | X   |    |
| Field Team Member Statement                                                                                                                                          |  | YES | NO |
| Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship. |  |     | X  |

|                                                                                                                                                                                                                                                     |                                               |                                                                                                   |     |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------|-----|----|
| TEST - Field Screen                                                                                                                                                                                                                                 |                                               |                                                                                                   | YES | NO |
| The sample has field screening measurements of alpha activity and beta activity?                                                                                                                                                                    |                                               |                                                                                                   |     |    |
| Sample Activity (dpm/100cm <sup>2</sup> )                                                                                                                                                                                                           | Shipment Activity (dpm*g/100cm <sup>2</sup> ) | Sampled Location                                                                                  | YES | NO |
| Alpha detectable                                                                                                                                                                                                                                    | Alpha >160,000                                | TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49 |     |    |
| Alpha > 125                                                                                                                                                                                                                                         | Alpha >1,250,000                              | other locations                                                                                   |     |    |
| Beta > 1,500                                                                                                                                                                                                                                        | Beta >15,000,000                              | any location                                                                                      |     |    |
| The sample Alpha >16,000,000 dpm*g/100cm <sup>2</sup> or Beta > 160,000,000 dpm*g/100cm <sup>2</sup> . If YES - Do not ship.                                                                                                                        |                                               |                                                                                                   |     |    |
| On the external surface of the sample container, alpha activity ≥ 24 dpm/cm <sup>2</sup> , beta activity ≥ 240 dpm/cm <sup>2</sup> , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship.                                                         |                                               |                                                                                                   |     |    |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity. |                                               |                                                                                                   |     |    |

|                                                                                                                                                                                                                                                   |                         |     |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----|----|
| TEST - Location                                                                                                                                                                                                                                   |                         | YES | NO |
| Prior analytical measurements of radioactive isotopes are available?                                                                                                                                                                              |                         | X   |    |
| Sample Activity (pCi/g)                                                                                                                                                                                                                           | Shipment Activity (pCi) | YES | NO |
| • Am-241 > 27                                                                                                                                                                                                                                     | • Am-241 > 270,000      |     |    |
| • Cs-137 > 270                                                                                                                                                                                                                                    | • Cs-137 > 270,000      |     |    |
| • Pu-238 > 27                                                                                                                                                                                                                                     | • Pu-238 > 270,000      |     |    |
| • Pu-239/240 > 27                                                                                                                                                                                                                                 | • Pu-239/240 > 270,000  |     |    |
| • Th-228 > 27                                                                                                                                                                                                                                     | • Th-228 > 270,000      |     |    |
| • U-234 > 270                                                                                                                                                                                                                                     | • U-234 > 1,600,000,000 |     |    |
| • U-238 > 270                                                                                                                                                                                                                                     | • U-238 > unlimited     |     | X  |
| • H-3 > 27,000,000                                                                                                                                                                                                                                | • H-3 > 27,000,000,000  |     |    |
| Am-241, Pu-238, Pu-239/240, or Th 228 > 27,000,000 pCi; or Cs-137 > 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship.                                                                                              |                         |     | X  |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes. |                         |     | X  |

|                                                                                                                                                                                                                                                                |  |     |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|----|
| TEST - AK                                                                                                                                                                                                                                                      |  | YES | NO | NA |
| The shippers documented knowledge of the sample positively identifies appropriate labeling.                                                                                                                                                                    |  |     |    |    |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, and the sample is submitted to ARS or RP for hazard classification analysis. |  |     |    |    |

|                                                          |  |
|----------------------------------------------------------|--|
| HOLD SAMPLES FOR ANALYSIS                                |  |
| The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7] |  |

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

|                                 |           |
|---------------------------------|-----------|
| Hazard Assessment Completed By: | Date/Time |
| (Printed Name) MATT ENGLERT     | 11-01-17  |
| (Signature) <i>[Signature]</i>  | 1500      |

|                                   |           |
|-----------------------------------|-----------|
| Hazard Assessment Reviewed By:    | Date/Time |
| (Printed Name) <i>[Signature]</i> | 11/1/17   |
| (Signature) <i>[Signature]</i>    | 1500      |

**SAMPLE RECEIPT & REVIEW FORM**

| Client: <u>QRL</u>                                                |                                                                     | SDG/AR/COC/Work Order: <u>436850</u>                                                                                                                                                                                                                                                                                          |                          |                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Received By: <u>[Signature]</u>                                   |                                                                     | Date Received: <u>11/2/17</u>                                                                                                                                                                                                                                                                                                 |                          |                                                                                                                                                                                                                                                                                                                         |
| Carrier and Tracking Number                                       |                                                                     | Circle Applicable:<br><input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other<br><u>590817831000-5</u><br><u>590817831011-5</u><br><u>590817831022-6</u> |                          |                                                                                                                                                                                                                                                                                                                         |
| Suspected Hazard Information                                      | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.                                                                                                                                                                                                    |                          |                                                                                                                                                                                                                                                                                                                         |
| Shipped as a DOT Hazardous?                                       | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Hazard Class Shipped: _____ UN#: _____                                                                                                                                                                                                                                                                                        |                          |                                                                                                                                                                                                                                                                                                                         |
| COC/Samples marked or classified as radioactive?                  | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPd / mR/Hr<br>Classified as: Rad 1 Rad 2 Rad 3                                                                                                                                                                                             |                          |                                                                                                                                                                                                                                                                                                                         |
| Is package, COC, and/or Samples marked HAZ?                       | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | If yes, select Hazards below, and contact the GEL Safety Group.<br>PCB's    Flammable    Foreign Soil    RCRA    Asbestos    Beryllium    Other: _____                                                                                                                                                                        |                          |                                                                                                                                                                                                                                                                                                                         |
| Sample Receipt Criteria                                           | Yes                                                                 | NA                                                                                                                                                                                                                                                                                                                            | No                       | Comments/Qualifiers (Required for Non-Conforming Items)                                                                                                                                                                                                                                                                 |
| 1 Shipping containers received intact and sealed?                 | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Circle Applicable: Seals broken    Damaged container    Leaking container    Other (describe)                                                                                                                                                                                                                           |
| 2 Chain of custody documents included with shipment?              | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> |                                                                                                                                                                                                                                                                                                                         |
| 3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*     | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Preservation Method: Wet Ice <u>Ice Packs</u> Dry Ice    None    Other:<br>*all temperatures are recorded in Celsius <u>See TEMP Above</u>                                                                                                                                                                              |
| 4 Daily check performed and passed on IR temperature gun?         | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Temperature Device Serial #: <u>R3-16</u><br>Secondary Temperature Device Serial # (If Applicable): _____                                                                                                                                                                                                               |
| 5 Sample containers intact and sealed?                            | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Circle Applicable: Seals broken    Damaged container    Leaking container    Other (describe)                                                                                                                                                                                                                           |
| 6 Samples requiring chemical preservation at proper pH?           | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Sample ID's and Containers Affected:<br>If Preservation added, Lot#:                                                                                                                                                                                                                                                    |
| 7 Do any samples require Volatile Analysis?                       | <input type="checkbox"/>                                            | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | If Yes, Are Encores or Soil Kits present? Yes _____ No _____ (If yes, take to VOA Freezer)<br>Do VOA vials contain acid preservation? Yes _____ No _____ N/A (If unknown, select No)<br>VOA vials free of headspace? Yes _____ No _____ N/A<br>Sample ID's and containers affected: <input checked="" type="checkbox"/> |
| 8 Samples received within holding time?                           | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | ID's and tests affected:                                                                                                                                                                                                                                                                                                |
| 9 Sample ID's on COC match ID's on bottles?                       | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Sample ID's and containers affected:                                                                                                                                                                                                                                                                                    |
| 10 Date & time on COC match date & time on bottles?               | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Sample ID's affected:                                                                                                                                                                                                                                                                                                   |
| 11 Number of containers received match number indicated on COC?   | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> | Sample ID's affected:                                                                                                                                                                                                                                                                                                   |
| 12 Are sample containers identifiable as GEL provided?            | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> |                                                                                                                                                                                                                                                                                                                         |
| 13 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/>                                 | <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> |                                                                                                                                                                                                                                                                                                                         |
| Comments (Use Continuation Form if needed):                       |                                                                     |                                                                                                                                                                                                                                                                                                                               |                          |                                                                                                                                                                                                                                                                                                                         |

PM (or PMA) review: Initials khioth

Date 11/2/17

Page 1 of 1

GL-CHL-SR-001 Rev 5

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: 01NOV17  
ACTWGT: 25.0 LB MAN  
CAD: 0014176/CAFE2916

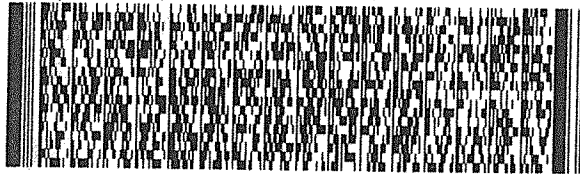
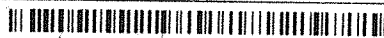
BILL SENDER

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

**CHARLESTON SC 29407**

(843) 656-8171

REF: WE6L11551000



**FedEx**  
Express



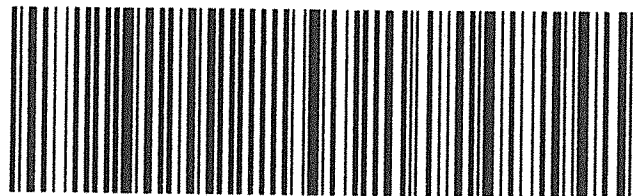
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0201

THU - 02 NOV 10:30A  
PRIORITY OVERNIGHT

**X7 RBWA**

29407  
SC-US CHS

Part #: 156148V-434 FIT2 06/15





ORIGIN ID: SAFA (505) 665-9966  
 KEITH GREENE  
 LOS ALAMOS NATL LAB.  
 TAOO BLDG 1237 DPU 03  
 LOS ALAMOS, NM 87545  
 UNITED STATES US

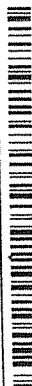
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 ACTWT: 44.0 LB MAN  
 CAD: 0014176/CAFE2916

BILL SENDER

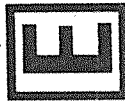
TO **VALERIE DAVIS**  
**GENERAL ENGINEERING LAB**  
**2040 SAVAGE RD**

**CHARLESTON SC 29407**

(843) 556-8171  
 REF: 21PD0ASRGW04BAGWS0



**FedEx**  
Express



THU - 02 NOV 10:30  
 PRIORITY OVERNIGHT

1 of 2

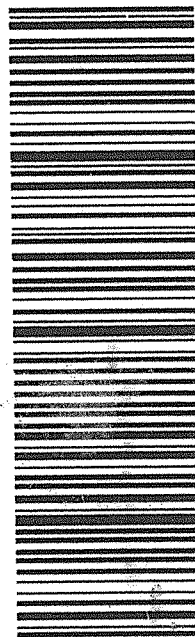
TRK# 5908 1783 1000

## MASTER ##

**X7 RBWA**

29407  
 CHS  
 SC-US

Part # 156148V-434 RIT2 06/15 88



ORIGIN ID: SAFA (505) 665-9966  
 KEITH GREENE  
 LOS ALAMOS NATL LAB.  
 TAOO BLDG 1237 DPU 03  
 LOS ALAMOS, NM 87545  
 UNITED STATES US

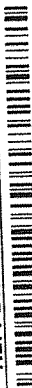
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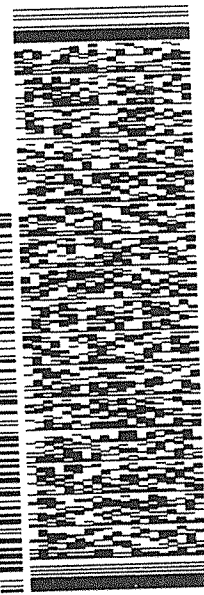
TO **VALERIE DAVIS**  
**GENERAL ENGINEERING LAB**  
**2040 SAVAGE RD**

**CHARLESTON SC 29407**

(843) 556-8171  
 REF: 21PD0ASRGW04BAGWS0



**FedEx**  
Express



THU - 02 NOV 10:30  
 PRIORITY OVERNIGHT

2 of 2

MPS# 5908 1783 1011

0263

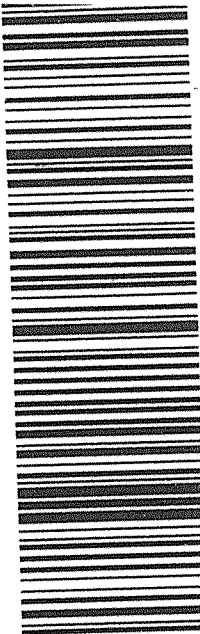
Mstr# 5908 1783 1000

0201

**X7 RBWA**

294  
 SC-US C

Part # 156148V-434 RIT2 06/15 88



# **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<br>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<br>identification of the analyte (TIC). Quantitation is based on nearest internal standard<br>response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration<br>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 #: 2018-656  
Work Order #: 436850**

**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: 1716439

Prep Batch Number: 1716438

**Sample Analysis**

| <b>Sample ID</b> | <b>Client ID</b>                                       |
|------------------|--------------------------------------------------------|
| 436850001        | 436850001 (CAMO-18-147640)                             |
| 436850003        | 436850003 (CAMO-18-147641)                             |
| 436850005        | 436850005 (CAMO-18-147681)                             |
| 436850007        | 436850007 (CAMO-18-147647)                             |
| 1203913635       | Interference Check Sample (ICS)                        |
| 1203913631       | Method Blank (MB)                                      |
| 1203913632       | Laboratory Control Sample (LCS)                        |
| 1203913633       | 436689001(CAMO-18-147638) Matrix Spike (MS)            |
| 1203913634       | 436689001(CAMO-18-147638) 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.

### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

### **Interference Check Sample (ICS)**

The ICS spike recoveries met the acceptance criteria.

### **QC Sample Designation**

Client sample 436689001 (CAMO-18-147638) 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**

Sample 436850007 (CAMO-18-147647) was diluted to bring the over range concentration within the calibration range.

#### **Sample Re-extraction/Re-analysis**

Re-extractions or re-analyses were not required in this SDG.

#### **Miscellaneous Information**

##### **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: 2018-656 GEL Work Order: 436850

#### 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
- J Value is estimated
- 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: 13 NOV 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147640Date Received: 02-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 436850001Date Filtered: 07-NOV-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 | 0.588 | ug/L  |   | 1               | 07-NOV-17 19:31 | per1107021a |
|            | Perchlorate Isotope Ratio |     |    | 3.18  |       |   | 1               | 07-NOV-17 19:31 | per1107021a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.570 | ug/L  |   | 1               | 07-NOV-17 19:31 | per1107021a |
|            | Perchlorate-O(18)         |     |    | 0.446 | ug/L  |   | 1               | 07-NOV-17 19:31 | per1107021a |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147641Date Received: 02-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 436850003Date Filtered: 07-NOV-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 | 0.557 | ug/L  |   | 1               | 07-NOV-17 19:40 | per1107022a |
|            | Perchlorate Isotope Ratio |     |    | 3.09  |       |   | 1               | 07-NOV-17 19:40 | per1107022a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.556 | ug/L  |   | 1               | 07-NOV-17 19:40 | per1107022a |
|            | Perchlorate-O(18)         |     |    | 0.440 | ug/L  |   | 1               | 07-NOV-17 19:40 | per1107022a |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147681Date Received: 02-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 436850005Date Filtered: 07-NOV-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 | 0.579 | ug/L  |   | 1               | 07-NOV-17 20:18 | per1107026a |
|            | Perchlorate Isotope Ratio |     |    | 3.19  |       |   | 1               | 07-NOV-17 20:18 | per1107026a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.561 | ug/L  |   | 1               | 07-NOV-17 20:18 | per1107026a |
|            | Perchlorate-O(18)         |     |    | 0.426 | ug/L  |   | 1               | 07-NOV-17 20:18 | per1107026a |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147647Date Received: 02-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 436850007Date Filtered: 07-NOV-17Injection Volume (uL): 20%Solids:           

| CAS No.    | Analyte^                  | MDL | RL | Conc* | Units | Q | Dilution Factor | Date Analyzed   | GEL File ID |
|------------|---------------------------|-----|----|-------|-------|---|-----------------|-----------------|-------------|
| 14797-73-0 | Perchlorate               | .5  | 2  | 10.7  | ug/L  |   | 10              | 08-NOV-17 19:23 | per1108013a |
|            | Perchlorate Isotope Ratio |     |    | 3.05  |       |   | 10              | 08-NOV-17 19:23 | per1108013a |
| 14797-73-0 | Perchlorate-101           | .5  | 2  | 11.2  | ug/L  |   | 10              | 08-NOV-17 19:23 | per1108013a |
|            | Perchlorate-O(18)         |     |    | 5.07  | ug/L  |   | 10              | 08-NOV-17 19:23 | per1108013a |

^ 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):** 2018-656

**Extract Batch Code:** 1716438

**Date Filtered:** 07-NOV-17

**Matrix:** WATER

**Sample ID:** 1203913632

| Analyte^                  | True  | Found | Units | %Rec | Q | Control Limits |
|---------------------------|-------|-------|-------|------|---|----------------|
| Perchlorate               | 0.200 | .181  | ug/L  | 90   |   | 85 - 115       |
| Perchlorate Isotope Ratio |       | 2.76  |       |      |   | -              |
| Perchlorate-101           | 0.200 | .202  | ug/L  | 101  |   | 85 - 115       |
| Perchlorate-O(18)         |       | .42   | 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

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**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2018-656

**Extract Batch Code:** 1716438

**Date Extracted:** 07-NOV-17

**GEL MS/PS ID:** 1203913633

**Client ID:** CAMO-18-147638

**GEL MSD/PSD ID:** 1203913634

**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       | 0.406       | ug/L  | 0.591   | 93       | .567     | 81        | 4     | 30        | 75 - 125       |
| Perchlorate Isotope Ratio | 0           | 3.09        |       | 2.97    |          | 3.09     |           | 4     |           | -              |
| Perchlorate-101           | 0.200       | 0.405       | ug/L  | 0.615   | 105      | .566     | 80        | 8     | 30        | 75 - 125       |
| Perchlorate-O(18)         | 0           | 0.460       | ug/L  | 0.447   |          | .464     |           | 4     |           | -              |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 07-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 1203913631Date Filtered: 07-NOV-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 | 0.050 | ug/L  | U | 1               | 07-NOV-17 18:15 | per1107013a |
|            | Perchlorate Isotope Ratio |     |    |       |       |   | 1               | 07-NOV-17 18:15 | per1107013a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.050 | ug/L  | U | 1               | 07-NOV-17 18:15 | per1107013a |
|            | Perchlorate-O(18)         |     |    | 0.436 | ug/L  |   | 1               | 07-NOV-17 18:15 | per1107013a |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 07-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 1203913632Date Filtered: 07-NOV-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 | 0.181 | ug/L  | J | 1               | 07-NOV-17 18:25 | per1107014a |
|            | Perchlorate Isotope Ratio |     |    | 2.76  |       |   | 1               | 07-NOV-17 18:25 | per1107014a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.202 | ug/L  |   | 1               | 07-NOV-17 18:25 | per1107014a |
|            | Perchlorate-O(18)         |     |    | 0.420 | ug/L  |   | 1               | 07-NOV-17 18:25 | per1107014a |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-656GEL Sample ID: 1203913635Date Filtered: 07-NOV-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 | 0.206 | ug/L  |   | 1               | 07-NOV-17 18:34 | per1107015a |
|            | Perchlorate Isotope Ratio |     |    | 2.97  |       |   | 1               | 07-NOV-17 18:34 | per1107015a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.214 | ug/L  |   | 1               | 07-NOV-17 18:34 | per1107015a |
|            | Perchlorate-O(18)         |     |    | 0.442 | ug/L  |   | 1               | 07-NOV-17 18:34 | per1107015a |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147638MSDate Received: 01-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 1203913633Date Filtered: 07-NOV-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 | 0.591 | ug/L  |   | 1               | 07-NOV-17 18:53 | per1107017a |
|            | Perchlorate Isotope Ratio |     |    | 2.97  |       |   | 1               | 07-NOV-17 18:53 | per1107017a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.615 | ug/L  |   | 1               | 07-NOV-17 18:53 | per1107017a |
|            | Perchlorate-O(18)         |     |    | 0.447 | ug/L  |   | 1               | 07-NOV-17 18:53 | per1107017a |

^ 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: 1716438Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147638MSDDate Received: 01-NOV-17GEL Job No (SDG): 2018-656GEL Sample ID: 1203913634Date Filtered: 07-NOV-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 | 0.567 | ug/L  |   | 1               | 07-NOV-17 19:03 | per1107018a |
|            | Perchlorate Isotope Ratio |     |    | 3.09  |       |   | 1               | 07-NOV-17 19:03 | per1107018a |
| 14797-73-0 | Perchlorate-101           | .05 | .2 | 0.566 | ug/L  |   | 1               | 07-NOV-17 19:03 | per1107018a |
|            | Perchlorate-O(18)         |     |    | 0.464 | ug/L  |   | 1               | 07-NOV-17 19:03 | per1107018a |

^ 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 #: 2018-656**  
**Work Order #: 436850**

| <b>Sample ID</b> | <b>Client ID</b>                                  |
|------------------|---------------------------------------------------|
| 436850001        | CAMO-18-147640                                    |
| 436850002        | CAMO-18-147655                                    |
| 436850003        | CAMO-18-147641                                    |
| 436850004        | CAMO-18-147656                                    |
| 436850005        | CAMO-18-147681                                    |
| 436850006        | CAMO-18-147685                                    |
| 436850007        | CAMO-18-147647                                    |
| 436850008        | CAMO-18-147662                                    |
| 1203911106       | Method Blank (MB) <b>ICP</b>                      |
| 1203911107       | Laboratory Control Sample (LCS)                   |
| 1203911110       | 436850001(CAMO-18-147640L) Serial Dilution (SD)   |
| 1203911108       | 436850001(CAMO-18-147640D) Sample Duplicate (DUP) |
| 1203911109       | 436850001(CAMO-18-147640S) Matrix Spike (MS)      |
| 1203911137       | Method Blank (MB) <b>ICP-MS</b>                   |
| 1203911138       | Laboratory Control Sample (LCS)                   |
| 1203911141       | 436850001(CAMO-18-147640L) Serial Dilution (SD)   |
| 1203911139       | 436850001(CAMO-18-147640D) Sample Duplicate (DUP) |
| 1203911140       | 436850001(CAMO-18-147640S) Matrix Spike (MS)      |
| 1203921492       | Method Blank (MB) <b>CVAA</b>                     |
| 1203921493       | Laboratory Control Sample (LCS)                   |
| 1203921496       | 436850001(CAMO-18-147640L) Serial Dilution (SD)   |
| 1203921494       | 436850001(CAMO-18-147640D) Sample Duplicate (DUP) |
| 1203921495       | 436850001(CAMO-18-147640S) Matrix Spike (MS)      |

**Sample Analysis**

Samples 436850001,002,003,004,005,006,007 and 008 in this SDG were analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

|                                       |                                                                                                            |
|---------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Analytical Batch:</b>              | 1715448, 1715461, 1719595 and 1722509                                                                      |
| <b>Prep Batch :</b>                   | 1715447, 1715460 and 1719592                                                                               |
| <b>Standard Operating Procedures:</b> | GL-MA-E-013 REV# 30, GL-MA-E-006 REV# 14, GL-MA-E-014 REV# 32, GL-MA-E-010 REV# 36 and GL-GC-E-107 REV# 10 |
| <b>Analytical Method:</b>             | SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B                                         |
| <b>Prep Method :</b>                  | 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 CaCO<sub>3</sub> is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a PE 7300 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-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 350X 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 CRDL/PQL standard recoveries met the referenced advisory control limits.

### **ICSA/ICSAB Statement**

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. For the ICP-MS analysis, the ICSA solution contains 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

### **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: 436850001 (CAMO-18-147640)-ICP, ICP-MS and 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**

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

| Analyte   | Sample                           | Value          |
|-----------|----------------------------------|----------------|
| Sodium    | 1203911110 (CAMO-18-147640SDILT) | 10.8 *(0%-10%) |
| Strontium | 1203911110 (CAMO-18-147640SDILT) | 12.8 *(0%-10%) |

**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.

**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.

Hardness = 2.497 (Ca) + 4.118 (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: 2018-656 GEL Work Order: 436850

#### The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- E %difference of sample and SD is >10%. Sample concentration must meet flagging 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: 29 NOV 2017

Title: Data Validator

# **Sample Data Summary**

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850001**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147640**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 10:35 | 111717W4-6     | 1719595          |

**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 2018-656

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436850001

BASIS: As Received

DATE COLLECTED 31-OCT-17

CLIENT ID: CAMO-18-147640

LEVEL: Low

DATE RECEIVED 02-NOV-17

MATRIX: W

%SOLIDS: 0

| CAS       | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | BAJ     | 11/04/17 21:49 | 171104-5       | 1715461          |
| 7440-38-2 | Arsenic    | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-39-3 | Barium     | 29.5   | ug/L  |      | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-43-9 | Cadmium    | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-70-2 | Calcium    | 19100  | ug/L  |      | 50    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-47-3 | Chromium   | 42.4   | ug/L  |      | 3     | 10  | 10   | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-48-4 | Cobalt     | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7439-95-4 | Magnesium  | 5240   | ug/L  |      | 110   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7439-98-7 | Molybdenum | 0.861  | ug/L  |      | 0.2   | 0.5 | 0.5  | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-02-0 | Nickel     | 1.29   | ug/L  | J    | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-09-7 | Potassium  | 1160   | ug/L  |      | 50    | 150 | 150  | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7782-49-2 | Selenium   | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7631-86-9 | Silica     | 67200  | ug/L  |      | 53    | 213 | 213  | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-22-4 | Silver     | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-23-5 | Sodium     | 10300  | ug/L  | E    | 100   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-24-6 | Strontium  | 79     | ug/L  | E    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-28-0 | Thallium   | 0.60   | ug/L  | U    | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-61-1 | Uranium    | 0.677  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | BAJ     | 11/04/17 18:02 | 171104-2       | 1715461          |
| 7440-62-2 | Vanadium   | 4.58   | ug/L  | J    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:49 | 112817-1       | 1715448          |



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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436850001**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147640**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|     | Hardness as CaCO3 | 69.2   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | TXT1    | 11/29/17 16:09 |                | 1722509          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1715448          | 1715447    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1715461          | 1715460    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850002**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147655**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 10:44 | 111717W4-6     | 1719595          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

AV EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850003**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147641**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 10:46 | 111717W4-6     | 1719595          |

**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 2018-656

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436850003

BASIS: As Received

DATE COLLECTED 31-OCT-17

CLIENT ID: CAMO-18-147641

LEVEL: Low

DATE RECEIVED 02-NOV-17

MATRIX: W

%SOLIDS: 0

| CAS       | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | BAJ     | 11/04/17 21:54 | 171104-5       | 1715461          |
| 7440-38-2 | Arsenic    | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-39-3 | Barium     | 30.1   | ug/L  |      | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-43-9 | Cadmium    | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-70-2 | Calcium    | 19100  | ug/L  |      | 50    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-47-3 | Chromium   | 42.3   | ug/L  |      | 3     | 10  | 10   | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-48-4 | Cobalt     | 1.3    | ug/L  | J    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7439-95-4 | Magnesium  | 5310   | ug/L  |      | 110   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7439-98-7 | Molybdenum | 0.799  | ug/L  |      | 0.2   | 0.5 | 0.5  | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-02-0 | Nickel     | 2.28   | ug/L  |      | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-09-7 | Potassium  | 1230   | ug/L  |      | 50    | 150 | 150  | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7782-49-2 | Selenium   | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7631-86-9 | Silica     | 67100  | ug/L  |      | 53    | 213 | 213  | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-22-4 | Silver     | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-23-5 | Sodium     | 10200  | ug/L  | E    | 100   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-24-6 | Strontium  | 78.3   | ug/L  | E    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-28-0 | Thallium   | 0.60   | ug/L  | U    | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-61-1 | Uranium    | 0.580  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | BAJ     | 11/04/17 18:18 | 171104-2       | 1715461          |
| 7440-62-2 | Vanadium   | 4.78   | ug/L  | J    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |
| 7440-66-6 | Zinc       | 6.02   | ug/L  | J    | 3.3   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 20:59 | 112817-1       | 1715448          |

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436850003**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147641**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|     | Hardness as CaCO3 | 69.6   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | TXT1    | 11/29/17 16:09 |                | 1722509          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1715448          | 1715447    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1715461          | 1715460    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850004**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147656**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 15:21 | 111717W4-6     | 1719595          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

AV EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850005**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147681**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 15:22 | 111717W4-6     | 1719595          |



**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 2018-656

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436850005

BASIS: As Received

DATE COLLECTED 31-OCT-17

CLIENT ID: CAMO-18-147681

LEVEL: Low

DATE RECEIVED 02-NOV-17

MATRIX: W

%SOLIDS: 0

| CAS       | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | BAJ     | 11/04/17 21:56 | 171104-5       | 1715461          |
| 7440-38-2 | Arsenic    | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-39-3 | Barium     | 30.3   | ug/L  |      | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-42-8 | Boron      | 15.1   | ug/L  | J    | 15    | 50  | 50   | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-43-9 | Cadmium    | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-70-2 | Calcium    | 19700  | ug/L  |      | 50    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-47-3 | Chromium   | 42.5   | ug/L  |      | 3     | 10  | 10   | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-48-4 | Cobalt     | 1.1    | ug/L  | J    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7439-95-4 | Magnesium  | 5390   | ug/L  |      | 110   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7439-98-7 | Molybdenum | 0.949  | ug/L  |      | 0.2   | 0.5 | 0.5  | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-02-0 | Nickel     | 1.3    | ug/L  | J    | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-09-7 | Potassium  | 1300   | ug/L  |      | 50    | 150 | 150  | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7782-49-2 | Selenium   | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7631-86-9 | Silica     | 68900  | ug/L  |      | 53    | 213 | 213  | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-22-4 | Silver     | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-23-5 | Sodium     | 10600  | ug/L  | E    | 100   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-24-6 | Strontium  | 81.5   | ug/L  | E    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-28-0 | Thallium   | 0.60   | ug/L  | U    | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-61-1 | Uranium    | 0.697  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | BAJ     | 11/04/17 18:22 | 171104-2       | 1715461          |
| 7440-62-2 | Vanadium   | 4.83   | ug/L  | J    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:02 | 112817-1       | 1715448          |

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436850005**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147681**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|     | Hardness as CaCO3 | 71.3   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | TXT1    | 11/29/17 16:09 |                | 1722509          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1715448          | 1715447    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1715461          | 1715460    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850006**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147685**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 15:24 | 111717W4-6     | 1719595          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

AV      EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850007**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147647**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 15:26 | 111717W4-6     | 1719595          |

**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 2018-656

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436850007

BASIS: As Received

DATE COLLECTED 31-OCT-17

CLIENT ID: CAMO-18-147647

LEVEL: Low

DATE RECEIVED 02-NOV-17

MATRIX: W

%SOLIDS: 0

| CAS       | Analyte    | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|------------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7429-90-5 | Aluminum   | 68     | ug/L  | U    | 68    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-36-0 | Antimony   | 1      | ug/L  | U    | 1     | 3   | 3    | 1  | MS | BAJ     | 11/04/17 21:57 | 171104-5       | 1715461          |
| 7440-38-2 | Arsenic    | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-39-3 | Barium     | 17.9   | ug/L  |      | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-41-7 | Beryllium  | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-42-8 | Boron      | 15     | ug/L  | U    | 15    | 50  | 50   | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-43-9 | Cadmium    | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-70-2 | Calcium    | 12600  | ug/L  |      | 50    | 200 | 200  | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-47-3 | Chromium   | 20.7   | ug/L  |      | 3     | 10  | 10   | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-48-4 | Cobalt     | 1      | ug/L  | U    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-50-8 | Copper     | 3      | ug/L  | U    | 3     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7439-89-6 | Iron       | 30     | ug/L  | U    | 30    | 100 | 100  | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7439-92-1 | Lead       | 0.50   | ug/L  | U    | 0.5   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7439-95-4 | Magnesium  | 3850   | ug/L  |      | 110   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7439-96-5 | Manganese  | 2      | ug/L  | U    | 2     | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7439-98-7 | Molybdenum | 1.34   | ug/L  |      | 0.2   | 0.5 | 0.5  | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-02-0 | Nickel     | 0.60   | ug/L  | U    | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-09-7 | Potassium  | 2800   | ug/L  |      | 50    | 150 | 150  | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7782-49-2 | Selenium   | 2      | ug/L  | U    | 2     | 5   | 5    | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7631-86-9 | Silica     | 64700  | ug/L  |      | 53    | 213 | 213  | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-22-4 | Silver     | 0.30   | ug/L  | U    | 0.3   | 1   | 1    | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-23-5 | Sodium     | 9990   | ug/L  | E    | 100   | 300 | 300  | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-24-6 | Strontium  | 52.9   | ug/L  | E    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-28-0 | Thallium   | 0.60   | ug/L  | U    | 0.6   | 2   | 2    | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-31-5 | Tin        | 2.5    | ug/L  | U    | 2.5   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-61-1 | Uranium    | 0.272  | ug/L  |      | 0.067 | 0.2 | 0.2  | 1  | MS | BAJ     | 11/04/17 18:25 | 171104-2       | 1715461          |
| 7440-62-2 | Vanadium   | 4.66   | ug/L  | J    | 1     | 5   | 5    | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |
| 7440-66-6 | Zinc       | 3.3    | ug/L  | U    | 3.3   | 10  | 10   | 1  | P  | JWJ     | 11/28/17 21:05 | 112817-1       | 1715448          |

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436850007**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147647**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS | Analyte           | Result | Units | Qual | MDL   | PQL  | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----|-------------------|--------|-------|------|-------|------|------|----|----|---------|----------------|----------------|------------------|
|     | Hardness as CaCO3 | 47.3   | mg/L  |      | 0.453 | 1.24 | 1.24 | 1  |    | TXT1    | 11/29/17 16:09 |                | 1722509          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1715448          | 1715447    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1715461          | 1715460    | SW846 3005A          | 50               | mL    | 50             | mL    | 11/02/17 | JXM8    |
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

**P** SW846 3005A/6010C  
**MS** SW846 3005A/6020A  
**AV** EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436850008**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147662**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte | Result | Units | Qual | MDL   | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|---------|--------|-------|------|-------|-----|------|----|----|---------|----------------|----------------|------------------|
| 7439-97-6 | Mercury | 0.067  | ug/L  | U    | 0.067 | 0.2 | 0.2  | 1  | AV | MTM1    | 11/17/17 15:27 | 111717W4-6     | 1719595          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method          | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|----------------------|------------------|-------|----------------|-------|----------|---------|
| 1719595          | 1719592    | EPA 245.1/245.2 Prep | 20               | mL    | 20             | mL    | 11/16/17 | AXS5    |

**\*Analytical Methods:**

AV      EPA 245.2 1974

# **Quality Control Summary**



**METALS**  
**-3b-**  
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2018-656  
**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> |
|------------------|----------------|---------------|--------------|--------------------------|------------------|-----------|------------|------------|
| 1203911106       | 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      | 50            | ug/L         | +/-150                   | U                | 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         |
|                  | Calcium        | 50            | ug/L         | +/-200                   | U                | P         | 50         | 200        |
|                  | Boron          | 15            | ug/L         | +/-50                    | U                | P         | 15         | 50         |
|                  | Beryllium      | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Barium         | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Aluminum       | 68            | ug/L         | +/-200                   | U                | P         | 68         | 200        |
|                  | Cobalt         | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Vanadium       | 1             | ug/L         | +/-5                     | U                | P         | 1          | 5          |
|                  | Zinc           | 3.3           | ug/L         | +/-10                    | U                | P         | 3.3        | 10         |
| 1203911137       | Antimony       | 1             | ug/L         | +/-3                     | U                | MS        | 1          | 3          |
|                  | Arsenic        | 2             | ug/L         | +/-5                     | U                | MS        | 2          | 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     | 0.2           | ug/L         | +/-0.5                   | U                | MS        | 0.2        | 0.5        |
|                  | Nickel         | 0.6           | ug/L         | +/-2                     | U                | MS        | 0.6        | 2          |
|                  | Selenium       | 2             | ug/L         | +/-5                     | U                | MS        | 2          | 5          |
|                  | Silver         | 0.3           | ug/L         | +/-1                     | U                | MS        | 0.3        | 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        |
| 1203921492       | Mercury        | 0.067         | ug/L         | +/-0.2                   | U                | 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. 2018-656 Client ID CAMO-18-147640S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 436850001 Spike ID: 1203911109

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance<br/>Limit</u> | <u>Spiked<br/>Result</u> | <u>C</u> | <u>Sample<br/>Result</u> | <u>C</u> | <u>Spike<br/>Added</u> | <u>%<br/>Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Strontium      | ug/L         | 75-125                      | 559                      |          | 79                       |          | 500                    | 95.9                  |             | P         |
| Tin            | ug/L         | 75-125                      | 488                      |          | 2.5                      | U        | 500                    | 97.3                  |             | P         |
| Vanadium       | ug/L         | 75-125                      | 478                      |          | 4.58                     | J        | 500                    | 94.7                  |             | P         |
| Zinc           | ug/L         | 75-125                      | 459                      |          | 3.3                      | U        | 500                    | 91.3                  |             | P         |
| Aluminum       | ug/L         | 75-125                      | 5090                     |          | 68                       | U        | 5000                   | 102                   |             | P         |
| Barium         | ug/L         | 75-125                      | 515                      |          | 29.5                     |          | 500                    | 97                    |             | P         |
| Beryllium      | ug/L         | 75-125                      | 491                      |          | 1                        | U        | 500                    | 98.1                  |             | P         |
| Boron          | ug/L         | 75-125                      | 502                      |          | 15                       | U        | 500                    | 97.4                  |             | P         |
| Calcium        | ug/L         | 75-125                      | 23500                    |          | 19100                    |          | 5000                   | 87.8                  |             | P         |
| Cobalt         | ug/L         | 75-125                      | 496                      |          | 1                        | U        | 500                    | 99.1                  |             | P         |
| Copper         | ug/L         | 75-125                      | 480                      |          | 3                        | U        | 500                    | 95.7                  |             | P         |
| Iron           | ug/L         | 75-125                      | 5100                     |          | 30                       | U        | 5000                   | 102                   |             | P         |
| Magnesium      | ug/L         | 75-125                      | 10200                    |          | 5240                     |          | 5000                   | 100                   |             | P         |
| Manganese      | ug/L         | 75-125                      | 472                      |          | 2                        | U        | 500                    | 94.4                  |             | P         |
| Potassium      | ug/L         | 75-125                      | 5960                     |          | 1160                     |          | 5000                   | 96                    |             | P         |
| Silica         | ug/L         |                             | 74400                    |          | 67200                    |          | 10700                  | 68.1                  | N/A         | P         |
| Sodium         | ug/L         | 75-125                      | 14500                    |          | 10300                    |          | 5000                   | 85.1                  |             | P         |

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2018-656 **Client ID:** CAMO-18-147640S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 436850001 **Spike ID:** 1203911140

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance<br/>Limit</u> | <u>Spiked<br/>Result</u> | <u>C</u> | <u>Sample<br/>Result</u> | <u>C</u> | <u>Spike<br/>Added</u> | <u>%<br/>Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Antimony       | ug/L         | 75-125                      | 46.8                     |          | 1                        | U        | 50                     | 93.2                  |             | MS        |
| Arsenic        | ug/L         | 75-125                      | 46.6                     |          | 2                        | U        | 50                     | 91                    |             | MS        |
| Cadmium        | ug/L         | 75-125                      | 46.6                     |          | 0.3                      | U        | 50                     | 93.3                  |             | MS        |
| Chromium       | ug/L         | 75-125                      | 86.6                     |          | 42.4                     |          | 50                     | 88.5                  |             | MS        |
| Lead           | ug/L         | 75-125                      | 46.1                     |          | 0.5                      | U        | 50                     | 92.2                  |             | MS        |
| Molybdenum     | ug/L         | 75-125                      | 49.5                     |          | 0.861                    |          | 50                     | 97.3                  |             | MS        |
| Nickel         | ug/L         | 75-125                      | 45                       |          | 1.29                     | J        | 50                     | 87.3                  |             | MS        |
| Selenium       | ug/L         | 75-125                      | 48.7                     |          | 2                        | U        | 50                     | 94.4                  |             | MS        |
| Silver         | ug/L         | 75-125                      | 48                       |          | 0.3                      | U        | 50                     | 95.9                  |             | MS        |
| Thallium       | ug/L         | 75-125                      | 44.7                     |          | 0.6                      | U        | 50                     | 89.3                  |             | MS        |
| Uranium        | ug/L         | 75-125                      | 46.1                     |          | 0.677                    |          | 50                     | 90.8                  |             | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2018-656 **Client ID:** CAMO-18-147640S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 436850001 **Spike ID:** 1203921495

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance<br/>Limit</u> | <u>Spiked<br/>Result</u> | <u>C</u> | <u>Sample<br/>Result</u> | <u>C</u> | <u>Spike<br/>Added</u> | <u>%<br/>Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Mercury        | ug/L         | 75-125                      | 2.11                     |          | 0.067                    | U        | 2                      | 106                   |             | AV        |

## \*Analytical Methods:

AV EPA 245.1/245.2

**Metals**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 2018-656

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-147640D

Matrix: WATER

Level: Low

Sample ID: 436850001

Duplicate ID: 1203911108

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%           | 29.5          |   | 30.6             |   | 3.69 |      | P  |
| Beryllium | ug/L  |                  | 1 U           |   | 1 U              |   |      |      | P  |
| Boron     | ug/L  |                  | 15 U          |   | 15.4 J           |   | 200  |      | P  |
| Calcium   | ug/L  | +/-20%           | 19100         |   | 20000            |   | 4.9  |      | 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%           | 5240          |   | 5460             |   | 4.21 |      | P  |
| Manganese | ug/L  |                  | 2 U           |   | 2 U              |   |      |      | P  |
| Potassium | ug/L  | +/-20%           | 1160          |   | 1250             |   | 7.09 |      | P  |
| Silica    | ug/L  | +/-20%           | 67200         |   | 70600            |   | 5    |      | P  |
| Sodium    | ug/L  | +/-20%           | 10300         |   | 10800            |   | 4.62 |      | P  |
| Strontium | ug/L  | +/-20%           | 79            |   | 83.1             |   | 5.06 |      | P  |
| Tin       | ug/L  |                  | 2.5 U         |   | 2.5 U            |   |      |      | P  |
| Vanadium  | ug/L  | +/-5             | 4.58 J        |   | 4.82 J           |   | 5.21 |      | P  |
| Zinc      | ug/L  |                  | 3.3 U         |   | 3.3 U            |   |      |      | P  |

\*Analytical Methods:

P SW846 3005A/6010C

**Metals**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 2018-656

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-147640D

Matrix: WATER

Level: Low

Sample ID: 436850001

Duplicate ID: 1203911139

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  |                  | 2 U           |   | 2 U              |   |      |      | MS |
| Cadmium    | ug/L  |                  | 0.3 U         |   | 0.3 U            |   |      |      | MS |
| Chromium   | ug/L  | +/-10            | 42.4          |   | 42.2             |   | .513 |      | MS |
| Lead       | ug/L  |                  | 0.5 U         |   | 0.5 U            |   |      |      | MS |
| Molybdenum | ug/L  | +/- .5           | 0.861         |   | 0.815            |   | 5.49 |      | MS |
| Nickel     | ug/L  | +/-2             | 1.29 J        |   | 1.27 J           |   | 1.64 |      | MS |
| Selenium   | ug/L  |                  | 2 U           |   | 2 U              |   |      |      | MS |
| Silver     | ug/L  |                  | 0.3 U         |   | 0.3 U            |   |      |      | MS |
| Thallium   | ug/L  |                  | 0.6 U         |   | 0.6 U            |   |      |      | MS |
| Uranium    | ug/L  | +/- .2           | 0.677         |   | 0.669            |   | 1.19 |      | MS |

\*Analytical Methods:

MS SW846 3005A/6020A

**Metals**  
**–6–**  
**Duplicate Sample Summary**

**SDG No.:** 2018–656**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–18–147640D**Matrix:** WATER**Level:** Low**Sample ID:** 436850001**Duplicate ID:** 1203921494**Percent Solids for Dup:** N/A

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

\*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2018-656

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203911107       |                |              |                   |               |          |                   |                         |           |
|                  | Aluminum       | ug/L         | 5000              | 5090          |          | 102               | 80-120                  | P         |
|                  | Barium         | ug/L         | 500               | 486           |          | 97.1              | 80-120                  | P         |
|                  | Beryllium      | ug/L         | 500               | 484           |          | 96.7              | 80-120                  | P         |
|                  | Boron          | ug/L         | 500               | 463           |          | 92.6              | 80-120                  | P         |
|                  | Calcium        | ug/L         | 5000              | 5150          |          | 103               | 80-120                  | P         |
|                  | Cobalt         | ug/L         | 500               | 502           |          | 100               | 80-120                  | P         |
|                  | Copper         | ug/L         | 500               | 486           |          | 97.2              | 80-120                  | P         |
|                  | Iron           | ug/L         | 5000              | 5130          |          | 103               | 80-120                  | P         |
|                  | Magnesium      | ug/L         | 5000              | 5230          |          | 105               | 80-120                  | P         |
|                  | Manganese      | ug/L         | 500               | 488           |          | 97.5              | 80-120                  | P         |
|                  | Potassium      | ug/L         | 5000              | 4780          |          | 95.6              | 80-120                  | P         |
|                  | Silica         | ug/L         | 10700             | 9910          |          | 92.6              | 80-120                  | P         |
|                  | Sodium         | ug/L         | 5000              | 4660          |          | 93.1              | 80-120                  | P         |
|                  | Strontium      | ug/L         | 500               | 475           |          | 95.1              | 80-120                  | P         |
|                  | Tin            | ug/L         | 500               | 499           |          | 99.8              | 80-120                  | P         |
|                  | Vanadium       | ug/L         | 500               | 480           |          | 96                | 80-120                  | P         |
|                  | Zinc           | ug/L         | 500               | 462           |          | 92.3              | 80-120                  | P         |

## \*Analytical Methods:

P SW846 3005A/6010C



## METALS

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## Laboratory Control Sample Summary

SDG NO. 2018-656

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203911138       |                |              |                   |               |          |                   |                         |           |
|                  | Antimony       | ug/L         | 50                | 48.1          |          | 96.1              | 80-120                  | MS        |
|                  | Arsenic        | ug/L         | 50                | 49.7          |          | 99.4              | 80-120                  | MS        |
|                  | Cadmium        | ug/L         | 50                | 48.3          |          | 96.5              | 80-120                  | MS        |
|                  | Chromium       | ug/L         | 50                | 48.1          |          | 96.3              | 80-120                  | MS        |
|                  | Lead           | ug/L         | 50                | 47.5          |          | 95                | 80-120                  | MS        |
|                  | Molybdenum     | ug/L         | 50                | 47.3          |          | 94.5              | 80-120                  | MS        |
|                  | Nickel         | ug/L         | 50                | 47.4          |          | 94.9              | 80-120                  | MS        |
|                  | Selenium       | ug/L         | 50                | 51.5          |          | 103               | 80-120                  | MS        |
|                  | Silver         | ug/L         | 50                | 49.8          |          | 99.5              | 80-120                  | MS        |
|                  | Thallium       | ug/L         | 50                | 46.4          |          | 92.8              | 80-120                  | MS        |
|                  | Uranium        | ug/L         | 50                | 46.6          |          | 93.1              | 80-120                  | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2018-656

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203921493       | Mercury        | ug/L         | 2                 | 2.11          |          | 106               | 85-115                  | AV        |

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2018-656

Client ID: CAMO-18-147640L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 436850001

Serial Dilution ID: 1203911110

| <u>Analyte</u> | <u>Initial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>Serial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>%<br/>Difference</u> | <u>Qual</u> | <u>Acceptance<br/>Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Aluminum       | 68                                | U        | 340                              | U        |                         |             |                             | P         |
| Barium         | 29.5                              |          | 32.4                             |          | 9.77                    |             |                             | P         |
| Beryllium      | 1                                 | U        | 5                                | U        |                         |             |                             | P         |
| Boron          | 15                                | U        | 75                               | U        |                         |             |                             | P         |
| Calcium        | 19100                             |          | 21000                            |          | 9.898                   |             | 10                          | P         |
| Cobalt         | 1                                 | U        | 5.33                             | J        |                         |             |                             | P         |
| Copper         | 3                                 | U        | 15                               | U        |                         |             |                             | P         |
| Iron           | 30                                | U        | 150                              | U        |                         |             |                             | P         |
| Magnesium      | 5240                              |          | 5660                             |          | 8.062                   |             |                             | P         |
| Manganese      | 2                                 | U        | 10                               | U        |                         |             |                             | P         |
| Potassium      | 1160                              |          | 1460                             |          | 25.458                  |             |                             | P         |
| Silica         | 67200                             |          | 71400                            |          | 6.378                   |             | 10                          | P         |
| Sodium         | 10300                             |          | 11400                            |          | 10.821                  | E           | 10                          | P         |
| Strontium      | 79                                |          | 89.2                             |          | 12.844                  | E           | 10                          | P         |
| Tin            | 2.5                               | U        | 12.5                             | U        |                         |             |                             | P         |
| Vanadium       | 4.58                              | J        | 5                                | U        | 5.972                   |             |                             | P         |
| Zinc           | 3.3                               | U        | 16.5                             | U        |                         |             |                             | P         |

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2018-656

Client ID: CAMO-18-147640L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 436850001

Serial Dilution ID: 1203911141

| <u>Analyte</u> | <u>Initial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>Serial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>%<br/>Difference</u> | <u>Qual</u> | <u>Acceptance<br/>Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Antimony       | 1                                 | U        | 5                                | U        |                         |             |                             | MS        |
| Arsenic        | 2                                 | U        | 10                               | U        |                         |             |                             | MS        |
| Cadmium        | .3                                | U        | 1.5                              | U        |                         |             |                             | MS        |
| Chromium       | 42.4                              |          | 43.5                             | J        | 2.74                    |             |                             | MS        |
| Lead           | .5                                | U        | 2.5                              | U        |                         |             |                             | MS        |
| Molybdenum     | .861                              |          | 1                                | U        | 7.433                   |             |                             | MS        |
| Nickel         | 1.29                              | J        | 3                                | U        | 22.196                  |             |                             | MS        |
| Selenium       | 2                                 | U        | 10                               | U        |                         |             |                             | MS        |
| Silver         | .3                                | U        | 1.5                              | U        |                         |             |                             | MS        |
| Thallium       | .6                                | U        | 3                                | U        |                         |             |                             | MS        |
| Uranium        | .677                              |          | .76                              | J        | 12.26                   |             |                             | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

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## Serial Dilution Sample Summary

**SDG NO.** 2018-656 **Client ID:** CAMO-18-147640L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 436850001 **Serial Dilution ID:** 1203921496

| <u>Analyte</u> | <u>Initial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>Serial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>%<br/>Difference</u> | <u>Qual</u> | <u>Acceptance<br/>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 #: 2018-656  
Work Order #: 436850**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1716073

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                  |
|------------------|---------------------------------------------------|
| 436850002        | CAMO-18-147655                                    |
| 436850004        | CAMO-18-147656                                    |
| 436850006        | CAMO-18-147685                                    |
| 436850008        | CAMO-18-147662                                    |
| 1203912655       | Method Blank (MB)                                 |
| 1203912656       | Laboratory Control Sample (LCS)                   |
| 1203912658       | 436983003(CrIN6-18-148623) Sample Duplicate (DUP) |
| 1203912660       | 436983003(CrIN6-18-148623) 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# 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 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 436983003 (CrIN6-18-148623) 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****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**

|                          |                          |                |           |
|--------------------------|--------------------------|----------------|-----------|
| <b>Product:</b>          | <b>Cyanide and Total</b> |                |           |
| <b>Analytical Batch:</b> | 1715405                  | <b>Method:</b> | WSP-CN(T) |
| <b>Prep Batch :</b>      | 1715404                  | <b>Method:</b> | EPA 335.4 |

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                       |
|------------------|--------------------------------------------------------|
| 436850002        | CAMO-18-147655                                         |
| 436850004        | CAMO-18-147656                                         |
| 436850006        | CAMO-18-147685                                         |
| 436850008        | CAMO-18-147662                                         |
| 1203911001       | Method Blank (MB)                                      |
| 1203911002       | Laboratory Control Sample (LCS)                        |
| 1203911003       | 436850002(CAMO-18-147655) Sample Duplicate (DUP)       |
| 1203911004       | 436850002(CAMO-18-147655) Matrix Spike (MS)            |
| 1203914659       | 436850002(CAMO-18-147655) Matrix Spike Duplicate (MSD) |

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# 21.

### **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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 436850002 (CAMO-18-147655) 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.

**MS/MSD Relative Percent Difference (RPD) Statement**

The RPD between the spike and spike duplicate met the acceptance limits.

**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**

**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:** 1715660

**Method:** WSP-ANIONS

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--------------------------------------------------|
| 436850001        | CAMO-18-147640                                   |
| 436850003        | CAMO-18-147641                                   |
| 436850005        | CAMO-18-147681                                   |
| 436850007        | CAMO-18-147647                                   |
| 1203911639       | Method Blank (MB)                                |
| 1203911640       | Laboratory Control Sample (LCS)                  |
| 1203911641       | 436850001(CAMO-18-147640) Sample Duplicate (DUP) |
| 1203911642       | 436850001(CAMO-18-147640) 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 436850001 (CAMO-18-147640) 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****Manual Integrations**

Samples 1203911641 (CAMO-18-147640DUP), 436850001 (CAMO-18-147640), 436850003 (CAMO-18-147641), 436850005 (CAMO-18-147681) and 436850007 (CAMO-18-147647) 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:** 1715525      **Method:** NH3  
**Prep Batch :** 1715524      **Method:** EPA 350.1 Prep

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--------------------------------------------------|
| 436850001        | CAMO-18-147640                                   |
| 436850003        | CAMO-18-147641                                   |
| 436850005        | CAMO-18-147681                                   |
| 436850007        | CAMO-18-147647                                   |
| 1203911273       | Method Blank (MB)                                |
| 1203911274       | Laboratory Control Sample (LCS)                  |
| 1203911275       | 436504001(CAMO-18-147642) Sample Duplicate (DUP) |
| 1203911276       | 436504001(CAMO-18-147642) 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 436504001 (CAMO-18-147642) 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****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**

|                          |                                |                |                |
|--------------------------|--------------------------------|----------------|----------------|
| <b>Product:</b>          | <b>Total Kjeldahl Nitrogen</b> |                |                |
| <b>Analytical Batch:</b> | 1715530                        | <b>Method:</b> | TKN            |
| <b>Prep Batch :</b>      | 1715529                        | <b>Method:</b> | EPA 351.2 Prep |

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--------------------------------------------------|
| 436850002        | CAMO-18-147655                                   |
| 436850004        | CAMO-18-147656                                   |
| 436850006        | CAMO-18-147685                                   |
| 436850008        | CAMO-18-147662                                   |
| 1203911295       | Method Blank (MB)                                |
| 1203911296       | Laboratory Control Sample (LCS)                  |
| 1203911298       | 436850002(CAMO-18-147655) Sample Duplicate (DUP) |
| 1203911300       | 436850002(CAMO-18-147655) 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# 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 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 436850002 (CAMO-18-147655) 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 | 1203911300 (CAMO-18-147655MS) | 85.5* (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 samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

### **Miscellaneous Information**

#### **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:** 1716170

**Method:** NO3NO2

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--------------------------------------------------|
| 436850001        | CAMO-18-147640                                   |
| 436850003        | CAMO-18-147641                                   |
| 436850005        | CAMO-18-147681                                   |
| 436850007        | CAMO-18-147647                                   |
| 1203912901       | Method Blank (MB)                                |
| 1203912902       | Laboratory Control Sample (LCS)                  |
| 1203912903       | 436850001(CAMO-18-147640) Sample Duplicate (DUP) |
| 1203912905       | 436850001(CAMO-18-147640) 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# 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+ 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

##### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

##### **Quality Control (QC) Designation**

Sample 436850001 (CAMO-18-147640) 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 following samples 1203912903 (CAMO-18-147640DUP), 1203912905 (CAMO-18-147640PS), 436850001 (CAMO-18-147640), 436850003 (CAMO-18-147641), 436850005 (CAMO-18-147681) and 436850007 (CAMO-18-147647) 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                   | 436850 |     |     |     |
|---------------------------|--------|-----|-----|-----|
|                           | 001    | 003 | 005 | 007 |
| Nitrogen, Nitrate/Nitrite | 5X     | 10X | 10X | 5X  |

##### **Sample Re-analysis**

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



### **Miscellaneous Information**

#### **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**

|                          |                         |                |                |
|--------------------------|-------------------------|----------------|----------------|
| <b>Product:</b>          | <b>Total Phosphorus</b> |                |                |
| <b>Analytical Batch:</b> | 1715514                 | <b>Method:</b> | PO4            |
| <b>Prep Batch :</b>      | 1715513                 | <b>Method:</b> | EPA 365.4 Prep |

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--------------------------------------------------|
| 436850001        | CAMO-18-147640                                   |
| 436850003        | CAMO-18-147641                                   |
| 436850005        | CAMO-18-147681                                   |
| 436850007        | CAMO-18-147647                                   |
| 1203911255       | Method Blank (MB)                                |
| 1203911256       | Laboratory Control Sample (LCS)                  |
| 1203911257       | 436315001(CAPA-18-147554) Sample Duplicate (DUP) |
| 1203911259       | 436504001(CAMO-18-147642) Sample Duplicate (DUP) |
| 1203911258       | 436315001(CAPA-18-147554) Matrix Spike (MS)      |
| 1203911260       | 436504001(CAMO-18-147642) 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Samples 436315001 (CAPA-18-147554) and 436504001 (CAMO-18-147642) 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 samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information****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:** 1716192

**Method:** TDS

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--------------------------------------------------|
| 436850001        | CAMO-18-147640                                   |
| 436850003        | CAMO-18-147641                                   |
| 436850005        | CAMO-18-147681                                   |
| 436850007        | CAMO-18-147647                                   |
| 1203912966       | Method Blank (MB)                                |
| 1203912967       | Laboratory Control Sample (LCS)                  |
| 1203912969       | 436850005(CAMO-18-147681) 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **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 436850005 (CAMO-18-147681) 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 | 1203912969 (CAMO-18-147681DUP) | 10.9* (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**

##### **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:** Specific Conductivity

**Analytical Batch:** 1717163

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                 |
|------------------|--------------------------------------------------|
| 436850001        | CAMO-18-147640                                   |
| 436850003        | CAMO-18-147641                                   |
| 436850005        | CAMO-18-147681                                   |
| 436850007        | CAMO-18-147647                                   |
| 1203915374       | Laboratory Control Sample (LCS)                  |
| 1203915375       | 436504008(CAPA-18-147571) 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# 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 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 436504008 (CAPA-18-147571) 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****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:** 1716544 **Method:** PH

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                  |
|------------------|---------------------------------------------------|
| 436850001        | CAMO-18-147640                                    |
| 436850003        | CAMO-18-147641                                    |
| 436850005        | CAMO-18-147681                                    |
| 436850007        | CAMO-18-147647                                    |
| 1203913923       | Laboratory Control Sample (LCS)                   |
| 1203913924       | 436689001(CAMO-18-147638) Sample Duplicate (DUP)  |
| 1203913925       | 436983004(CrIN6-18-148630) 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Samples 436689001 (CAMO-18-147638) and 436983004 (CrIN6-18-148630) were 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.

| <b>Sample</b>                   | <b>Analyte</b> | <b>Value</b>                                 |
|---------------------------------|----------------|----------------------------------------------|
| 1203913924 (CAMO-18-147638DUP)  | pH             | Received 01-NOV-17, out of holding 30-OCT-17 |
| 1203913925 (CrIN6-18-148630DUP) | pH             | Received 03-NOV-17, out of holding 01-NOV-17 |
| 436850001 (CAMO-18-147640)      | pH             | Received 02-NOV-17, out of holding 31-OCT-17 |
| 436850003 (CAMO-18-147641)      | pH             | Received 02-NOV-17, out of holding 31-OCT-17 |
| 436850005 (CAMO-18-147681)      | pH             | Received 02-NOV-17, out of holding 31-OCT-17 |
| 436850007 (CAMO-18-147647)      | pH             | Received 02-NOV-17, out of holding 31-OCT-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**

##### **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:** 1716537      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

| <b>Sample ID</b> | <b>Client ID</b>                                  |
|------------------|---------------------------------------------------|
| 436850001        | CAMO-18-147640                                    |
| 436850003        | CAMO-18-147641                                    |
| 436850005        | CAMO-18-147681                                    |
| 436850007        | CAMO-18-147647                                    |
| 1203913913       | Laboratory Control Sample (LCS)                   |
| 1203913916       | 436983004(CrIN6-18-148630) Sample Duplicate (DUP) |
| 1203913918       | 436983004(CrIN6-18-148630) 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 Electronic bottle-top 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 Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 436983004 (CrIN6-18-148630) 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**

**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**

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### **Qualifier Definition Report for**

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

Client SDG: 2018-656 GEL Work Order: 436850

#### **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:** 28 NOV 2017

**Title:** Team Leader

# **Sample Data Summary**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147640  
Sample ID: 436850001  
Matrix: W  
Collect Date: 31-OCT-17 11:05  
Receive Date: 02-NOV-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         | 0.071  | 0.067 | 0.200 | mg/L     |      | 1  | MAR1    | 11/04/17 | 0237 | 1715660 | 1      |
| Chloride                                     |           | 6.10   | 0.067 | 0.200 | mg/L     |      | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.223  | 0.033 | 0.100 | mg/L     |      | 1  |         |          |      |         |        |
| Sulfate                                      |           | 9.20   | 0.133 | 0.400 | mg/L     |      | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |      |    |         |          |      |         |        |
| NH3 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Ammonia                            | J         | 0.0269 | 0.017 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/06/17 | 1533 | 1715525 | 2      |
| NO3NO2 "As Received"                         |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 3.15   | 0.085 | 0.250 | mg/L     |      | 5  | AXH3    | 11/07/17 | 0630 | 1716170 | 3      |
| PO4 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Phosphorus, Total as P                       |           | 0.0506 | 0.020 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/07/17 | 1438 | 1715514 | 4      |
| Solids Analysis                              |           |        |       |       |          |      |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 163    | 3.40  | 14.3  | mg/L     |      |    | KLP1    | 11/06/17 | 1253 | 1716192 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |      |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |      |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 66.5   | 1.45  | 4.00  | mg/L     |      |    | RXB5    | 11/10/17 | 1327 | 1716537 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 1.45  | 4.00  | mg/L     |      |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |      |    |         |          |      |         |        |
| Conductivity                                 |           | 228    | 1.00  | 1.00  | umhos/cm |      | 1  | VH1     | 11/14/17 | 1342 | 1717163 | 7      |
| PH "As Received"                             |           |        |       |       |          |      |    |         |          |      |         |        |
| pH at Temp 12.7C                             | H         | 7.94   | 0.010 | 0.100 | SU       |      | 1  | RXB5    | 11/10/17 | 1325 | 1716544 | 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    | 11/06/17 | 0910 | 1715524    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 11/06/17 | 1700 | 1715513    |

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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147640  
Sample ID: 436850001

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



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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147655  
Sample ID: 436850002  
Matrix: W  
Collect Date: 31-OCT-17 11:05  
Receive Date: 02-NOV-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| 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         | 0.875  | 0.330 | 1.00  | mg/L  |      | 1  | TSM     | 11/07/17 | 2007 | 1716073 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |      |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |      |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1.00 | 1  | AXH3    | 11/08/17 | 0659 | 1715405 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |      |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |      |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | J         | 0.070  | 0.033 | 0.100 | mg/L  | 1.00 | 1  | KLP1    | 11/09/17 | 1349 | 1715530 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|----------------------------------------|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 11/08/17 | 0634 | 1715404    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1    | 11/08/17 | 1700 | 1715529    |

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 |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147641  
Sample ID: 436850003  
Matrix: W  
Collect Date: 31-OCT-17 12:56  
Receive Date: 02-NOV-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         | 0.0677 | 0.067 | 0.200 | mg/L     |      | 1  | MAR1    | 11/04/17 | 0404 | 1715660 | 1      |
| Chloride                                     |           | 6.00   | 0.067 | 0.200 | mg/L     |      | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.250  | 0.033 | 0.100 | mg/L     |      | 1  |         |          |      |         |        |
| Sulfate                                      |           | 9.01   | 0.133 | 0.400 | mg/L     |      | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |      |    |         |          |      |         |        |
| NH3 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Ammonia                            | J         | 0.0446 | 0.017 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/06/17 | 1534 | 1715525 | 2      |
| NO3NO2 "As Received"                         |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 3.02   | 0.170 | 0.500 | mg/L     |      | 10 | AXH3    | 11/07/17 | 0633 | 1716170 | 3      |
| PO4 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Phosphorus, Total as P                       | J         | 0.0492 | 0.020 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/07/17 | 1439 | 1715514 | 4      |
| Solids Analysis                              |           |        |       |       |          |      |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 164    | 3.40  | 14.3  | mg/L     |      |    | KLP1    | 11/06/17 | 1253 | 1716192 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |      |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |      |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 71.0   | 1.45  | 4.00  | mg/L     |      |    | RXB5    | 11/10/17 | 1329 | 1716537 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 1.45  | 4.00  | mg/L     |      |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |      |    |         |          |      |         |        |
| Conductivity                                 |           | 232    | 1.00  | 1.00  | umhos/cm |      | 1  | VH1     | 11/14/17 | 1342 | 1717163 | 7      |
| PH "As Received"                             |           |        |       |       |          |      |    |         |          |      |         |        |
| pH at Temp 13.5C                             | H         | 8.06   | 0.010 | 0.100 | SU       |      | 1  | RXB5    | 11/10/17 | 1327 | 1716544 | 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    | 11/06/17 | 0910 | 1715524    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 11/06/17 | 1700 | 1715513    |

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147641  
Sample ID: 436850003

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

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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-656

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-147656

Project: ESHL00114

Sample ID: 436850004

Client ID: ARSL004

Matrix: W

Collect Date: 31-OCT-17 12:56

Receive Date: 02-NOV-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               | U         | ND     | 0.330 | 1.00  | mg/L  |      | 1  | TSM     | 11/07/17 | 2054 | 1716073 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |      |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |      |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1.00 | 1  | AXH3    | 11/08/17 | 0703 | 1715405 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |      |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |      |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | J         | 0.0589 | 0.033 | 0.100 | mg/L  | 1.00 | 1  | KLP1    | 11/09/17 | 1352 | 1715530 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|----------------------------------------|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 11/08/17 | 0634 | 1715404    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1    | 11/08/17 | 1700 | 1715529    |

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

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

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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147681  
Sample ID: 436850005  
Matrix: W  
Collect Date: 31-OCT-17 11:05  
Receive Date: 02-NOV-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         | 0.0776 | 0.067 | 0.200 | mg/L     |      | 1  | MAR1    | 11/04/17 | 0433 | 1715660 | 1      |
| Chloride                                     |           | 6.18   | 0.067 | 0.200 | mg/L     |      | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.276  | 0.033 | 0.100 | mg/L     |      | 1  |         |          |      |         |        |
| Sulfate                                      |           | 9.25   | 0.133 | 0.400 | mg/L     |      | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |      |    |         |          |      |         |        |
| NH3 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Ammonia                            | J         | 0.0238 | 0.017 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/06/17 | 1534 | 1715525 | 2      |
| NO3NO2 "As Received"                         |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 3.01   | 0.170 | 0.500 | mg/L     |      | 10 | AXH3    | 11/07/17 | 0635 | 1716170 | 3      |
| PO4 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Phosphorus, Total as P                       |           | 0.0708 | 0.020 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/07/17 | 1445 | 1715514 | 4      |
| Solids Analysis                              |           |        |       |       |          |      |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 156    | 3.40  | 14.3  | mg/L     |      |    | KLP1    | 11/06/17 | 1253 | 1716192 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |      |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |      |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 66.7   | 1.45  | 4.00  | mg/L     |      |    | RXB5    | 11/10/17 | 1331 | 1716537 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 1.45  | 4.00  | mg/L     |      |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |      |    |         |          |      |         |        |
| Conductivity                                 |           | 225    | 1.00  | 1.00  | umhos/cm |      | 1  | VH1     | 11/14/17 | 1344 | 1717163 | 7      |
| PH "As Received"                             |           |        |       |       |          |      |    |         |          |      |         |        |
| pH at Temp 12.8C                             | H         | 7.93   | 0.010 | 0.100 | SU       |      | 1  | RXB5    | 11/10/17 | 1329 | 1716544 | 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    | 11/06/17 | 0910 | 1715524    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 11/06/17 | 1700 | 1715513    |

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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147681  
Sample ID: 436850005

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                   | 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: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147685  
Sample ID: 436850006  
Matrix: W  
Collect Date: 31-OCT-17 11:05  
Receive Date: 02-NOV-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

| 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         | 0.821  | 0.330 | 1.00  | mg/L  |      | 1  | TSM     | 11/07/17 | 2141 | 1716073 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |      |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |      |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1.00 | 1  | AXH3    | 11/08/17 | 0704 | 1715405 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |      |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |      |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | J         | 0.0629 | 0.033 | 0.100 | mg/L  | 1.00 | 1  | KLP1    | 11/09/17 | 1353 | 1715530 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|----------------------------------------|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 11/08/17 | 0634 | 1715404    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1    | 11/08/17 | 1700 | 1715529    |

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: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147647  
Sample ID: 436850007  
Matrix: W  
Collect Date: 31-OCT-17 14:52  
Receive Date: 02-NOV-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                                      | U         | ND     | 0.067 | 0.200 | mg/L     |      | 1  | MAR1    | 11/04/17 | 0501 | 1715660 | 1      |
| Chloride                                     |           | 3.20   | 0.067 | 0.200 | mg/L     |      | 1  |         |          |      |         |        |
| Fluoride                                     |           | 0.272  | 0.033 | 0.100 | mg/L     |      | 1  |         |          |      |         |        |
| Sulfate                                      |           | 5.52   | 0.133 | 0.400 | mg/L     |      | 1  |         |          |      |         |        |
| Nutrient Analysis                            |           |        |       |       |          |      |    |         |          |      |         |        |
| NH3 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Ammonia                            | J         | 0.0474 | 0.017 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/06/17 | 1535 | 1715525 | 2      |
| NO3NO2 "As Received"                         |           |        |       |       |          |      |    |         |          |      |         |        |
| Nitrogen, Nitrate/Nitrite                    |           | 1.90   | 0.085 | 0.250 | mg/L     |      | 5  | AXH3    | 11/07/17 | 0636 | 1716170 | 3      |
| PO4 "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Phosphorus, Total as P                       |           | 0.581  | 0.020 | 0.050 | mg/L     | 1.00 | 1  | KLP1    | 11/07/17 | 1446 | 1715514 | 4      |
| Solids Analysis                              |           |        |       |       |          |      |    |         |          |      |         |        |
| TDS "As Received"                            |           |        |       |       |          |      |    |         |          |      |         |        |
| Total Dissolved Solids                       |           | 130    | 3.40  | 14.3  | mg/L     |      |    | KLP1    | 11/06/17 | 1253 | 1716192 | 5      |
| Titration and Ion Analysis                   |           |        |       |       |          |      |    |         |          |      |         |        |
| EPA 310.1 Total Alkalinity "As Received"     |           |        |       |       |          |      |    |         |          |      |         |        |
| Alkalinity, Total as CaCO3                   |           | 57.5   | 1.45  | 4.00  | mg/L     |      |    | RXB5    | 11/10/17 | 1333 | 1716537 | 6      |
| Carbonate alkalinity (CaCO3)                 | U         | ND     | 1.45  | 4.00  | mg/L     |      |    |         |          |      |         |        |
| EPA120.1 Specific Conductivity "As Received" |           |        |       |       |          |      |    |         |          |      |         |        |
| Conductivity                                 |           | 177    | 1.00  | 1.00  | umhos/cm |      | 1  | VH1     | 11/14/17 | 1345 | 1717163 | 7      |
| PH "As Received"                             |           |        |       |       |          |      |    |         |          |      |         |        |
| pH at Temp 13.4C                             | H         | 7.71   | 0.010 | 0.100 | SU       |      | 1  | RXB5    | 11/10/17 | 1332 | 1716544 | 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    | 11/06/17 | 0910 | 1715524    |
| EPA 365.4 Prep | EPA 365.4 Phosphorus, Total in liquid PR | KLP1    | 11/06/17 | 1700 | 1715513    |



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## Certificate of Analysis

Report Date: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545  
Contact: Ms. Nita Patel  
Project: LANL- WQH Water Samples

Client SDG: 2018-656

Client Sample ID: CAMO-18-147647  
Sample ID: 436850007

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                   | 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: November 28, 2017

Company : Los Alamos National Laboratory  
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-656

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-147662

Project: ESHL00114

Sample ID: 436850008

Client ID: ARSL004

Matrix: W

Collect Date: 31-OCT-17 14:52

Receive Date: 02-NOV-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         | 0.379  | 0.330 | 1.00  | mg/L  |      | 1  | TSM     | 11/07/17 | 2228 | 1716073 | 1      |
| Flow Injection Analysis                    |           |        |       |       |       |      |    |         |          |      |         |        |
| WSP-CN(T) "As Received"                    |           |        |       |       |       |      |    |         |          |      |         |        |
| Cyanide, Total                             | U         | ND     | 1.67  | 5.00  | ug/L  | 1.00 | 1  | AXH3    | 11/08/17 | 0705 | 1715405 | 2      |
| Nutrient Analysis                          |           |        |       |       |       |      |    |         |          |      |         |        |
| TKN "As Received"                          |           |        |       |       |       |      |    |         |          |      |         |        |
| Nitrogen, Total Kjeldahl                   | J         | 0.0564 | 0.033 | 0.100 | mg/L  | 1.00 | 1  | KLP1    | 11/09/17 | 1354 | 1715530 | 3      |

The following Prep Methods were performed:

| Method         | Description                            | Analyst | Date     | Time | Prep Batch |
|----------------|----------------------------------------|---------|----------|------|------------|
| EPA 335.4      | EPA 335.4 Total Cyanide                | AXH3    | 11/08/17 | 0634 | 1715404    |
| EPA 351.2 Prep | EPA 351.2 Total Kjeldahl Nitrogen Prep | KLP1    | 11/08/17 | 1700 | 1715529    |

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

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**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: November 28, 2017

Page 1 of 6

Los Alamos National Laboratory  
TA-00, SM1237, Rm104C  
Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 436850

| Parmname                       | NOM       | Sample | Qual  | QC   | Units | RPD% | REC% | Range           | Anlst | Date     | Time  |
|--------------------------------|-----------|--------|-------|------|-------|------|------|-----------------|-------|----------|-------|
| <b>Carbon Analysis</b>         |           |        |       |      |       |      |      |                 |       |          |       |
| Batch                          | 1716073   |        |       |      |       |      |      |                 |       |          |       |
| QC1203912658                   | 436983003 | DUP    |       |      |       |      |      |                 |       |          |       |
| Total Organic Carbon Average   |           | J      | 0.944 | 1.02 | mg/L  | 7.93 | ^    | (+/-1.00)       | TSM   | 11/08/17 | 04:43 |
| QC1203912656                   | LCS       |        |       |      |       |      |      |                 |       |          |       |
| Total Organic Carbon Average   | 10.0      |        |       | 9.81 | mg/L  |      |      | 98.1 (80%-120%) |       | 11/07/17 | 17:35 |
| QC1203912655                   | MB        |        |       |      |       |      |      |                 |       |          |       |
| Total Organic Carbon Average   |           |        | U     | ND   | mg/L  |      |      |                 |       | 11/07/17 | 17:24 |
| QC1203912660                   | 436983003 | PS     |       |      |       |      |      |                 |       |          |       |
| Total Organic Carbon Average   | 10.0      | J      | 0.944 | 11.7 | mg/L  |      |      | 108 (75%-125%)  |       | 11/08/17 | 05:30 |
| <b>Flow Injection Analysis</b> |           |        |       |      |       |      |      |                 |       |          |       |
| Batch                          | 1715405   |        |       |      |       |      |      |                 |       |          |       |
| QC1203911003                   | 436850002 | DUP    |       |      |       |      |      |                 |       |          |       |
| Cyanide, Total                 |           | U      | ND    | U    | ND    | ug/L | N/A  |                 | AXH3  | 11/08/17 | 07:00 |
| QC1203911002                   | LCS       |        |       |      |       |      |      |                 |       |          |       |
| Cyanide, Total                 | 50.0      |        |       | 51.3 | ug/L  |      |      | 103 (90%-110%)  |       | 11/08/17 | 06:53 |
| QC1203911001                   | MB        |        |       |      |       |      |      |                 |       |          |       |
| Cyanide, Total                 |           |        | U     | ND   | ug/L  |      |      |                 |       | 11/08/17 | 06:52 |
| QC1203911004                   | 436850002 | MS     |       |      |       |      |      |                 |       |          |       |
| Cyanide, Total                 | 100       | U      | ND    | 98.9 | ug/L  |      |      | 98.9 (90%-110%) |       | 11/08/17 | 07:01 |
| QC1203914659                   | 436850002 | MSD    |       |      |       |      |      |                 |       |          |       |
| Cyanide, Total                 | 100       | U      | ND    | 103  | ug/L  | 4.06 |      | 103 (0%-20%)    |       | 11/08/17 | 07:02 |

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## QC Summary

Workorder: 436850

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| Parmname                  | NOM       | Sample | Qual  | QC | Units | RPD% | REC%  | Range | Anlst      | Date | Time           |
|---------------------------|-----------|--------|-------|----|-------|------|-------|-------|------------|------|----------------|
| <b>Ion Chromatography</b> |           |        |       |    |       |      |       |       |            |      |                |
| Batch                     | 1715660   |        |       |    |       |      |       |       |            |      |                |
| QC1203911641              | 436850001 | DUP    |       |    |       |      |       |       |            |      |                |
| Bromide                   |           | J      | 0.071 | U  | ND    | mg/L | 200   | ^     |            | MAR1 | 11/04/17 03:06 |
| Chloride                  |           |        | 6.10  |    | 6.10  | mg/L | 0.059 |       | (0%-20%)   |      |                |
| Fluoride                  |           |        | 0.223 |    | 0.226 | mg/L | 1.38  | ^     | (+/-0.100) |      |                |
| Sulfate                   |           |        | 9.20  |    | 9.17  | mg/L | 0.336 |       | (0%-20%)   |      |                |
| QC1203911640              | LCS       |        |       |    |       |      |       |       |            |      |                |
| Bromide                   | 1.25      |        |       |    | 1.23  | mg/L |       | 98.2  | (80%-120%) |      | 11/04/17 02:08 |
| Chloride                  | 5.00      |        |       |    | 4.87  | mg/L |       | 97.4  | (80%-120%) |      |                |
| Fluoride                  | 2.50      |        |       |    | 2.58  | mg/L |       | 103   | (80%-120%) |      |                |
| Sulfate                   | 10.0      |        |       |    | 10.0  | mg/L |       | 100   | (80%-120%) |      |                |
| QC1203911639              | MB        |        |       |    |       |      |       |       |            |      |                |
| Bromide                   |           |        | U     |    | ND    | mg/L |       |       |            |      | 11/04/17 01:39 |
| Chloride                  |           |        | U     |    | ND    | mg/L |       |       |            |      |                |
| Fluoride                  |           |        | U     |    | ND    | mg/L |       |       |            |      |                |
| Sulfate                   |           |        | U     |    | ND    | mg/L |       |       |            |      |                |
| QC1203911642              | 436850001 | PS     |       |    |       |      |       |       |            |      |                |
| Bromide                   | 1.25      | J      | 0.071 |    | 1.27  | mg/L |       | 95.7  | (75%-125%) |      | 11/04/17 03:35 |
| Chloride                  | 5.00      |        | 6.10  |    | 11.8  | mg/L |       | 113   | (75%-125%) |      |                |

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## QC Summary

Workorder: 436850

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| Parmname                  | NOM     | Sample | Qual | QC   | Units | RPD% | REC% | Range      | Anlst | Date     | Time  |
|---------------------------|---------|--------|------|------|-------|------|------|------------|-------|----------|-------|
| <b>Ion Chromatography</b> |         |        |      |      |       |      |      |            |       |          |       |
| Batch                     | 1715660 |        |      |      |       |      |      |            |       |          |       |
| Fluoride                  | 2.50    | 0.223  |      | 2.92 | mg/L  |      | 108  | (75%-125%) | MAR1  | 11/04/17 | 03:35 |
| Sulfate                   | 10.0    | 9.20   |      | 19.8 | mg/L  |      | 106  | (75%-125%) |       |          |       |

### Nutrient Analysis

|                        |           |     |        |        |      |      |   |            |      |          |       |
|------------------------|-----------|-----|--------|--------|------|------|---|------------|------|----------|-------|
| Batch                  | 1715514   |     |        |        |      |      |   |            |      |          |       |
| QC1203911257           | 436315001 | DUP |        |        |      |      |   |            |      |          |       |
| Phosphorus, Total as P |           |     | 0.0726 | 0.0601 | mg/L | 18.8 | ^ | (+/-0.050) | KLP1 | 11/07/17 | 14:22 |
| QC1203911259           | 436504001 | DUP |        |        |      |      |   |            |      |          |       |
| Phosphorus, Total as P |           | J   | 0.0278 | 0.0519 | mg/L | 60.5 | ^ | (+/-0.050) |      | 11/07/17 | 14:24 |
| QC1203911256           | LCS       |     |        |        |      |      |   |            |      |          |       |
| Phosphorus, Total as P |           |     | 1.00   | 1.04   | mg/L |      |   | (80%-124%) |      | 11/07/17 | 14:20 |
| QC1203911255           | MB        |     |        |        |      |      |   |            |      |          |       |
| Phosphorus, Total as P |           |     | J      | 0.0231 | mg/L |      |   |            |      | 11/07/17 | 14:19 |
| QC1203911258           | 436315001 | MS  |        |        |      |      |   |            |      |          |       |
| Phosphorus, Total as P |           |     | 1.00   | 0.0726 | mg/L |      |   | (63%-139%) |      | 11/07/17 | 14:23 |
| QC1203911260           | 436504001 | MS  |        |        |      |      |   |            |      |          |       |
| Phosphorus, Total as P |           | J   | 1.00   | 0.0278 | mg/L |      |   | (63%-139%) |      | 11/07/17 | 14:25 |

|                   |           |     |       |   |      |      |     |            |      |          |       |
|-------------------|-----------|-----|-------|---|------|------|-----|------------|------|----------|-------|
| Batch             | 1715525   |     |       |   |      |      |     |            |      |          |       |
| QC1203911275      | 436504001 | DUP |       |   |      |      |     |            |      |          |       |
| Nitrogen, Ammonia |           | J   | 0.018 | U | ND   | mg/L | 200 | ^          | KLP1 | 11/06/17 | 15:16 |
| QC1203911274      | LCS       |     |       |   |      |      |     |            |      |          |       |
| Nitrogen, Ammonia |           |     | 1.00  |   | 1.08 | mg/L |     | (90%-110%) |      | 11/06/17 | 15:11 |
| QC1203911273      | MB        |     |       |   |      |      |     |            |      |          |       |
| Nitrogen, Ammonia |           |     |       | U | ND   | mg/L |     |            |      | 11/06/17 | 15:10 |

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## QC Summary

Workorder: 436850

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| Parmname                  | NOM       | Sample | Qual  | QC     | Units | RPD%   | REC%   | Range      | Anlst | Date     | Time  |
|---------------------------|-----------|--------|-------|--------|-------|--------|--------|------------|-------|----------|-------|
| <b>Nutrient Analysis</b>  |           |        |       |        |       |        |        |            |       |          |       |
| Batch                     | 1715525   |        |       |        |       |        |        |            |       |          |       |
| QC1203911276              | 436504001 | MS     |       |        |       |        |        |            |       |          |       |
| Nitrogen, Ammonia         | 1.00      | J      | 0.018 | 1.04   | mg/L  |        | 102    | (90%-110%) | KLP1  | 11/06/17 | 15:17 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| Batch                     | 1715530   |        |       |        |       |        |        |            |       |          |       |
| QC1203911298              | 436850002 | DUP    |       |        |       |        |        |            |       |          |       |
| Nitrogen, Total Kjeldahl  |           | J      | 0.070 | J      | 0.074 | mg/L   | 5.56 ^ | (+/-0.100) | KLP1  | 11/09/17 | 13:50 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| QC1203911296              | LCS       |        |       |        |       |        |        |            |       |          |       |
| Nitrogen, Total Kjeldahl  | 1.00      |        |       | 1.06   | mg/L  |        | 106    | (90%-110%) |       | 11/09/17 | 13:05 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| QC1203911295              | MB        |        |       |        |       |        |        |            |       |          |       |
| Nitrogen, Total Kjeldahl  |           |        | J     | 0.0859 | mg/L  |        |        |            |       | 11/09/17 | 13:05 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| QC1203911300              | 436850002 | MS     |       |        |       |        |        |            |       |          |       |
| Nitrogen, Total Kjeldahl  | 1.00      | J      | 0.070 | 0.925  | mg/L  |        | 85.5 * | (90%-110%) |       | 11/09/17 | 13:51 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| Batch                     | 1716170   |        |       |        |       |        |        |            |       |          |       |
| QC1203912903              | 436850001 | DUP    |       |        |       |        |        |            |       |          |       |
| Nitrogen, Nitrate/Nitrite |           |        | 3.15  | 3.06   | mg/L  | 2.9    |        | (0%-20%)   | AXH3  | 11/07/17 | 06:31 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| QC1203912902              | LCS       |        |       |        |       |        |        |            |       |          |       |
| Nitrogen, Nitrate/Nitrite | 1.00      |        |       | 1.05   | mg/L  |        | 105    | (90%-110%) |       | 11/07/17 | 06:20 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| QC1203912901              | MB        |        |       |        |       |        |        |            |       |          |       |
| Nitrogen, Nitrate/Nitrite |           |        | U     | ND     | mg/L  |        |        |            |       | 11/07/17 | 06:19 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| QC1203912905              | 436850001 | PS     |       |        |       |        |        |            |       |          |       |
| Nitrogen, Nitrate/Nitrite | 1.00      |        | 0.629 | 1.63   | mg/L  |        | 100    | (90%-110%) |       | 11/07/17 | 06:32 |
|                           |           |        |       |        |       |        |        |            |       |          |       |
| <b>Solids Analysis</b>    |           |        |       |        |       |        |        |            |       |          |       |
| Batch                     | 1716192   |        |       |        |       |        |        |            |       |          |       |
| QC1203912969              | 436850005 | DUP    |       |        |       |        |        |            |       |          |       |
| Total Dissolved Solids    |           |        | 156   | 166    | mg/L  | 10.9 * |        | (0%-5%)    | KLP1  | 11/06/17 | 12:53 |

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## QC Summary

Workorder: 436850

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| Parmname                          | NOM       | Sample | Qual | QC  | Units | RPD%     | REC%  | Range      | Anlst      | Date     | Time           |
|-----------------------------------|-----------|--------|------|-----|-------|----------|-------|------------|------------|----------|----------------|
| <b>Solids Analysis</b>            |           |        |      |     |       |          |       |            |            |          |                |
| Batch                             | 1716192   |        |      |     |       |          |       |            |            |          |                |
| QC1203912967                      | LCS       |        |      |     |       |          |       |            |            |          |                |
| Total Dissolved Solids            | 300       |        |      | 297 | mg/L  |          | 99    | (95%-105%) | KLP1       | 11/06/17 | 12:53          |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| QC1203912966                      | MB        |        |      |     |       |          |       |            |            |          |                |
| Total Dissolved Solids            |           |        | U    | ND  | mg/L  |          |       |            |            | 11/06/17 | 12:53          |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| <b>Titration and Ion Analysis</b> |           |        |      |     |       |          |       |            |            |          |                |
| Batch                             | 1716537   |        |      |     |       |          |       |            |            |          |                |
| QC1203913916                      | 436983004 | DUP    |      |     |       |          |       |            |            |          |                |
| Alkalinity, Total as CaCO3        |           |        | 68.5 |     | 67.3  | mg/L     | 1.78  | (0%-20%)   | RXB5       | 11/10/17 | 16:18          |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| Carbonate alkalinity (CaCO3)      |           | U      | ND   | U   | ND    | mg/L     | N/A   |            |            |          |                |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| QC1203913913                      | LCS       |        |      |     |       |          |       |            |            |          |                |
| Alkalinity, Total as CaCO3        | 100       |        |      |     | 108   | mg/L     |       | 108        | (90%-110%) |          | 11/10/17 12:44 |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| QC1203913918                      | 436983004 | MS     |      |     |       |          |       |            |            |          |                |
| Alkalinity, Total as CaCO3        | 100       |        | 68.5 |     | 173   | mg/L     |       | 105        | (80%-120%) |          | 11/10/17 16:19 |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| Batch                             | 1716544   |        |      |     |       |          |       |            |            |          |                |
| QC1203913924                      | 436689001 | DUP    |      |     |       |          |       |            |            |          |                |
| pH                                |           | H      | 7.97 | H   | 7.99  | SU       | 0.251 | (0%-5%)    | RXB5       | 11/10/17 | 13:08          |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| QC1203913925                      | 436983004 | DUP    |      |     |       |          |       |            |            |          |                |
| pH                                |           | H      | 7.97 | H   | 7.98  | SU       | 0.125 | (0%-5%)    |            | 11/10/17 | 16:16          |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| QC1203913923                      | LCS       |        |      |     |       |          |       |            |            |          |                |
| pH                                | 7.00      |        |      |     | 7.01  | SU       |       | 100        | (99%-101%) |          | 11/10/17 12:43 |
|                                   |           |        |      |     |       |          |       |            |            |          |                |
| Batch                             | 1717163   |        |      |     |       |          |       |            |            |          |                |
| QC1203915375                      | 436504008 | DUP    |      |     |       |          |       |            |            |          |                |
| Conductivity                      |           |        | 149  |     | 145   | umhos/cm | 2.18  | (0%-10%)   | VH1        | 11/14/17 | 13:31          |



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## QC Summary

Workorder: 436850

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| Parmname                   | NOM     | Sample | Qual | QC   | Units    | RPD% | REC% | Range      | Anlst | Date     | Time  |
|----------------------------|---------|--------|------|------|----------|------|------|------------|-------|----------|-------|
| Titration and Ion Analysis |         |        |      |      |          |      |      |            |       |          |       |
| Batch                      | 1717163 |        |      |      |          |      |      |            |       |          |       |
| QC1203915374               | LCS     |        |      |      |          |      |      |            |       |          |       |
| Conductivity               | 1410    |        |      | 1390 | umhos/cm |      | 98.5 | (95%-105%) | VH1   | 11/14/17 | 13:29 |

### 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
- 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.

December 10, 2017

[gel.com](http://gel.com)

Ms. Nita Patel  
Los Alamos National Laboratory  
TA-00, SM1237, Rm104C  
Los Alamos, New Mexico 87545

Re: LANL- WQH Water Samples  
Work Order: 439253  
SDG: 2018-656-1

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on November 02, 2017, and analyzed for Metals. 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,



Valerie Davis  
Project Manager

Chain of Custody: 2018-656  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 439253**  
**SDG: 2018-656-1**

## Table of Contents

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 439253  
SDG # : 2018-656-1**

**December 10, 2017**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on November 02, 2017 for analysis. The sample was 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 checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). Sample CAMO-18-147681 was reanalyzed out of holding for Bis(2-ethylhexyl)phthalate at LANL's request. Please see the attached email.

**Sample Identification** The laboratory received the following sample:

| <b><u>Laboratory ID</u></b> | <b><u>Client ID</u></b> |
|-----------------------------|-------------------------|
| 439253001                   | CAMO-18-147681          |

**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: Metals.

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.



Valerie Davis  
Project Manager

**List of current GEL Certifications as of 10 December 2017**

| <b>State</b>             | <b>Certification</b>         |
|--------------------------|------------------------------|
| 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                   | SC000122018-1                |
| 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                     |
| Puerto Rico              | SC00012                      |
| S.Carolina Radchem       | 10120002                     |
| South Carolina Chemistry | 10120001                     |
| Tennessee                | TN 02934                     |
| Texas NELAP              | T104704235-17-12             |
| Utah NELAP               | SC000122017-24               |
| Vermont                  | VT87156                      |
| Virginia NELAP           | 460202                       |
| Washington               | C780                         |
| West Virginia            | 997404                       |

# **Chain of Custody and Supporting Documentation**



[illegible]

|                                                                        |  |                   |  |     |    |
|------------------------------------------------------------------------|--|-------------------|--|-----|----|
| COC: 2018-656                                                          |  | TEST - Explosives |  | YES | NO |
| Samples collected from a WFO area?                                     |  |                   |  |     |    |
| Field Test for Explosives Results                                      |  |                   |  | YES | NO |
| Spot test shows presence of explosives residues. If YES - Do not ship. |  |                   |  |     | NA |

|                                                                                                                                                                      |  |     |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|
| TEST - Chemical Preservation                                                                                                                                         |  | YES | NO |
| Samples are chemically preserved?                                                                                                                                    |  | X   |    |
| Field Team Member Statement                                                                                                                                          |  | YES | NO |
| Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship. |  |     | X  |

|                                                                                                                                                                                                                                                     |                                               |                                                                                                   |     |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------|-----|----|
| TEST - Field Screen                                                                                                                                                                                                                                 |                                               |                                                                                                   | YES | NO |
| The sample has field screening measurements of alpha activity and beta activity?                                                                                                                                                                    |                                               |                                                                                                   |     |    |
| Sample Activity (dpm/100cm <sup>2</sup> )                                                                                                                                                                                                           | Shipment Activity (dpm*g/100cm <sup>2</sup> ) | Sampled Location                                                                                  | YES | NO |
| Alpha detectable                                                                                                                                                                                                                                    | Alpha >160,000                                | TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49 |     |    |
| Alpha > 125                                                                                                                                                                                                                                         | Alpha >1,250,000                              | other locations                                                                                   |     |    |
| Beta > 1,500                                                                                                                                                                                                                                        | Beta >15,000,000                              | any location                                                                                      |     |    |
| The sample Alpha >16,000,000 dpm*g/100cm <sup>2</sup> or Beta > 160,000,000 dpm*g/100cm <sup>2</sup> . If YES - Do not ship.                                                                                                                        |                                               |                                                                                                   |     |    |
| On the external surface of the sample container, alpha activity ≥ 24 dpm/cm <sup>2</sup> , beta activity ≥ 240 dpm/cm <sup>2</sup> , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship.                                                         |                                               |                                                                                                   |     |    |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity. |                                               |                                                                                                   |     |    |

|                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                |     |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| TEST - Location                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                | YES | NO |
| Prior analytical measurements of radioactive isotopes are available?                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                | X   |    |
| Sample Activity (pCi/g)                                                                                                                                                                                                                            | Shipment Activity (pCi)                                                                                                                                                                                                                                                                        | YES | NO |
| <ul style="list-style-type: none"> <li>Am-241 &gt; 27</li> <li>Cs-137 &gt; 270</li> <li>Pu-238 &gt; 27</li> <li>Pu-239/240 &gt; 27</li> <li>Th-228 &gt; 27</li> <li>U-234 &gt; 270</li> <li>U-238 &gt; 270</li> <li>H-3 &gt; 27,000,000</li> </ul> | <ul style="list-style-type: none"> <li>Am-241 &gt; 270,000</li> <li>Cs-137 &gt; 270,000</li> <li>Pu-238 &gt; 270,000</li> <li>Pu-239/240 &gt; 270,000</li> <li>Th-228 &gt; 270,000</li> <li>U-234 &gt; 1,600,000,000</li> <li>U-238 &gt; unlimited</li> <li>H-3 &gt; 27,000,000,000</li> </ul> |     |    |
| Am-241, Pu-238, Pu-239/240, or Th-228 > 27,000,000 pCi; or Cs-137 > 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship.                                                                                               |                                                                                                                                                                                                                                                                                                |     | X  |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes.  |                                                                                                                                                                                                                                                                                                |     | X  |

|                                                                                                                                                                                                                                                                |  |     |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|----|----|
| TEST - AK                                                                                                                                                                                                                                                      |  | YES | NO | NA |
| The shippers documented knowledge of the sample positively identifies appropriate labeling.                                                                                                                                                                    |  |     |    |    |
| The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, and the sample is submitted to ARS or RP for hazard classification analysis. |  |     |    |    |

|                                                          |  |
|----------------------------------------------------------|--|
| HOLD SAMPLES FOR ANALYSIS                                |  |
| The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7] |  |

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

|                                 |           |
|---------------------------------|-----------|
| Hazard Assessment Completed By: | Date/Time |
| (Printed Name) MATT ENGLERT     | 11-01-17  |
| (Signature) <i>[Signature]</i>  | 1500      |

|                                   |           |
|-----------------------------------|-----------|
| Hazard Assessment Reviewed By:    | Date/Time |
| (Printed Name) <i>[Signature]</i> | 11/1/17   |
| (Signature) <i>[Signature]</i>    | 1500      |

**SAMPLE RECEIPT & REVIEW FORM**

| Client: <u>QRSL</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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SDG/AR/COC/Work Order: <u>436850</u>                                                                                                                                                                                                                                                                                          |                          |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |             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| Received By: <u>[Signature]</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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Date Received: <u>11/2/17</u>                                                                                                                                                                                                                                                                                                 |                          |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |             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| Carrier and Tracking Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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Circle Applicable:<br><input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other<br><u>590817831000-5</u><br><u>590817831011-5</u><br><u>590817831022-6</u> |                          |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |             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                   |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| Suspected Hazard Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.        |                                                                                                                                                                                                                                                                                                                               |                          |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |              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| Shipped as a DOT Hazardous?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Hazard Class Shipped: _____ UN#:                                                                                                  |                                                                                                                                                                                                                                                                                                                               |                          |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |              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                   |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| COC/Samples marked or classified as radioactive?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr<br>Classified as: Rad 1 Rad 2 Rad 3 |                                                                                                                                                                                                                                                                                                                               |                          |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| Is package, COC, and/or Samples marked HAZ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | If yes, select Hazards below, and contact the GEL Safety Group.<br>PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:    |                                                                                                                                                                                                                                                                                                                               |                          |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |              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                   |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Sample Receipt Criteria</th> <th>Yes</th> <th>NA</th> <th>No</th> <th>Comments/Qualifiers (Required for Non-Conforming Items)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Shipping containers received intact and sealed?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Circle Applicable: Seals broken Damaged container Leaking container Other (describe)</td> </tr> <tr> <td>2</td> <td>Chain of custody documents included with shipment?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>3</td> <td>Samples requiring cold preservation within (0 ≤ 6 deg. C)?*</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Preservation Method: Wet Ice Ice Packs Dry Ice None Other: <u>See Above</u><br/>*all temperatures are recorded in Celsius</td> </tr> <tr> <td>4</td> <td>Daily check performed and passed on IR temperature gun?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Temperature Device Serial #: <u>IR3-16</u><br/>Secondary Temperature Device Serial # (If Applicable):</td> </tr> <tr> <td>5</td> <td>Sample containers intact and sealed?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Circle Applicable: Seals broken Damaged container Leaking container Other (describe)</td> </tr> <tr> <td>6</td> <td>Samples requiring chemical preservation at proper pH?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Sample ID's and Containers Affected:<br/>If Preservation added, List:</td> </tr> <tr> <td>7</td> <td>Do any samples require Volatile Analysis?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>If Yes, Are Encores or Soil Kits present? Yes ___ No ___ (If yes, take to VOA freezer)<br/>Do VOA vials contain acid preservation? Yes ___ No ___ N/A (If unknown, select No)<br/>VOA vials free of headspace? Yes ___ No ___ N/A<br/><input checked="" type="checkbox"/> Sample ID's and containers affected:</td> </tr> <tr> <td>8</td> <td>Samples received within holding time?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>ID's and tests affected:</td> </tr> <tr> <td>9</td> <td>Sample ID's on COC match ID's on bottles?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Sample ID's and containers affected:</td> </tr> <tr> <td>10</td> <td>Date &amp; time on COC match date &amp; time on bottles?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Sample ID's affected:</td> </tr> <tr> <td>11</td> <td>Number of containers received match number indicated on COC?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Sample ID's affected:</td> </tr> <tr> <td>12</td> <td>Are sample containers identifiable as GEL provided?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td>13</td> <td>COC form is properly signed in relinquished/received sections?</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> </tr> </tbody> </table> |                                                                     |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                               |                          |                                                                                                                                                                                                                                                                                                             | Sample Receipt Criteria |  | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) | 1 | Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) | 2 | Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  | 3 | Samples requiring cold preservation within (0 ≤ 6 deg. C)?* | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Preservation Method: Wet Ice Ice Packs Dry Ice None Other: <u>See Above</u><br>*all temperatures are recorded in Celsius | 4 | Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temperature Device Serial #: <u>IR3-16</u><br>Secondary Temperature Device Serial # (If Applicable): | 5 | Sample containers intact and sealed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) | 6 | Samples requiring chemical preservation at proper pH? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's and Containers Affected:<br>If Preservation added, List: | 7 | Do any samples require Volatile Analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If Yes, Are Encores or Soil Kits present? Yes ___ No ___ (If yes, take to VOA freezer)<br>Do VOA vials contain acid preservation? Yes ___ No ___ N/A (If unknown, select No)<br>VOA vials free of headspace? Yes ___ No ___ N/A<br><input checked="" type="checkbox"/> Sample ID's and containers affected: | 8 | Samples received within holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | ID's and tests affected: | 9 | Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's and containers affected: | 10 | Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: | 11 | Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: | 12 | Are sample containers identifiable as GEL provided? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  | 13 | COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| Sample Receipt Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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NA                                                                                                                                                                                                                                                                                                                            | No                       | Comments/Qualifiers (Required for Non-Conforming Items)                                                                                                                                                                                                                                                     |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |             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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Shipping containers received intact and sealed?                     | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe)                                                                                                                                                                                                                        |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Chain of custody documents included with shipment?                  | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Samples requiring cold preservation within (0 ≤ 6 deg. C)?*         | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Preservation Method: Wet Ice Ice Packs Dry Ice None Other: <u>See Above</u><br>*all temperatures are recorded in Celsius                                                                                                                                                                                    |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Daily check performed and passed on IR temperature gun?             | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Temperature Device Serial #: <u>IR3-16</u><br>Secondary Temperature Device Serial # (If Applicable):                                                                                                                                                                                                        |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Sample containers intact and sealed?                                | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe)                                                                                                                                                                                                                        |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Samples requiring chemical preservation at proper pH?               | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Sample ID's and Containers Affected:<br>If Preservation added, List:                                                                                                                                                                                                                                        |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Do any samples require Volatile Analysis?                           | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | If Yes, Are Encores or Soil Kits present? Yes ___ No ___ (If yes, take to VOA freezer)<br>Do VOA vials contain acid preservation? Yes ___ No ___ N/A (If unknown, select No)<br>VOA vials free of headspace? Yes ___ No ___ N/A<br><input checked="" type="checkbox"/> Sample ID's and containers affected: |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Samples received within holding time?                               | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | ID's and tests affected:                                                                                                                                                                                                                                                                                    |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Sample ID's on COC match ID's on bottles?                           | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Sample ID's and containers affected:                                                                                                                                                                                                                                                                        |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Date & time on COC match date & time on bottles?                    | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Sample ID's affected:                                                                                                                                                                                                                                                                                       |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Number of containers received match number indicated on COC?        | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> | Sample ID's affected:                                                                                                                                                                                                                                                                                       |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Are sample containers identifiable as GEL provided?                 | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | COC form is properly signed in relinquished/received sections?      | <input checked="" type="checkbox"/>                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> |                                                                                                                                                                                                                                                                                                             |                         |  |     |    |    |                                                         |   |                                                 |                                     |                          |                          |                                                                                      |   |                                                    |                                     |                          |                          |  |   |                                                             |                                     |                          |                          |                                                                                                                          |   |                                                         |                                     |                          |                          |                                                                                                      |   |                                      |                                     |                          |                          |                                                                                      |   |                                                       |                                     |                          |                          |                                                                      |   |                                           |                                     |                          |                          |                                                                                                                                                                                                                                                                                                             |   |                                       |                                     |                          |                          |                          |   |                                           |                                     |                          |                          |                                      |    |                                                  |                                     |                          |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |
| Comments (Use Continuation Form if needed):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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                   |                          |                       |    |                                                              |                                     |                          |                          |                       |    |                                                     |                                     |                          |                          |  |    |                                                                |                                     |                          |                          |  |

PM (or PMA) review: Initials [Signature]

Date 11/2/17

Page 1 of 1

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

SHIP DATE: 01NOV17  
ACTWGT: 25.0 LB MAN  
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545  
UNITED STATES US

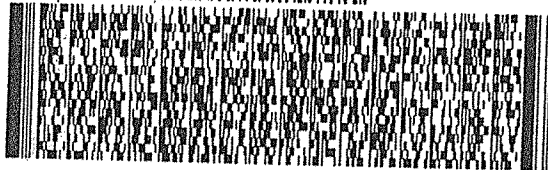
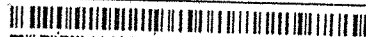
BILL SENDER

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

**CHARLESTON SC 29407**

(843) 658-8171

REF: WE6L11651000



**FedEx**  
Express



TRK# 5908 1783 1022  
0201

THU - 02 NOV 10:30/  
PRIORITY OVERNIGHT

**X7 RBWA**

29407  
SC-US CHS

Part #: 156148V-434 RIT2 08/15



VERBODEN TOEGANG

ORIGIN ID:SAFA (SOS) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TRAO BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 01NOV17  
ACTWT: 48.0 LB MAN  
CAD: 0014176/CPE2916  
BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWS0



1 of 2

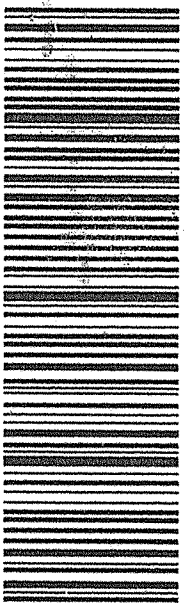
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0201  
## MASTER ##

THU - 02 NOV 10:30  
PRIORITY OVERNIGHT

X7 RBWA

29407  
SC-US CHS

Part # 156148V-434 RIT2 06/15 23



VERBODEN TOEGANG

ORIGIN ID:SAFA (SOS) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TRAO BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

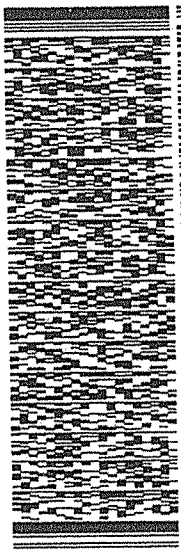
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BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWS0



2 of 2

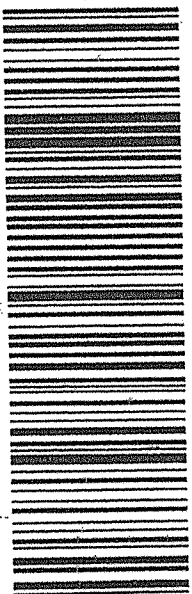
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0263  
Mstr# 5908 1783 1000  
0201

THU - 02 NOV 10:3  
PRIORITY OVERNIGHT

X7 RBWA

294  
SC-US C

Part # 156148V-434 RIT2 06/15 23



**Subject:** FW: reanalysis requests  
**From:** "Patel, Nita" <npatel@lanl.gov>  
**Date:** 12/4/2017 1:41 PM  
**To:** Valerie Davis <vsd@gel.com>

---

**From:** Ding, Mei  
**Sent:** Monday, December 4, 2017 11:27:16 AM  
**To:** Patel, Nita; Mark, Paul  
**Cc:** Marczak, Stanislaw; Cygnarowicz, Robert Michael; Katzman, Danny  
**Subject:** reanalysis requests

Hello Nita and Paul,

Would you have the following two samples reanalyzed.

1. CAPA-18-147581, Bis(2-ethylhexyl)phthalate

Current result (7.6 ug/l) is above EPA STD. interesting thing is that this well (R-39), Bis(2-ethylhexyl)phthalate in initial sample (9.8 ug/L) was also above EPA STD from last year, but reanalysis result was dropped to 3.53 ug/L.

2. CAMO-18-147681, Chromium

Chromium concentration in this location (R-45 S2) is jumped to 42.5 ug/L (doubled from previous values). This chromium concentration is close to that of in R-45 S1. I wondered if the lab has exchanged the samples.

Thanks,

mei

# **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<br>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<br>identification of the analyte (TIC). Quantitation is based on nearest internal standard<br>response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration<br>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.

# Metals Analysis

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2018-656-1**  
**Work Order #: 439253**

| <b>Sample ID</b> | <b>Client ID</b>                                  |
|------------------|---------------------------------------------------|
| 439253001        | CAMO-18-147681                                    |
| 1203934749       | Method Blank (MB)ICP-MS                           |
| 1203934750       | Laboratory Control Sample (LCS)                   |
| 1203934753       | 439253001(CAMO-18-147681L) Serial Dilution (SD)   |
| 1203934751       | 439253001(CAMO-18-147681D) Sample Duplicate (DUP) |
| 1203934752       | 439253001(CAMO-18-147681S) Matrix Spike (MS)      |

**Sample Analysis**

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

**Method/Analysis Information**

|                                       |                                             |
|---------------------------------------|---------------------------------------------|
| <b>Analytical Batch:</b>              | 1724775                                     |
| <b>Prep Batch :</b>                   | 1724774                                     |
| <b>Standard Operating Procedures:</b> | GL-MA-E-014 REV# 32 and GL-MA-E-006 REV# 14 |
| <b>Analytical Method:</b>             | SW846 3005A/6020A DOE-AL                    |
| <b>Prep Method :</b>                  | SW846 3005A                                 |

**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 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 CRDL/PQL standard recoveries met the referenced advisory control limits.

**ICSA/ICSAB Statement**

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. For the ICP-MS analysis, the ICSA solution contains 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 MB analyzed with this SDG met the acceptance criteria.

##### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

##### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

##### **Quality Control (QC) Sample Statement**

The following sample was selected as the quality control (QC) sample for this SDG: 439253001 (CAMO-18-147681).

##### **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 sample in this SDG did not require dilutions.

##### **Preparation Information**

The sample in this SDG was 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.

#### **Additional Comments**

Additional comments were not required for this SDG.

### **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: 2018-656-1 GEL Work Order: 439253

#### **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: 11 DEC 2017**

**Title: Data Validator**

# **Sample Data Summary**



---

**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2018-656-1**CONTRACT:** ESHL00114**METHOD TYPE:** SW846**SAMPLE ID:** 439253001**BASIS:** As Received**DATE COLLECTED** 31-OCT-17**CLIENT ID:** CAMO-18-147681**LEVEL:** Low**DATE RECEIVED** 02-NOV-17**MATRIX:** W**%SOLIDS:** 0

| CAS       | Analyte  | Result | Units | Qual | MDL | PQL | CRDL | DF | M* | Analyst | Run Date       | Analytical Run | Analytical Batch |
|-----------|----------|--------|-------|------|-----|-----|------|----|----|---------|----------------|----------------|------------------|
| 7440-47-3 | Chromium | 47.4   | ug/L  |      | 3   | 10  | 10   | 1  | MS | PRB     | 12/10/17 02:49 | 171209-1       | 1724775          |

**Prep Information:**

| Analytical Batch | Prep Batch | Prep Method | Initial wt./vol. | Units | Final wt./vol. | Units | Date     | Analyst |
|------------------|------------|-------------|------------------|-------|----------------|-------|----------|---------|
| 1724775          | 1724774    | SW846 3005A | 25               | mL    | 25             | mL    | 12/09/17 | SXW1    |

**\*Analytical Methods:****MS**      **SW846 3005A/6020A DOE-AL**

# **Quality Control Summary**

---

**METALS**  
**-3b-**  
**PREPARATION BLANK SUMMARY**

**SDG NO.** 2018-656-1

**Contract:** ESHL00114

**Matrix:** W

---

| <u>Sample ID</u> | <u>Analyte</u> | <u>Result</u> | <u>Units</u> | <u>Acceptance<br/>Window</u> | <u>Conc<br/>Qual</u> | <u>M*</u> | <u>MDL</u> | <u>RDL</u> |
|------------------|----------------|---------------|--------------|------------------------------|----------------------|-----------|------------|------------|
| 1203934749       | Chromium       | 3             | ug/L         | +/-10                        | U                    | MS        | 3          | 10         |

---

**\*Analytical Methods:**

MS SW846 3005A/6020A DOE-AL

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2018-656-1 **Client ID:** CAMO-18-147681S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 439253001 **Spike ID:** 1203934752

| <u>Analyte</u> | <u>Units</u> | <u>Acceptance<br/>Limit</u> | <u>Spiked<br/>Result</u> | <u>C</u> | <u>Sample<br/>Result</u> | <u>C</u> | <u>Spike<br/>Added</u> | <u>%<br/>Recovery</u> | <u>Qual</u> | <u>M*</u> |
|----------------|--------------|-----------------------------|--------------------------|----------|--------------------------|----------|------------------------|-----------------------|-------------|-----------|
| Chromium       | ug/L         | 75-125                      | 96.5                     |          | 47.4                     |          | 50                     | 98.2                  |             | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A DOE-AL

---

**Metals**  
**-6-**  
**Duplicate Sample Summary**

**SDG No.:** 2018-656-1**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO-18-147681D**Matrix:** WATER**Level:** Low**Sample ID:** 439253001**Duplicate ID:** 1203934751**Percent Solids for Dup:** N/A

---

| Analyte  | Units | Acceptance<br>Limit | Sample<br>Result | C | Duplicate<br>Result | C | RPD  | Qual | M* |
|----------|-------|---------------------|------------------|---|---------------------|---|------|------|----|
| Chromium | ug/L  | +/-10               | 47.4             |   | 48.1                |   | 1.46 |      | MS |

---

**\*Analytical Methods:**

MS SW846 3005A/6020A DOE-AL

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2018-656-1

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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> |
|------------------|----------------|--------------|-------------------|---------------|----------|-------------------|-------------------------|-----------|
| 1203934750       | Chromium       | ug/L         | 50                | 51.6          |          | 103               | 80-120                  | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A DOE-AL

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2018-656-1 **Client ID:** CAMO-18-147681L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 439253001 **Serial Dilution ID:** 1203934753

| <u>Analyte</u> | <u>Initial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>Serial<br/>Value<br/>ug/L</u> | <u>C</u> | <u>%<br/>Difference</u> | <u>Qual</u> | <u>Acceptance<br/>Limit</u> | <u>M*</u> |
|----------------|-----------------------------------|----------|----------------------------------|----------|-------------------------|-------------|-----------------------------|-----------|
| Chromium       | 47.4                              |          | 48.4                             | J        | 1.977                   |             |                             | MS        |

## \*Analytical Methods:

MS SW846 3005A/6020A DOE-AL