

### TABLE OF CONTENTS FOR QC III+ DATA PACKAGE

LABORATORY IDENTIFICATION NUMBER: 1510566

SECTION 1.

3440 South 700 West

Salt Lake City, UT 84119

CASE NARRATIVE CHAIN-OF-CUSTODIES

SECTION 2.

Phone: (801) 263-8686

Toll Free: (888) 263-8686 ANALYTICAL REPORTS

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

SECTION 3.

web: www.awal-labs.com

**BATCH QC REPORTS** 

SECTION 4.

Kyle F. Gross

Laboratory Director

INSTRUMENT QC SUMMARIES

Jose Rocha

SECTION 5.

QA Officer

LOGBOOKS, RUNLOGS AND RAW DATA PER ANALYSIS

Assembled by:

Reviewed by:



Digitally signed by Melissa Connolly DN: cn=Melissa Connolly, o=American West Analytical Laboratories, ou, email=melissa@awal-labs.com, c=US

Kyle F. Gross

Digitally signed by Kyle F. Gross Date: 2015.11.30 17:46:37 -07'00'



### SECTION 1.

- □ CASE NARRATIVE
- □ AWAL CHAIN-OF-CUSTODY
- □ CLIENT CHAIN-OF-CUSTODY

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686 Toll Free: (888) 263-8686 Fax: (801) 263-8687 e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Report Date: 11/30/2015 Page 2 of 487



### 3440 South 700 West Salt Lake City, UT 84119

Kyle F. Gross Laboratory Director

Report Date: 11/30/2015 Page 3 of 487

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687 e-mail: awal@awal-labs.com, web: www.awal-labs.com

Jose Rocha QA Officer

Jim Harris Utah Division of Water Quality PO Box 144870 SLC, UT 84114

TEL: (801) 538-6329

RE: Gold King Mine Spill / 01255.1.016.03

Dear Jim Harris: Lab Set ID: 1510566

American West Analytical Laboratories received sample(s) on 10/27/2015 for the analyses presented in the following report.

American West Analytical Laboratories (AWAL) is accredited by The National Environmental Laboratory Accreditation Program (NELAP) in Utah and Texas; and is state accredited in Colorado, Idaho, New Mexico, Wyoming, and Missouri.

All analyses were performed in accordance to the NELAP protocols unless noted otherwise. Accreditation scope documents are available upon request. If you have any questions or concerns regarding this report please feel free to call.

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Thank You,

Kyle F. Digitally signed by Kyle F. Gross Date:

Gross 2015.11.30
17:46:58 -07'00'

Approved by:

Lab Set ID: 1510566

Laboratory Director or designee

# American West Analytical Laboratories

Samples 12 and 13 taken off hold per Brad. -EH

Client:         Utah Div           Client ID:         UTD200           Project:         Gold Kin           Comments:         Email to           received         received           Sample ID         Client San           1510566-001A         GK01-ST           1510566-003A         GK01-ST           1510566-004A         GK01-ST           1510566-005A         GK01-ST           1510566-005A         GK01-ST	Utah Division of Water Quality UTD200 Gold King Mine Spill / 01255.1.016.03		Contact:	Jim Harris	Due D	Date: 11/	Due Date: 11/11/2015	
	)200 d King Mine Spill / 01255.1.016.03		Contact:	Jim Harris	{ }			
	d King Mine Spill / 01255.1.016.03							
			QC Level:	: III+ MDL	TOM	WO Type: Standard	ındard	
1A 2A 3A 4A 5A	Email to lenoras@utah.gov. / CC Brad Martin received outside of hold. Include EDD;		28-15 proceed wit	QC 3+ / 10-28-15 proceed with analysis for Samples #12 & #13, per Brad. Footnote report, pH, TSS, & TDS	? & #13, per Brad. Foc	otnote rep	port, pH, TSS,	& TDS
	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel	Storage	
	GK01-ST-01	10/9/2015 1200h	10/27/2015 1525h		Aqueous		DF-Hold	1
	GK01-ST-02	10/10/2015 0000h	10/27/2015 1525h		Aqueous		DF-Hold	1
	GK01-ST-03	10/10/2015 1200h	10/27/2015 1525h		Aqueous		DF-Hold	1
	GK01-ST-04	10/11/2015 0000h	10/27/2015 1525h		Aqueous		DF-Hold	1
	GK01-ST-05	10/11/2015 1200h	10/27/2015 1525h		Aqueous		DF-Hold	1
1510566-006A <b>GK0</b>	GK01-ST-06	10/12/2015 0000h	10/27/2015 1525h		Aqueous		DF-Hold	1
1510566-007A <b>GK0</b>	GK01-ST-07	10/12/2015 1200h	10/27/2015 1525h		Aqueous		DF-Hold	
1510566-008A <b>GK0</b>	GK01-ST-08	10/13/2015 0000h	10/27/2015 1525h		Aqueous		DF-Hold	1
1510566-009A <b>GK0</b>	GK01-ST-09	10/13/2015 1200h	10/27/2015 1525h		Aqueous		DF-Hold	1
1510566-010A <b>GK0</b>	GK01-ST-10	10/14/2015 0000h	10/27/2015 1525h		Aqueous		DF-Hold	1
1510566-011A <b>GK0</b>	GK01-ST-11	10/14/2015 1200h	10/27/2015 1525h		Aqueous		DF-Hold	1
1510566-012A <b>GK0</b>	GK01-ST-12	10/15/2015 0000h	10/27/2015 1525h	300.0-W	Aqueous	>	DF-WC	1
				2 SEL Analytes: CL SO4				
				3005A-ICPMS-PR			DF-WC	
				ALK-W-2320B		>	DF-WC	
				3 SEL Analytes: ALK ALKB ALKC	ALKC			
				COND-W-2510B			DF-WC	
				HARD-2340B			DF-WC	
				NO2/NO3-W-353.2			DF-WC	
				PH-4500H+B			DF-WC	
				PO4-W-4500PF			DF-WC	
				PO4-W-PR			DF-WC	
				TDS-W-2540C			DF-WC	
				TSS-W-2540D			DF-WC	
1510566-013A <b>GK0</b>	GK01-ST-13	10/15/2015 1200h	10/27/2015 1525h	200.7-W	Aqueous	>	DF-Metals	1
				6 SEL Analytes: AL CA FE MG K NA	MG K NA			
				200.7-W-PR			DF-Metals	

OC [

TAT

CN CN

RT

□ W%

Printed: 11/25/2015 FOR LABORATORY USE ONLY [fill out on page 1]:

Present on Outer Package AWAL Lab Sample Set# ➂ Unbroken on Sample abels and COC Record 454 All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyta lists and reporting limits (POL) unless specifically requested otherwise on this Chain of Custody and/or stached documentation. made, signed reports will be emailed by 5:00 pm on the day they are due. Unless other arrangements have bee Known Hazards Report down to the MDL Include EDD: Lab Filter for: special Instructions For Compliance With: NLLAP Non-Compliance Other: Field Filtered For: Sample CHAIN OF CUSTODY 51/22/01 . (5:25 1 2 3 4 5 Stnd Turn Around Time: ₹ (₹) 2+ 3 QC Level: 7 ample Matrix ⋛ 888 0000  $\infty$ තිනු S S 88 Sampled 1200 002/ 8 1200 1200 33 Time gnature けだ で で で Fax# (801) 263-8687 Email awal@awal-labs.com Phone # (801) 263-8686 Toll Free # (888) 263-8686 COII#: 630 697 Analytical Laboratories 3440 S. 700 W. Salt Lake City, UT 84119 Brad Marks ,84119 **American West** www.awal-labs.com 17.05 016.03 ひをす Nix 8 801 536 4860 le chian Sample ID 0/255 Jak V 51-09 Pool -37-06 80-15-87-10 10-15ako1 -5[ -03 20-725-40-15-0 GK01-ST-02 Client: GKOI-ST Address: Project Name: Project #: PO# Phone #: Email: Sampler Name: Contact: "Kot ことのこ 3K01 GKOL Skol SK01 GKOI Sko GK01

AWAL Lab Sample Set # Laboratory Use Only 7,5 Unbroken on San Y N 1510566 3. Temperature All enalysis will be conducted using NELAP accredited methods and all data will be reported using AWKL's standard analyta lists and reporting limits (PQL), unless specifically requested otherwise on this Chain of Custody andor stacked documentation. 5:00 pm on the day they are due Sample Comments Known Hazards r Compliance With: NELAP RCRA □ Field Filtered For: CHAIN OF CUSTODY 12345(Stind) Turn Around Time: \$. 2 2+3 QC Level: of Containers 0000 0000 565 Sampled 1200 Brad Batic Date Sampled Phone # (801) 263-8686 Toll Free # (888) 263-8686 Fax # (801) 263-8687 Email awal@awal-labs.com 630 491 3440 S, 700 W. Salt Lake City, UT 84119 Analytical Laboratories **American West** www.awal-labs.com Cell #: Mino 2005 26.03 Sample ID ξ -187-16 11-25-6ko1 - 87 - 15 Project #: Client Project Name: ₽O # Email: Contact: Phone #: Sampler Name: Gko1 GKOL 1045

### **Elona Hayward**

From:

Rebekah Winkler

Sent:

Wednesday, October 28, 2015 6:40 AM

To:

Elona Hayward

Subject:

FW: TechLaw - Gold King Mine samples - samples received 10/27/15

Attachments:

Utah COCs 10-23-15.pdf

Take off hold/add analysis for TechLaw's samples received yesterday.

From: Martin, Bradley [mailto:BMartin@TechLawInc.com]

Sent: Wednesday, October 28, 2015 6:29 AM

To: Rebekah Winkler

Subject: TechLaw - Gold King Mine samples - samples received 10/27/15

Hi Rebekah – For the samples received yesterday I would like the following analyzed for total metals:

GK01-ST-13 10/15/15 1200 V

GK02-ST-13 10/15/15 1200

GK02-ST-20 10/19/15 0000

GK02-ST-21 10/19/15 1200

GK02-ST-22 10/20/15 0000

GK02-ST-23 10/20/15 1200

GK02-ST-24 10/21/15 0000

GK03-ST-13 10/15/15 1200

GK03-ST-20 10/19/15 0000

GK03-ST-21 10/19/15 1200

GK03-ST-22 10/20/15 0000

GK03-ST-23 10/20/15 1200

GK03-ST-24 10/21/15 0000

GK04-ST-13 10/15/15 1200

GK04-ST-19 10/18/15 1200

GK04-ST-20 10/19/15 0000

GK04-ST-21 10/19/15 1200

GK04-ST-22 10/20/15 0000 GK04-ST-23 10/20/15 1200

GK04-ST-24 10/21/15 0000

Also, can we sample the following samples for the nutrient list below (I realize several of the holding time may have expired – it's the nature of this particular sampling method)

GK01-ST-12 10/15/15 0000

GK02-ST-12 10/15/15 0000

GK03-ST-12 10/15/15 0000

GK04-ST-12 10/15/15 0000

GK05-ST-03 10/11/15 1200

Hardness

2340B

Conductivity

SM2510B

Alkalinity

SM2320B

Anions (Carbonate, Bicarbonate, Sulfate and Chloride)

300.0

Nitrate/Nitrite Phosphorus, total 353.2 4500-PF

TDS SM2540C

TSS SM2540D

рΗ

9040C

Thanks, Brad

Bradley K. Martin, P.E.

TechLaw, Inc.
55 West Monroe Street, Suite 3450
Chicago, IL 60603
T 312.345.8960
M 630.697.5407
bmartin@techlawinc.com
www.techlawinc.com



### **Inorganic Case Narrative**

Client: Utah Division of Water Quality

**Contact:** Jim Harris

**Project:** Gold King Mine Spill / 01255.016.03

**Lab Set ID:** 1510566

3440 South 700 West

Salt Lake City, UT 84119

**Sample Receipt Information:** 

 Date of Receipt:
 10/27/2015

 Date of Collection:
 10/9-10/17/2015

 Date of Analyses Request:
 10/28/2015

Sample Condition: Intact C-O-C Discrepancies: None

Phone: (801) 263-8686 Toll Free: (888) 263-8686

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross

Laboratory Director

Lab Set ID: 1510566

Jose Rocha
OA Officer

samples were performed within the method holding times, with the following exceptions: the analyses for test codes PH-4500H+B, TDS-W-2540C, and TSS-W-2540D were received outside of the holding time. All samples were properly preserved.

Holding Time and Preservation Requirements: The analysis and preparation of all

**Preparation and Analysis Requirements:** The samples were analyzed following the methods stated on the analytical reports. The requested method of 9040C is equivalent to the reported method of SM4500-H+B for pH analysis. The laboratory reported method SM4500-H+B as it is a method applicable to the CWA (Clean Water Act).

**Analytical QC Requirements:** All instrument calibration and calibration check requirements were met. All internal standard recoveries met method criterion.

Batch QC Requirements: MB, LCS, MS, MSD, RPD, DUP, PDS, SD:

**Method Blanks (MBs):** No target analytes were detected above the reporting limits, indicating that the procedure was free from contamination. Vanadium on sample MB-40002 was observed between the MDL and reporting limit.

**Laboratory Control Sample (LCSs):** All LCS recoveries were within control limits, indicating that the preparation and analysis were in control.

Matrix Spike / Matrix Spike Duplicate (MS/MSD): All percent recoveries and RPDs (Relative Percent Differences) were inside established limits, with the following exceptions:

Sample ID	Analyte	QC	Explanation					
1510566-013A	Aluminum	MS/MSD	High analyte concentration					
1510566-013A	Antimony	MS/MSD/RPD	Sample matrix interference or					
			sample non-homogeneity					
1510566-013A	Barium	MS/MSD/RPD	High analyte concentration					
1510566-013A	Calcium	MS/MSD	High analyte concentration					
1510566-013A	Iron	MS/MSD/RPD	High analyte concentration					

Report Date: 11/30/2015 Page 10 of 487



3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686
Toll Free: (888) 263-8686
Fax: (801) 263-8687
e-mail: awal@awal-labs.com

web: www.awal-labs.com

Lab Set ID: 1510566

Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

1510566-013A	Magnesium	MS/MSD	Sample matrix interference
1510566-013A	Manganese	MS/MSD/RPD	High analyte concentration
1510566-013A	Molybdenum	MS	Sample matrix interference
1510566-013A	Potassium	MSD	Sample matrix interference
1515066-013A	Sodium	MSD	Sample matrix interference
1510561-018A	Phosphate	MS	Sample matrix interference
1510563-021A	Phosphate	MS/MSD/RPD	High analyte concentration
1510566-012A	Phosphate	MS/MSD/RPD	Sample matrix interference or
			sample non-homogeneity
1510567-013A	Aluminum	MS/MSD	High analyte concentration
1510567-013A	Antimony	MS/MSD	Sample matrix interference
1510567-013A	Barium	MS	Sample matrix interference
1510567-013A	Calcium	MSD	High analyte concentration
1510567-013A	Iron	MS	High analyte concentration
1510567-013A	Manganese	MSD	Sample matrix interference
1510567-013A	Silver	MSD	High analyte concentration

**Duplicate (DUP):** The parameters that require a duplicate analysis had RPDs within the control limits, with the following exceptions: the RPDs were outside of the control limits on samples 1510561-018A and 1510566-012A and Total Dissolved Solids and Total Suspended Solids due to suspected sample non-homogeneity or matrix interference.

**Post Digestion Spike (PDS):** The PDS percent recoveries were within the control limits, with the following exceptions: the PDS percent recoveries for Aluminum on samples 1510566-013APDS and 1510567-013APDS were outside of the control limits due to sample matrix interference.

**Serial Dilution (SD):** The serial dilution RPDs were within the control limits, with the following exceptions: The analyte concentrations for Antimony, Selenium, and Silver on sample 1510566-013A and for Antimony, Molybdenum, Selenium, Silver, Thallium, and Vanadium on sample 1510567-013A were too low for serial dilution evaluation.

Corrective Action: None required.



### **SAMPLE SUMMARY**

Contact: Jim Harris

Client: Utah Division of Water Quality

**Project:** Gold King Mine Spill / 01255.1.016.03

**Lab Set ID:** 1510566

**Date Received:** 10/27/2015 1525h

	Lab Sample ID	Client Sample ID	Date Collect	ed Matrix	Analysis
3440 South 700 West	1510566-012A	GK01-ST-12	10/15/2015 (	000h Aqueous	Hardness
Salt Lake City, UT 84119	1510566-012A	GK01-ST-12	10/15/2015 (	1	рН
	1510566-012A	GK01-ST-12	10/15/2015 (	OO0h Aqueous	Total Dissolved Solids, A2540C
	1510566-012A	GK01-ST-12	10/15/2015 (	000h Aqueous	TSS
Phone: (801) 263-8686	1510566-012A	GK01-ST-12	10/15/2015 (	000h Aqueous	Nitrite/Nitrate (as N), E353.2
Toll Free: (888) 263-8686	1510566-012A	GK01-ST-12	10/15/2015 (	000h Aqueous	Total Phosphate, Aqueous
Fax: (801) 263-8687	1510566-012A	GK01-ST-12	10/15/2015 (	000h Aqueous	Anions, E300.0
e-mail: awal@awal-labs.com	1510566-012A	GK01-ST-12	10/15/2015 (	000h Aqueous	Alkalinity/ Bicarbonate/ Carbonate, A2320B
web: www.awal-labs.com	1510566-012A	GK01-ST-12	10/15/2015 (	000h Aqueous	Conductivity (Specific Conductance)
	1510566-013A	GK01-ST-13	10/15/2015	200h Aqueous	ICP Metals, Total
	1510566-013A	GK01-ST-13	10/15/2015	200h Aqueous	Mercury, Drinking Water
Kyle F. Gross	1510566-013A	GK01-ST-13	10/15/2015	200h Aqueous	ICPMS Metals, Total

Jose Rocha QA Officer

Laboratory Director

Lab Set ID: 1510566



### SECTION 2.

### ANALYTICAL REPORTS

- □ The contract required detection limits (CRDL's) were met.
- ☐ There is an analytical report for each sample on the chain-of-custody.
- □ The results and dates on the analytical reports match the raw data.
- ☐ The information on the header of the analytical reports including the field ID's, the sample dates, and the received date match the chain-of-custody.

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686 Toll Free: (888) 263-8686 Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha

QA Officer



### 3440 South 700 West Salt Lake City, UT 84119

Kyle F. Gross Laboratory Director

Report Date: 11/30/2015 Page 14 of 487

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687 e-mail: <a href="mailto:awal@awal-labs.com">awal@awal-labs.com</a>, web: <a href="mailto:www.awal-labs.com">www.awal-labs.com</a>

Jose Rocha QA Officer

### **INORGANIC ANALYTICAL REPORT**

Client: Utah Division of Water Quality Contact: Jim Harris

**Project:** Gold King Mine Spill / 01255.1.016.03

 Lab Sample ID:
 1510566-013

 Client Sample ID:
 GK01-ST-13

 Collection Date:
 10/15/2015 1200h

 Received Date:
 10/27/2015 1525h

Analytical Results TOTAL METALS

Compound	CAS	Units	Date Prepared	Date Analyzed	Method Used	MDL	Reporting Limit	Analytical Result	Qual
Aluminum	7429-90-5	mg/L	10/29/2015 1404h	11/4/2015 1633h	E200.7	0.237	1.00	40.8	2 §
Antimony	7440-36-0	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.0000366	0.00200	0.000857	J1\$@
Arsenic	7440-38-2	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.0000920	0.00200	0.0123	
Barium	7440-39-3	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.000538	0.00200	1.15	2
Beryllium	7440-41-7	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.0000288	0.00200	0.00305	
Cadmium	7440-43-9	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.000193	0.000500	0.00117	
Calcium	7440-70-2	mg/L	10/29/2015 1404h	11/4/2015 1109h	E200.7	0.401	10.0	261	2
Chromium	7440-47-3	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.00154	0.00200	0.0287	
Cobalt	7440-48-4	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.0000434	0.00400	0.0274	
Copper	7440-50-8	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.000692	0.00200	0.0563	
Iron	7439-89-6	mg/L	10/29/2015 1404h	11/4/2015 1109h	E200.7	0.767	1.00	46.3	2
Lead	7439-92-1	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.000264	0.00200	0.0461	
Magnesium	7439-95-4	mg/L	10/29/2015 1404h	11/4/2015 1109h	E200.7	0.294	10.0	51.1	1
Manganese	7439-96-5	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.00153	0.00200	1.72	2
Mercury	7439-97-6	mg/L	11/3/2015 1710h	11/4/2015 1214h	E245.1	0.00000892	0.000150	0.000165	
Molybdenum	7439-98-7	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.000206	0.00200	0.00113	$\mathbf{J}^{\scriptscriptstyle 1}$
Nickel	7440-02-0	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.000754	0.00200	0.0446	
Potassium	7440-09-7	mg/L	10/29/2015 1404h	11/4/2015 1109h	E200.7	2.47	10.0	12.8	1
Selenium	7782-49-2	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.0000634	0.00200	0.000931	J\$
Silver	7440-22-4	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.0000244	0.00200	0.000287	J\$
Sodium	7440-23-5	mg/L	10/29/2015 1404h	11/4/2015 1109h	E200.7	0.330	10.0	49.7	1
Thallium	7440-28-0	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.0000242	0.00200	0.000797	J
Vanadium	7440-62-2	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.000438	0.00440	0.0586	В
Zinc	7440-66-6	mg/L	10/29/2015 1404h	11/3/2015 1650h	E200.8	0.00476	0.00500	0.191	

<sup>\$</sup> - Sample concentration too low for serial dilution evaluation.

Lab Set ID: 1510566

 $<sup>@-</sup>High\ RPD\ due\ to\ suspected\ sample\ non-homogeneity\ or\ matrix\ interference.$ 

 $<sup>\</sup>S-Post\ digestion\ spike\ (PDS)\ recovery\ indicates\ matrix\ interference.$ 

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

B - This analyte was also detected in the method blank below the PQL.

J - Estimated value between the MDL and the reporting limit (PQL).



### 3440 South 700 West Salt Lake City, UT 84119

Kyle F. Gross Laboratory Director

Report Date: 11/30/2015 Page 15 of 487

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

Jose Rocha QA Officer

e-mail: awal@awal-labs.com, web: www.awal-labs.com

### **INORGANIC ANALYTICAL REPORT**

Client: Utah Division of Water Quality Contact: Jim Harris

**Project:** Gold King Mine Spill / 01255.1.016.03

 Lab Sample ID:
 1510566-012

 Client Sample ID:
 GK01-ST-12

 Collection Date:
 10/15/2015 000h

 Received Date:
 10/27/2015 1525h

**Analytical Results** 

Compound	CAS	Units	Date Prepared	Date Analyzed	Method Used	MDL	Reporting Limit	Analytical Result	Qual
Alkalinity (as CaCO3)		mg/L		10/29/2015 824h	SM2320B	1.86	10.0	156	
Bicarbonate (as CaCO3)		mg/L		10/29/2015 824h	SM2320B	1.86	10.0	156	
Carbonate (as CaCO3)		mg/L		10/29/2015 824h	SM2320B	1.86	10.0	< 10.0	U
Chloride	16887-00-6	mg/L		10/30/2015 159h	E300.0	0.0751	1.00	15.7	
Conductivity		μmhos/cm		10/29/2015 750h	SM2510B	0.436	2.00	907	
Hardness (as CaCO3)		mg/L		11/10/2015 1123h	SM2340B	10.0	10.0	1,420	
Nitrate/Nitrite (as N)	7727-37-9	mg/L		11/6/2015 2101h	E353.2	0.833	1.00	22.4	
рН @ 25° С		pH Units		10/28/2015 1814h	SM4500-H+B	1.00	1.00	7.39	Н
Phosphate, Total (as P)	7723-14-0	mg/L	11/2/2015 1400h	11/2/2015 1717h	SM4500-P-F	0.0212	0.0500	3.80	1@
Sulfate	14808-79-8	mg/L		10/30/2015 017h	E300.0	2.11	75.0	202	
Total Dissolved Solids		mg/L		10/29/2015 1110h	SM2540C	61.3	100	900	H@
Total Suspended Solids	TSS	mg/L		10/29/2015 1430h	SM2540D	47.2	50.0	14,500	H@

<sup>@ -</sup> High RPD due to suspected sample non-homogeneity or matrix interference.

Lab Set ID: 1510566

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

 $<sup>{\</sup>it H}$  - Sample was received outside of the holding time.

 $<sup>\</sup>label{lem:update} \textit{U-This flag indicates the compound was analyzed for but not detected above the MDL.}$ 



### SECTION 3.

### □ BATCH QC REPORTS

### □ METHOD BLANK (MB) REPORTS

- □ Raw data matches method blank reports.
- □ Any results greater than the contract required detection limit are flagged.

### □ LABORATORY CONTROL SAMPLE (LCS) REPORTS

- □ Raw data matches LCS reports.
- □ Any results outside the control limits are flagged.

### MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD) REPORTS

- □ Raw data matches MS/MSD reports.
- ☐ Any results outside the control limits are flagged and qualified.

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686 Toll Free: (888) 263-8686 Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha

QA Officer

### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME **QC Type:** LCS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	LCS-40001	Date Analyzed:	11/04/20	15 1107h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Calcium		9.94	mg/L	E200.7	0.0401	1.00	10.00	0	99.4	85 - 115				
Iron		0.993	mg/L	E200.7	0.0767	0.100	1.000	0	99.3	85 - 115				
Magnesium		10.4	mg/L	E200.7	0.0294	1.00	10.00	0	104	85 - 115				
Potassium		10.1	mg/L	E200.7	0.247	1.00	10.00	0	101	85 - 115				
Sodium		10.0	mg/L	E200.7	0.0330	1.00	10.00	0	100	85 - 115				
Lab Sample ID:	LCS-40001	Date Analyzed:	11/04/20	15 1630h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Aluminum		0.987	mg/L	E200.7	0.0237	0.100	1.000	0	98.7	85 - 115				
Lab Sample ID:	LCS-40002	Date Analyzed:	11/03/20	15 1647h										
Test Code:	200.8-W	Date Prepared:	10/29/20	15 1404h										
Antimony		0.181	mg/L	E200.8	0.0000366	0.00200	0.2000	0	90.7	85 - 115				
Arsenic		0.203	mg/L	E200.8	0.0000920	0.00200	0.2000	0	101	85 - 115				
Barium		0.192	mg/L	E200.8	0.000538	0.00200	0.2000	0	96.0	85 - 115				
Beryllium		0.204	mg/L	E200.8	0.0000288	0.00200	0.2000	0	102	85 - 115				
Cadmium		0.196	mg/L	E200.8	0.000193	0.000500	0.2000	0	97.9	85 - 115				
Chromium		0.197	mg/L	E200.8	0.00154	0.00200	0.2000	0	98.5	85 - 115				
Cobalt		0.194	mg/L	E200.8	0.0000434	0.00400	0.2000	0	96.8	85 - 115				
Copper		0.196	mg/L	E200.8	0.000692	0.00200	0.2000	0	98.0	85 - 115				
Lead		0.190	mg/L	E200.8	0.000264	0.00200	0.2000	0	95.1	85 - 115				
Manganese		0.196	mg/L	E200.8	0.00153	0.00200	0.2000	0	97.8	85 - 115				
Molybdenum		0.198	mg/L	E200.8	0.000206	0.00200	0.2000	0	99.0	85 - 115				
Nickel		0.194	mg/L	E200.8	0.000754	0.00200	0.2000	0	96.9	85 - 115				
Selenium		0.195	mg/L	E200.8	0.0000634	0.00200	0.2000	0	97.5	85 - 115				
Silver		0.170	mg/L	E200.8	0.0000244	0.00200	0.2000	0	85.2	85 - 115				
Thallium		0.186	mg/L	E200.8	0.0000242	0.00200	0.2000	0	92.9	85 - 115				
Vanadium		0.201	mg/L	E200.8	0.000438	0.00440	0.2000	0	101	85 - 115				
Zinc		0.994	mg/L	E200.8	0.00476	0.00500	1.000	0	99.4	85 - 115				



Analyte

Test Code:

Mercury

### 3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha **QA** Officer

### **QC SUMMARY REPORT**

MDL

0.00000892

Reporting

Limit

0.000150

Utah Division of Water Quality Client:

HG-DW-245.1

**Lab Set ID:** 1510566

Lab Sample ID: LCS-40063

**Project:** 

Gold King Mine Spill / 01255.1.016.03

Result

0.00344

Date Analyzed:

Date Prepared:

Units

mg/L

11/04/2015 1149h

11/03/2015 1710h

Method

E245.1

Contact: Jim Harris

0

103

ME Dept: QC Type: LCS

0.003330

Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual

85 - 115

All analyses applicable to the CWA, SDWA, and RCRA are performed in accordance to NELAC protocols. Pertinent sampling information is located on the attached COC. Confidential Business Information: This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

Lab Set ID: 1510566 American West Analytical Laboratories Report Date: 11/30/2015 Page 18 of 487

3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME

QC Type: MBLK

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	MB-40001	Date Analyzed:	11/04/20	15 1105h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Calcium		< 1.00	mg/L	E200.7	0.0401	1.00								U
Iron		< 0.100	mg/L	E200.7	0.0767	0.100								U
Magnesium		< 1.00	mg/L	E200.7	0.0294	1.00								U
Potassium		< 1.00	mg/L	E200.7	0.247	1.00								U
Sodium		< 1.00	mg/L	E200.7	0.0330	1.00								U
Lab Sample ID:	MB-40001	Date Analyzed:	11/04/20	15 1628h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Aluminum		< 0.100	mg/L	E200.7	0.0237	0.100								U
Lab Sample ID:	MB-40002	Date Analyzed:	11/03/20	15 1644h										
Test Code:	200.8-W	Date Prepared:	10/29/20	15 1404h										
Antimony		< 0.00200	mg/L	E200.8	0.0000366	0.00200								U
Arsenic		< 0.00200	mg/L	E200.8	0.0000920	0.00200								U
Barium		< 0.00200	mg/L	E200.8	0.000538	0.00200								U
Beryllium		< 0.00200	mg/L	E200.8	0.0000288	0.00200								U
Cadmium		< 0.000500	mg/L	E200.8	0.000193	0.000500								U
Chromium		< 0.00200	mg/L	E200.8	0.00154	0.00200								U
Cobalt		< 0.00400	mg/L	E200.8	0.0000434	0.00400								U
Copper		< 0.00200	mg/L	E200.8	0.000692	0.00200								U
Lead		< 0.00200	mg/L	E200.8	0.000264	0.00200								U
Manganese		< 0.00200	mg/L	E200.8	0.00153	0.00200								U
Molybdenum		< 0.00200	mg/L	E200.8	0.000206	0.00200								U
Nickel		< 0.00200	mg/L	E200.8	0.000754	0.00200								U
Selenium		< 0.00200	mg/L	E200.8	0.0000634	0.00200								U
Silver		< 0.00200	mg/L	E200.8	0.0000244	0.00200								U
Thallium		< 0.00200	mg/L	E200.8	0.0000242	0.00200								U
Vanadium		0.00251	mg/L	E200.8	0.000438	0.00440								JB
Zinc		< 0.00500	mg/L	E200.8	0.00476	0.00500								U



3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

Lab Set ID: 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME

QC Type: MBLK

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	MB-40063	Date Analyzed:	11/04/20	5 1148h										
Test Code:	HG-DW-245.1	Date Prepared:	11/03/201	5 1710h										
Mercury		< 0.000150	mg/L	E245.1	0.00000892	0.000150								U

B - This analyte was also detected in the method blank below the PQL.

All analyses applicable to the CWA, SDWA, and RCRA are performed in accordance to NELAC protocols. Pertinent sampling information is located on the attached COC. Confidential Business Information: This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connoction with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

Lab Set ID: 1510566 American West Analytical Laboratories Report Date: 11/30/2015 Page 20 of 487

 $<sup>\</sup>it J$  - Estimated value between the MDL and the reporting limit (PQL).

U - This flag indicates the compound was analyzed for but not detected above the MDL.

### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME **QC Type:** MS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	1510566-013AMS	Date Analyzed:	11/04/20	15 1116h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Calcium		196	mg/L	E200.7	0.401	10.0	10.00	261	-650	70 - 130				2
Iron		34.5	mg/L	E200.7	0.767	1.00	1.000	46.3	-1,190	70 - 130				2
Magnesium		47.8	mg/L	E200.7	0.294	10.0	10.00	51.1	-32.8	70 - 130				1
Potassium		20.1	mg/L	E200.7	2.47	10.0	10.00	12.8	73.2	70 - 130				
Sodium		59.4	mg/L	E200.7	0.330	10.0	10.00	49.7	97.6	70 - 130				
Lab Sample ID:	1510567-013AMS	Date Analyzed:	11/04/20	15 1134h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Calcium		122	mg/L	E200.7	0.401	10.0	10.00	112	100	70 - 130				
Iron		16.3	mg/L	E200.7	0.767	1.00	1.000	15	137	70 - 130				2
Magnesium		35.5	mg/L	E200.7	0.294	10.0	10.00	24.8	107	70 - 130				
Sodium		58.2	mg/L	E200.7	0.330	10.0	10.00	46.9	113	70 - 130				
Lab Sample ID:	1510567-013AMS	Date Analyzed:	11/04/20	15 1149h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Potassium		17.4	mg/L	E200.7	0.247	1.00	10.00	6.51	109	70 - 130				
Lab Sample ID:	1510566-013AMS	Date Analyzed:	11/04/20	15 1635h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Aluminum		36.8	mg/L	E200.7	0.237	1.00	1.000	40.8	-399	70 - 130				2
Lab Sample ID:	1510567-013AMS	Date Analyzed:	11/04/20	15 1643h										
Test Code:	200.7-W	Date Prepared:	10/29/20	15 1404h										
Aluminum		22.2	mg/L	E200.7	0.237	1.00	1.000	16.4	586	70 - 130				2
Lab Sample ID:	1510566-013AMS	Date Analyzed:	11/03/20	15 1700h										
Test Code:	200.8-W	Date Prepared:	10/29/20	15 1404h										
Antimony		0.0352	mg/L	E200.8	0.0000366	0.00200	0.2000	0.000857	17.2	75 - 125				1
Arsenic		0.193	mg/L	E200.8	0.0000920	0.00200	0.2000	0.0123	90.6	75 - 125				
Barium		0.922	mg/L	E200.8	0.000538	0.00200	0.2000	1.15	-115	75 - 125				2

### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME **QC Type:** MS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	1510566-013AMS	Date Analyzed:	11/03/20	15 1700h										
Test Code:	200.8-W	Date Prepared:	10/29/20	15 1404h										
Beryllium		0.189	mg/L	E200.8	0.0000288	0.00200	0.2000	0.00305	93.0	75 - 125				
Cadmium		0.193	mg/L	E200.8	0.000193	0.000500	0.2000	0.00117	96.1	75 - 125				
Chromium		0.211	mg/L	E200.8	0.00154	0.00200	0.2000	0.0287	91.0	75 - 125				
Cobalt		0.203	mg/L	E200.8	0.0000434	0.00400	0.2000	0.0274	87.7	75 - 125				
Copper		0.221	mg/L	E200.8	0.000692	0.00200	0.2000	0.0563	82.3	75 - 125				
Lead		0.216	mg/L	E200.8	0.000264	0.00200	0.2000	0.0461	84.9	75 - 125				
Manganese		1.16	mg/L	E200.8	0.00153	0.00200	0.2000	1.72	-283	75 - 125				2
Molybdenum		0.142	mg/L	E200.8	0.000206	0.00200	0.2000	0.00113	70.4	75 - 125				1
Nickel		0.215	mg/L	E200.8	0.000754	0.00200	0.2000	0.0446	85.3	75 - 125				
Selenium		0.170	mg/L	E200.8	0.0000634	0.00200	0.2000	0.000931	84.6	75 - 125				
Silver		0.187	mg/L	E200.8	0.0000244	0.00200	0.2000	0.000287	93.3	75 - 125				
Thallium		0.179	mg/L	E200.8	0.0000242	0.00200	0.2000	0.000797	89.0	75 - 125				
Vanadium		0.234	mg/L	E200.8	0.000438	0.00440	0.2000	0.0586	87.7	75 - 125				
Zinc		1.06	mg/L	E200.8	0.00476	0.00500	1.000	0.191	86.7	75 - 125				
Lab Sample ID:	1510567-013AMS	Date Analyzed:	11/03/20	15 1719h										
Test Code:	200.8-W	Date Prepared:	10/29/20	15 1404h										
Antimony		0.0800	mg/L	E200.8	0.0000366	0.00200	0.2000	0.000611	39.7	75 - 125				1
Arsenic		0.198	mg/L	E200.8	0.0000920	0.00200	0.2000	0.00546	96.4	75 - 125				
Barium		0.475	mg/L	E200.8	0.000538	0.00200	0.2000	0.327	73.8	75 - 125				1
Beryllium		0.190	mg/L	E200.8	0.0000288	0.00200	0.2000	0.000991	94.6	75 - 125				
Cadmium		0.191	mg/L	E200.8	0.000193	0.000500	0.2000	0.000313	95.2	75 - 125				
Chromium		0.199	mg/L	E200.8	0.00154	0.00200	0.2000	0.00918	94.9	75 - 125				
Cobalt		0.194	mg/L	E200.8	0.0000434	0.00400	0.2000	0.00708	93.5	75 - 125				
Copper		0.204	mg/L	E200.8	0.000692	0.00200	0.2000	0.0193	92.4	75 - 125				
Lead		0.196	mg/L	E200.8	0.000264	0.00200	0.2000	0.0134	91.2	75 - 125				
Manganese		0.573	mg/L	E200.8	0.00153	0.00200	0.2000	0.416	78.4	75 - 125				
Molybdenum		0.171	mg/L	E200.8	0.000206	0.00200	0.2000	0.00121	84.7	75 - 125				
Nickel		0.197	mg/L	E200.8	0.000754	0.00200	0.2000	0.0112	92.9	75 - 125				

### 3440 South 700 West

### Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME **QC Type:** MS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	1510567-013AMS	Date Analyzed:	11/03/201	5 1719h										
Test Code:	200.8-W	Date Prepared:	10/29/201	5 1404h										
Selenium		0.180	mg/L	E200.8	0.0000634	0.00200	0.2000	0.000975	89.7	75 - 125				
Silver		0.167	mg/L	E200.8	0.0000244	0.00200	0.2000	0.000141	83.3	75 - 125				
Thallium		0.179	mg/L	E200.8	0.0000242	0.00200	0.2000	0.000246	89.4	75 - 125				
Zinc		1.01	mg/L	E200.8	0.00476	0.00500	1.000	0.0539	95.3	75 - 125				
Lab Sample ID:	1510567-013AMS	Date Analyzed:	11/04/201	5 1503h										
Test Code:	200.8-W	Date Prepared:	10/29/201	5 1404h										
Vanadium		0.214	mg/L	E200.8	0.000438	0.00440	0.2000	0.0249	94.7	75 - 125				
Lab Sample ID:	1510563-007AMS	Date Analyzed:	11/04/201	5 1157h										
Test Code:	HG-DW-245.1	Date Prepared:	11/03/201	5 1710h										
Mercury		0.00376	mg/L	E245.1	0.00000892	0.000150	0.003330	0.000147	109	80 - 120				
Lab Sample ID:	1510566-013AMS	Date Analyzed:	11/04/201	5 1216h										
Test Code:	HG-DW-245.1	Date Prepared:	11/03/201	5 1710h										
Mercury		0.00357	mg/L	E245.1	0.00000892	0.000150	0.003330	0.000165	102	80 - 120				
Lab Sample ID:	1510567-013AMS	Date Analyzed:	11/04/201	5 1221h										
Test Code:	HG-DW-245.1	Date Prepared:	11/03/201	5 1710h										
Mercury		0.00345	mg/L	E245.1	0.00000892	0.000150	0.003330	0.0000133	103	80 - 120				
Lab Sample ID:	1510580-003AMS	Date Analyzed:	11/04/201	5 1230h										
Test Code:	HG-DW-245.1	Date Prepared:	11/03/201	5 1710h										
Mercury		0.00347	mg/L	E245.1	0.00000892	0.000150	0.003330	0.0000717	102	80 - 120				
				·		·	·					· ·		

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

### 3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME **QC Type:** MSD

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>1510566-013AMSD</b> 200.7-W	Date Analyzed: Date Prepared:	11/04/201 10/29/201											
Calcium		162	mg/L	E200.7	0.401	10.0	10.00	261	-987	70 - 130	196	18.8	20	2
Iron		26.1	mg/L	E200.7	0.767	1.00	1.000	46.3	-2,020	70 - 130	34.5	27.5	20	2
Magnesium		41.0	mg/L	E200.7	0.294	10.0	10.00	51.1	-101	70 - 130	47.8	15.3	20	1
Potassium		19.0	mg/L	E200.7	2.47	10.0	10.00	12.8	61.8	70 - 130	20.1	5.84	20	1
Sodium		56.6	mg/L	E200.7	0.330	10.0	10.00	49.7	69.8	70 - 130	59.4	4.79	20	1
Lab Sample ID: Test Code:	<b>1510567-013AMSD</b> 200.7-W	Date Analyzed: Date Prepared:	11/04/201 10/29/201											
Calcium		116	mg/L	E200.7	0.401	10.0	10.00	112	41.1	70 - 130	122	4.96	20	2
Iron		16.2	mg/L	E200.7	0.767	1.00	1.000	15	127	70 - 130	16.3	0.614	20	
Magnesium		34.3	mg/L	E200.7	0.294	10.0	10.00	24.8	94.6	70 - 130	35.5	3.62	20	
Sodium		55.4	mg/L	E200.7	0.330	10.0	10.00	46.9	85.3	70 - 130	58.2	4.81	20	
Lab Sample ID: Test Code:	<b>1510567-013AMSD</b> 200.7-W	Date Analyzed: Date Prepared:	11/04/201 10/29/201											
Potassium		16.9	mg/L	E200.7	0.247	1.00	10.00	6.51	104	70 - 130	17.4	2.90	20	
Lab Sample ID: Test Code:	<b>1510566-013AMSD</b> 200.7-W	Date Analyzed: Date Prepared:	11/04/201 10/29/201											
Aluminum		31.3	mg/L	E200.7	0.237	1.00	1.000	40.8	-952	70 - 130	36.8	16.2	20	2
Lab Sample ID: Test Code:	<b>1510567-013AMSD</b> 200.7-W	Date Analyzed: Date Prepared:	11/04/201 10/29/201											
Aluminum		22.4	mg/L	E200.7	0.237	1.00	1.000	16.4	600	70 - 130	22.2	0.622	20	2
Lab Sample ID: Test Code:	<b>1510566-013AMSD</b> 200.8-W	Date Analyzed: Date Prepared:	11/03/201 10/29/201											
Antimony		0.0485	mg/L	E200.8	0.0000366	0.00200	0.2000	0.000857	23.8	75 - 125	0.0352	31.8	20	1@
Arsenic		0.196	mg/L	E200.8	0.0000920	0.00200	0.2000	0.0123	91.9	75 - 125	0.193	1.37	20	~
Arsenic														

### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** ME **QC Type:** MSD

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>1510566-013AMSD</b> 200.8-W	Date Analyzed: Date Prepared:	11/03/201 10/29/201											
Beryllium		0.191	mg/L	E200.8	0.0000288	0.00200	0.2000	0.00305	94.1	75 - 125	0.189	1.17	20	
Cadmium		0.193	mg/L	E200.8	0.000193	0.000500	0.2000	0.00117	96.0	75 - 125	0.193	0.0550	20	
Chromium		0.208	mg/L	E200.8	0.00154	0.00200	0.2000	0.0287	89.7	75 - 125	0.211	1.25	20	
Cobalt		0.200	mg/L	E200.8	0.0000434	0.00400	0.2000	0.0274	86.2	75 - 125	0.203	1.46	20	
Copper		0.215	mg/L	E200.8	0.000692	0.00200	0.2000	0.0563	79.1	75 - 125	0.221	2.95	20	
Lead		0.208	mg/L	E200.8	0.000264	0.00200	0.2000	0.0461	80.7	75 - 125	0.216	3.98	20	
Manganese		0.844	mg/L	E200.8	0.00153	0.00200	0.2000	1.72	-439	75 - 125	1.16	31.1	20	2
Molybdenum		0.153	mg/L	E200.8	0.000206	0.00200	0.2000	0.00113	76.1	75 - 125	0.142	7.81	20	
Nickel		0.207	mg/L	E200.8	0.000754	0.00200	0.2000	0.0446	81.1	75 - 125	0.215	4.02	20	
Selenium		0.177	mg/L	E200.8	0.0000634	0.00200	0.2000	0.000931	88.0	75 - 125	0.17	3.91	20	
Silver		0.163	mg/L	E200.8	0.0000244	0.00200	0.2000	0.000287	81.3	75 - 125	0.187	13.7	20	
Thallium		0.180	mg/L	E200.8	0.0000242	0.00200	0.2000	0.000797	89.8	75 - 125	0.179	0.886	20	
Zinc		1.04	mg/L	E200.8	0.00476	0.00500	1.000	0.191	85.1	75 - 125	1.06	1.51	20	
Lab Sample ID:	1510567-013AMSD	Date Analyzed:	11/03/201	5 1722h										
Test Code:	200.8-W	Date Prepared:	10/29/201	5 1404h										
Antimony		0.0853	mg/L	E200.8	0.0000366	0.00200	0.2000	0.000611	42.4	75 125	0.08	6.47	20	1
Arsenic					0.0000300	0.00200	0.2000	0.000011	42.4	75 - 125	0.08	0.47		
		0.201	mg/L	E200.8	0.0000920	0.00200	0.2000	0.00546	97.7	75 - 125 75 - 125	0.08	1.28	20	
Barium		0.201 0.478	mg/L mg/L											
Barium Beryllium			-	E200.8	0.0000920	0.00200	0.2000	0.00546	97.7	75 - 125	0.198	1.28	20	
		0.478	mg/L	E200.8 E200.8	0.0000920 0.000538	0.00200 0.00200	0.2000 0.2000	0.00546 0.327	97.7 75.1	75 - 125 75 - 125	0.198 0.475	1.28 0.561	20 20	
Beryllium		0.478 0.189	mg/L mg/L mg/L	E200.8 E200.8 E200.8	0.0000920 0.000538 0.0000288	0.00200 0.00200 0.00200	0.2000 0.2000 0.2000	0.00546 0.327 0.000991	97.7 75.1 94.1	75 - 125 75 - 125 75 - 125	0.198 0.475 0.19	1.28 0.561 0.466	20 20 20	
Beryllium Cadmium		0.478 0.189 0.191	mg/L mg/L	E200.8 E200.8 E200.8 E200.8	0.0000920 0.000538 0.0000288 0.000193	0.00200 0.00200 0.00200 0.000500	0.2000 0.2000 0.2000 0.2000	0.00546 0.327 0.000991 0.000313	97.7 75.1 94.1 95.4	75 - 125 75 - 125 75 - 125 75 - 125	0.198 0.475 0.19 0.191	1.28 0.561 0.466 0.120	20 20 20 20	
Beryllium Cadmium Chromium		0.478 0.189 0.191 0.199	mg/L mg/L mg/L mg/L	E200.8 E200.8 E200.8 E200.8 E200.8	0.0000920 0.000538 0.0000288 0.000193 0.00154	0.00200 0.00200 0.00200 0.000500 0.00200	0.2000 0.2000 0.2000 0.2000 0.2000	0.00546 0.327 0.000991 0.000313 0.00918	97.7 75.1 94.1 95.4 94.7	75 - 125 75 - 125 75 - 125 75 - 125 75 - 125	0.198 0.475 0.19 0.191 0.199	1.28 0.561 0.466 0.120 0.244	20 20 20 20 20 20	
Beryllium Cadmium Chromium Cobalt		0.478 0.189 0.191 0.199 0.193	mg/L mg/L mg/L mg/L mg/L	E200.8 E200.8 E200.8 E200.8 E200.8 E200.8	0.0000920 0.000538 0.0000288 0.000193 0.00154 0.0000434	0.00200 0.00200 0.00200 0.000500 0.00200 0.00400	0.2000 0.2000 0.2000 0.2000 0.2000 0.2000	0.00546 0.327 0.000991 0.000313 0.00918 0.00708	97.7 75.1 94.1 95.4 94.7 92.9	75 - 125 75 - 125 75 - 125 75 - 125 75 - 125 75 - 125	0.198 0.475 0.19 0.191 0.199 0.194	1.28 0.561 0.466 0.120 0.244 0.579	20 20 20 20 20 20 20	
Beryllium Cadmium Chromium Cobalt Copper		0.478 0.189 0.191 0.199 0.193 0.204	mg/L mg/L mg/L mg/L mg/L	E200.8 E200.8 E200.8 E200.8 E200.8 E200.8 E200.8	0.0000920 0.000538 0.0000288 0.000193 0.00154 0.0000434 0.000692	0.00200 0.00200 0.00200 0.000500 0.00200 0.00400 0.00200	0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000	0.00546 0.327 0.000991 0.000313 0.00918 0.00708 0.0193	97.7 75.1 94.1 95.4 94.7 92.9 92.4	75 - 125 75 - 125 75 - 125 75 - 125 75 - 125 75 - 125 75 - 125	0.198 0.475 0.19 0.191 0.199 0.194 0.204	1.28 0.561 0.466 0.120 0.244 0.579 0.0726	20 20 20 20 20 20 20 20	1
Beryllium Cadmium Chromium Cobalt Copper Lead		0.478 0.189 0.191 0.199 0.193 0.204 0.197	mg/L mg/L mg/L mg/L mg/L mg/L	E200.8 E200.8 E200.8 E200.8 E200.8 E200.8 E200.8 E200.8	0.0000920 0.000538 0.0000288 0.000193 0.00154 0.0000434 0.000692 0.000264	0.00200 0.00200 0.00200 0.000500 0.00200 0.00400 0.00200 0.00200	0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000	0.00546 0.327 0.000991 0.000313 0.00918 0.00708 0.0193 0.0134	97.7 75.1 94.1 95.4 94.7 92.9 92.4 92.0	75 - 125 75 - 125	0.198 0.475 0.19 0.191 0.199 0.194 0.204 0.196	1.28 0.561 0.466 0.120 0.244 0.579 0.0726 0.821	20 20 20 20 20 20 20 20 20	1
Beryllium Cadmium Chromium Cobalt Copper Lead Manganese		0.478 0.189 0.191 0.199 0.193 0.204 0.197 0.557	mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	E200.8 E200.8 E200.8 E200.8 E200.8 E200.8 E200.8 E200.8 E200.8	0.0000920 0.000538 0.0000288 0.000193 0.00154 0.0000434 0.000692 0.000264 0.00153	0.00200 0.00200 0.00200 0.000500 0.00200 0.00400 0.00200 0.00200 0.00200	0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000	0.00546 0.327 0.000991 0.000313 0.00918 0.00708 0.0193 0.0134 0.416	97.7 75.1 94.1 95.4 94.7 92.9 92.4 92.0 70.2	75 - 125 75 - 125	0.198 0.475 0.19 0.191 0.199 0.194 0.204 0.196 0.573	1.28 0.561 0.466 0.120 0.244 0.579 0.0726 0.821 2.88	20 20 20 20 20 20 20 20 20 20	1

### 3440 South 700 West

### Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

Contact: Jim Harris

**Dept:** ME **QC Type:** MSD

015 1722h 015 1404h E200.8 0.0000244 0.00200 0.2000 0.000141 74.5 75 - 125 0.167 11.2 20 2 E200.8 0.0000242 0.00200 0.2000 0.000246 89.8 75 - 125 0.179 0.433 20 E200.8 0.00476 0.00500 1.000 0.0539 95.2 75 - 125 1.01 0.0722 20 015 1507h 015 1404h	Da Da
E200.8 0.0000244 0.00200 0.2000 0.000141 74.5 75 - 125 0.167 11.2 20 2 E200.8 0.0000242 0.00200 0.2000 0.000246 89.8 75 - 125 0.179 0.433 20 E200.8 0.00476 0.00500 1.000 0.0539 95.2 75 - 125 1.01 0.0722 20	Da
E200.8 0.0000242 0.00200 0.2000 0.000246 89.8 75 - 125 0.179 0.433 20 E200.8 0.00476 0.00500 1.000 0.0539 95.2 75 - 125 1.01 0.0722 20	
E200.8 0.00476 0.00500 1.000 0.0539 95.2 75 - 125 1.01 0.0722 20 015 1507h	
015 1507h	
015 1404h	Da
	Da
E200.8 0.000438 0.00440 0.2000 0.0249 94.0 75 - 125 0.219 2.82 20	
015 1519h	Da
015 1404h	Da
E200.8 0.000438 0.00440 0.2000 0.0586 102 75 - 125 0.234 11.8 20	
015 1158h	Da
015 1710h	Da
E245.1 0.00000892 0.000150 0.003330 0.000147 109 80 - 120 0.00376 0.574 20	0
015 1218h	Da
015 1710h	Da
E245.1 0.00000892 0.000150 0.003330 0.000165 101 80 - 120 0.00357 1.69 20	0
015 1223h	Da
015 1710h	Da
E245.1 0.00000892 0.000150 0.003330 0.0000133 101 80 - 120 0.00345 1.90 20	0
015 1232h	Da
015 1710h	Da
E245.1 0.00000892 0.000150 0.003330 0.0000717 108 80 - 120 0.00347 5.24 20	0
E200.8 0.000438 0.00440 0.2000 0.0586 102 75 - 125 0.234 11.8 20  015 1158h 015 1710h  E245.1 0.00000892 0.000150 0.003330 0.000147 109 80 - 120 0.00376 0.574 20  015 1218h 015 1710h  E245.1 0.00000892 0.000150 0.003330 0.000165 101 80 - 120 0.00357 1.69 20  015 1223h 015 1710h  E245.1 0.00000892 0.000150 0.003330 0.000165 101 80 - 120 0.00357 1.69 20  015 1223h 015 1710h	Daa Daa Daa Daa Daa Daa Daa Daa

<sup>@ -</sup> High RPD due to suspected sample non-homogeneity or matrix interference.

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** WC

QC Type: DUP

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>1510561-018ADUP</b> COND-W-2510B	Date Analyze	d: 10/29/20	15 750h										
Conductivity		899	μmhos/cm	SM2510B	0.436	2.00					898	0.111	5	
Lab Sample ID: Test Code:	<b>1510563-006ADUP</b> COND-W-2510B	Date Analyze	d: 10/29/20	15 750h										
Conductivity		925	μmhos/cm	SM2510B	0.436	2.00					927	0.216	5	
Lab Sample ID: Test Code:	<b>1510566-012ADUP</b> COND-W-2510B	Date Analyze	d: 10/29/20	15 750h										
Conductivity		909	μmhos/cm	SM2510B	0.436	2.00					907	0.220	5	
Lab Sample ID: Test Code:	<b>1510567-012ADUP</b> COND-W-2510B	Date Analyze	d: 10/29/20	15 750h										
Conductivity		890	μmhos/cm	SM2510B	0.436	2.00					891	0.112	5	
Lab Sample ID: Test Code:	<b>1510561-018ADUP</b> PH-4500H+B	Date Analyze	d: 10/28/20	15 1814h										
рН @ 25° С		6.99	pH Units	SM4500-H+B	1.00	1.00					7.04	0.713	5	Н
Lab Sample ID: Test Code:	<b>1510563-006ADUP</b> PH-4500H+B	Date Analyze	d: 10/28/20	15 1814h										
рН @ 25° С		7.47	pH Units	SM4500-H+B	1.00	1.00					7.5	0.401	5	Н
Lab Sample ID: Test Code:	<b>1510563-021ADUP</b> PH-4500H+B	Date Analyze	d: 10/28/20	15 1814h										
рН @ 25° С	,	7.53	pH Units	SM4500-H+B	1.00	1.00					7.52	0.133	5	Н
Lab Sample ID: Test Code:	<b>1510566-012ADUP</b> PH-4500H+B	Date Analyze	d: 10/28/20	15 1814h										
рН @ 25° С		7.40	pH Units	SM4500-H+B	1.00	1.00					7.39	0.135	5	Н

### 3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** WC **QC Type:** DUP

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:         1510567-012ADUP           Test Code:         PH-4500H+B	Date Analyzed:	10/28/20	15 1814h										
рН @ 25° С	7.49	pH Units	SM4500-H+B	1.00	1.00					7.45	0.535	5	Н
Lab Sample ID:1510561-018ADUPTest Code:TDS-W-2540C	Date Analyzed:	10/29/20	15 1110h										
Total Dissolved Solids	600	mg/L	SM2540C	61.3	100					700	15.4	5	H@
Lab Sample ID:1510563-021ADUPTest Code:TDS-W-2540C	Date Analyzed:	10/29/20	15 1110h										
Total Dissolved Solids	980	mg/L	SM2540C	61.3	100					1000	2.02	5	Н
Lab Sample ID:1510566-012ADUPTest Code:TDS-W-2540C	Date Analyzed:	10/29/20	15 1110h										
Total Dissolved Solids	680	mg/L	SM2540C	61.3	100					900	27.8	5	H@
Lab Sample ID:1510567-012ADUPTest Code:TDS-W-2540C	Date Analyzed:	10/29/20	15 1110h										
Total Dissolved Solids	780	mg/L	SM2540C	61.3	100					760	2.60	5	Н
Lab Sample ID:1510561-018ADUPTest Code:TSS-W-2540D	Date Analyzed:	10/29/20	15 1430h										
Total Suspended Solids	918	mg/L	SM2540D	14.2	15.0					1020	10.1	5	H@
Lab Sample ID: 1510563-021ADUP Test Code: TSS-W-2540D	Date Analyzed:	10/29/20	15 1430h										
Total Suspended Solids	58,100	mg/L	SM2540D	142	150					59300	2.04	5	Н
Lab Sample ID:1510566-012ADUPTest Code:TSS-W-2540D	Date Analyzed:	10/29/20	15 1430h										
Total Suspended Solids	16,100	mg/L	SM2540D	47.2	50.0					14500	10.6	5	H@



### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **OC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

Contact: Jim Harris

**Dept:** WC **QC Type:** DUP

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:1510567-012ADUPTest Code:TSS-W-2540D	Date Analyzed:	10/29/201	5 1430h										
Total Suspended Solids	1,840	mg/L	SM2540D	35.4	37.5					1930	4.79	5	Н
Lab Sample ID:1510580-001CDUPTest Code:TSS-W-2540D	Date Analyzed:	10/29/201	5 1430h										
Total Suspended Solids	2,960	mg/L	SM2540D	70.8	75.0					2820	4.84	5	

<sup>@ -</sup> High RPD due to suspected sample non-homogeneity or matrix interference.

All analyses applicable to the CWA, SDWA, and RCRA are performed in accordance to NELAC protocols. Pertinent sampling information is located on the attached COC. Confidential Business Information: This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

Lab Set ID: 1510566 American West Analytical Laboratories Report Date: 11/30/2015 Page 29 of 487

H - Sample was received outside of the holding time.

### 3440 South 700 West

### Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** WC **QC Type:** LCS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	LCS-R84575 300.0-W	Date Analyzed:	10/29/20	15 1319h										
Chloride		4.87	mg/L	E300.0	0.00751	0.100	5.000	0	97.4	90 - 110				
Sulfate		4.94	mg/L	E300.0	0.0211	0.750	5.000	0	98.8	90 - 110				
<b>Lab Sample ID:</b> Test Code:	LCS-R84502 ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as CaC	CO3)	49,900	mg/L	SM2320B	1.86	10.0	50,000	0	99.7	90 - 110				
Lab Sample ID: Test Code:	<b>LCS-R84497</b> COND-W-2510B	Date Analyzed:	10/29/20	15 750h										
Conductivity		995	umhos/cm	SM2510B	0.436	2.00	1,000	0	99.5	98 - 102				
Lab Sample ID: Test Code:	LCS-R84886 NO2/NO3-W-353.2	Date Analyzed:	11/06/20	15 2036h										
Nitrate/Nitrite (as	N)	1.02	mg/L	E353.2	0.00833	0.0100	1.000	0	102	90 - 110				
Lab Sample ID: Test Code:	LCS-R84485 PH-4500H+B	Date Analyzed:	10/28/20	15 1814h										
рН @ 25° С		8.91	pH Units	SM4500-H+B	1.00	1.00	9.000	0	99.0	98 - 102				
Lab Sample ID: Test Code:	LCS-40037 PO4-W-4500PF	Date Analyzed: Date Prepared:	11/02/20 11/02/20											
Phosphate, Total (	as P)	0.991	mg/L	SM4500-P-F	0.0212	0.0500	1.000	0	99.1	90 - 110				
Lab Sample ID: Test Code:	LCS-R84570 TDS-W-2540C	Date Analyzed:	10/29/20	15 1110h										
Total Dissolved So	olids	186	mg/L	SM2540C	6.13	10.0	205.0	0	90.7	80 - 120				
Lab Sample ID: Test Code:	<b>LCS-R84566</b> TSS-W-2540D	Date Analyzed:	10/29/20	15 1430h										
Total Suspended S	Solids	95.0	mg/L	SM2540D	2.83	3.00	100.0	0	95.0	80 - 120				

### 3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** WC **QC Type:** MBLK

RPD Ref. RPD Reporting Amount Spike Ref. MDL %REC % RPD Analyte Result Units Method Limit Spiked Amount Limits Amt Limit Qual Lab Sample ID: MB-R84575 Date Analyzed: 10/29/2015 1303h Test Code: 300.0-W 0.00751 U Chloride < 0.100 E300.0 0.100 mg/L U Sulfate < 0.750 E300.0 0.0211 0.750 mg/L Lab Sample ID: MB-R84502 Date Analyzed: 10/29/2015 824h Test Code: ALK-W-2320B SM2320B 10.0 U Alkalinity (as CaCO3) < 10.0 1.86 mg/L U Bicarbonate (as CaCO3) < 10.0 mg/L SM2320B 1.86 10.0 Carbonate (as CaCO3) < 10.0 mg/L SM2320B 1.86 10.0 U Lab Sample ID: MB-R84497 10/29/2015 750h Date Analyzed: Test Code: COND-W-2510B Conductivity < 2.00 µmhos/cm SM2510B 0.436 2.00 U Lab Sample ID: MB-R84886 Date Analyzed: 11/06/2015 2035h Test Code: NO2/NO3-W-353.2 U Nitrate/Nitrite (as N) < 0.0100 mg/L E353.2 0.00833 0.0100 Lab Sample ID: MB-40037 Date Analyzed: 11/02/2015 1645h Test Code: PO4-W-4500PF Date Prepared: 11/02/2015 1400h U Phosphate, Total (as P) < 0.0500 SM4500-P-F 0.0212 0.0500 mg/L Date Analyzed: Lab Sample ID: MB-R84570 10/29/2015 1110h Test Code: TDS-W-2540C 10.0 U Total Dissolved Solids < 10.0 mg/L SM2540C 6.13 Date Analyzed: 10/29/2015 1430h Lab Sample ID: MB-R84566 Test Code: TSS-W-2540D Total Suspended Solids < 3.00 mg/L SM2540D 2.83 3.00 U

All analyses applicable to the CWA, SDWA, and RCRA are performed in accordance to NELAC protocols. Pertinent sampling information is located on the attached COC. Confidential Business Information: This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the re-publication of this report in connection with the addressee. Privileges of subsequent use of the name of this company accepts no responsibility except for the due to the addressee. Privileges of subsequent use of the name of this company or any purpose other than for the addressee. Privileges of subsequent use of the name of this company or any purpose of the addressee. Privileges of the name of this company or any purpose of the addressee. Privileges of the name of this company or any purpose of the addressee. Privileges of the name of this company or any purpose of the addressee. Privileges of the name of this company or any purpose of the addressee. Privileges of the name of this company or any purpose of the addressee. Privileges of the name of this company or any purpose of the addressee. Privileges of the name of this company or any purpose of the name of this company or any purpose of the name of this company or any purpose of the name of this company or any purpose of the name of this

 $<sup>\</sup>it U$  - This flag indicates the compound was analyzed for but not detected above the MDL.

### 3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** WC **QC Type:** MS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>1510561-018AMS</b> 300.0-W	Date Analyzed:	10/29/20	15 2111h										
Chloride		499	mg/L	E300.0	0.751	10.0	500.0	15.8	96.7	90 - 110				
Sulfate		697	mg/L	E300.0	2.11	75.0	500.0	207	98.1	90 - 110				
Lab Sample ID: Test Code:	<b>1510563-006AMS</b> 300.0-W	Date Analyzed:	10/29/20	15 2202h										
Chloride		496	mg/L	E300.0	0.751	10.0	500.0	14.7	96.4	90 - 110				
Sulfate		630	mg/L	E300.0	2.11	75.0	500.0	141	97.9	90 - 110				
Lab Sample ID: Test Code:	<b>1510566-012AMS</b> 300.0-W	Date Analyzed:	10/30/20	15 033h										
Chloride		498	mg/L	E300.0	0.751	10.0	500.0	15.7	96.4	90 - 110				
Sulfate		689	mg/L	E300.0	2.11	75.0	500.0	202	97.5	90 - 110				
Lab Sample ID: Test Code:	<b>1510567-012AMS</b> 300.0-W	Date Analyzed:	10/30/20	15 124h										
Chloride		502	mg/L	E300.0	0.751	10.0	500.0	17.6	96.9	90 - 110				
Sulfate		696	mg/L	E300.0	2.11	75.0	500.0	205	98.3	90 - 110				
Lab Sample ID: Test Code:	<b>1510561-018AMS</b> ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as Ca	CO3)	193	mg/L	SM2320B	1.86	10.0	100.0	94.6	98.1	80 - 120				
Lab Sample ID: Test Code:	<b>1510563-006AMS</b> ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as Ca	CO3)	208	mg/L	SM2320B	1.86	10.0	100.0	110	98.0	80 - 120				
Lab Sample ID: Test Code:	<b>1510566-012AMS</b> ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as Ca	CO3)	260	mg/L	SM2320B	1.86	10.0	100.0	156	105	80 - 120	·	·		

### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

Contact: Jim Harris

**Dept:** WC **QC Type:** MS

Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Date Analyzed:	10/29/201	5 824h										
189	mg/L	SM2320B	1.86	10.0	100.0	87.9	101	80 - 120				
Date Analyzed:	10/29/201	5 824h										
238	mg/L	SM2320B	1.86	10.0	100.0	137	101	80 - 120				
Date Analyzed:	11/06/201	5 2057h										
122	mg/L	E353.2	0.833	1.00	100.0	18.6	103	90 - 110				
Date Analyzed: Date Prepared:												
1.54	mg/L	SM4500-P-F	0.0212	0.0500	1.000	0.67	86.7	90 - 110				1
Date Analyzed: Date Prepared:												
4.32	mg/L	SM4500-P-F	0.0212	0.0500	1.000	3.8	52.3	90 - 110				1
Date Analyzed: Date Prepared:												
1.46	mg/L	SM4500-P-F	0.0212	0.0500	1.000	0.545	92.0	90 - 110				
Date Analyzed: Date Prepared:												
12.9	mg/L	SM4500-P-F	0.212	0.500	1.000	11.5	138	90 - 110				2
	Date Analyzed:  189  Date Analyzed:  238  Date Analyzed:  122  Date Analyzed: Date Prepared:  1.54  Date Analyzed: Date Prepared:  4.32  Date Analyzed: Date Prepared:  1.46  Date Analyzed: Date Prepared:	Date Analyzed: 10/29/201  189 mg/L  Date Analyzed: 10/29/201  238 mg/L  Date Analyzed: 11/06/201  122 mg/L  Date Analyzed: 11/02/201  1.54 mg/L  Date Prepared: 11/02/201  4.32 mg/L  Date Analyzed: 11/02/201  4.32 mg/L  Date Prepared: 11/02/201  1.46 mg/L  Date Analyzed: 11/02/201  1.46 mg/L  Date Prepared: 11/02/201  Date Prepared: 11/02/201  1.46 mg/L	Date Analyzed:       10/29/2015 824h         189       mg/L       SM2320B         Date Analyzed:       10/29/2015 824h         238       mg/L       SM2320B         Date Analyzed:       11/06/2015 2057h         122       mg/L       E353.2         Date Analyzed:       11/02/2015 1705h         Date Prepared:       11/02/2015 1400h         1.54       mg/L       SM4500-P-F         Date Analyzed:       11/02/2015 1400h         4.32       mg/L       SM4500-P-F         Date Analyzed:       11/02/2015 1400h         1.46       mg/L       SM4500-P-F         Date Analyzed:       11/02/2015 1746h         Date Prepared:       11/02/2015 1746h         Date Prepared:       11/02/2015 1740h         Date Prepared:       11/02/2015 1746h         Date Prepared:       11/02/2015 1740h	Date Analyzed:       10/29/2015 824h         189       mg/L       SM2320B       1.86         Date Analyzed:       11/06/2015 2057h         122       mg/L       E353.2       0.833         Date Analyzed:       11/02/2015 1705h         Date Prepared:       11/02/2015 1400h         1.54       mg/L       SM4500-P-F       0.0212         Date Analyzed:       11/02/2015 1724h         Date Prepared:       11/02/2015 1400h         1.46       mg/L       SM4500-P-F       0.0212         Date Analyzed:       11/02/2015 1400h         1.46       mg/L       SM4500-P-F       0.0212         Date Analyzed:       11/02/2015 1746h         Date Prepared:       11/02/2015 1746h         Date Prepared:       11/02/2015 1400h         1.46       mg/L       SM4500-P-F       0.0212         Date Analyzed:       11/02/	Result         Units         Method         MDL         Limit           Date Analyzed:         10/29/2015 824h         1.86         10.0           Date Analyzed:         10/29/2015 824h         1.86         10.0           Date Analyzed:         11/06/2015 2057h         1.86         10.0           Date Analyzed:         11/06/2015 2057h         1.86         10.0           Date Analyzed:         11/02/2015 1705h         1.00         1.00           Date Prepared:         11/02/2015 1400h         1.54         mg/L         SM4500-P-F         0.0212         0.0500           Date Analyzed:         11/02/2015 1400h         1.32         mg/L         SM4500-P-F         0.0212         0.0500           Date Analyzed:         11/02/2015 1400h         1.46         mg/L         SM4500-P-F         0.0212         0.0500           Date Analyzed:         11/02/2015 1400h         1.46         mg/L         SM4500-P-F         0.0212         0.0500           Date Analyzed:         11/02/2015 1400h         1.46         mg/L         SM4500-P-F         0.0212         0.0500	Result         Units         Method         MDL         Limit         Spiked           Date Analyzed:         10/29/2015 824h         1.86         10.0         100.0           Date Analyzed:         10/29/2015 824h         10.0         100.0           238         mg/L         SM2320B         1.86         10.0         100.0           Date Analyzed:         11/06/2015 2057h         122         mg/L         E353.2         0.833         1.00         100.0           Date Analyzed:         11/02/2015 1705h         11/02/2015 1400h         1.54         mg/L         SM4500-P-F         0.0212         0.0500         1.000           Date Analyzed:         11/02/2015 1718h         11/02/2015 1400h         1.000         1.000           Date Analyzed:         11/02/2015 1400h         0.0500         1.000           Date Prepared:         11/02/2015 1400h         0.0500         1.000           Date Analyzed:         11/02/2015 1400h         0.0500         1.000           Date Analyzed:         11/02/2015 1400h         0.0500         1.000	Result         Units         Method         MDL         Limit         Spiked         Amount           Date Analyzed:         10/29/2015 824h         189         mg/L         SM2320B         1.86         10.0         100.0         87.9           Date Analyzed:         10/29/2015 824h	Result         Units         Method         MDL         Limit         Spiked         Amount         %REC           Date Analyzed:         10/29/2015 824h         1.86         10.0         100.0         87.9         101           Date Analyzed:         10/29/2015 824h                238         mg/L         SM2320B         1.86         10.0         100.0         137         101           Date Analyzed:         11/06/2015 2057h                 122         mg/L         E353.2         0.833         1.00         100.0         18.6         103           Date Analyzed:         11/02/2015 1705h                Date Prepared:         11/02/2015 1400h	Result         Units         Method         MDL         Limit         Spiked         Amount         %REC         Limits           Date Analyzed:         10/29/2015 824h         10/29/2015 824h         10.0         100.0         87.9         101         80 - 120           Date Analyzed:         10/29/2015 824h         10/29/2015 824h         10/20/2015 100.0         100.0         137         101         80 - 120           Date Analyzed:         11/06/2015 2057h         122         mg/L         E353.2         0.833         1.00         100.0         18.6         103         90 - 110           Date Analyzed:         11/02/2015 1705h         10/2015 1400h         1.54         mg/L         SM4500-P-F         0.0212         0.0500         1.000         0.67         86.7         90 - 110           Date Analyzed:         11/02/2015 1400h         1.000         3.8         52.3         90 - 110           Date Analyzed:         11/02/2015 14400h         1.000         3.8         52.3         90 - 110           Date Analyzed:         11/02/2015 14400h         1.000         3.8         52.3         90 - 110           Date Analyzed:         11/02/2015 1440h         0.0500         1.000         0.545         92.0         90 - 110	Result         Units         Method         MDL         Limit         Spiked         Amount         %REC         Limits         Amt           Date Analyzed:         10/29/2015 824h         189         mg/L         SM2320B         1.86         10.0         100.0         87.9         101         80 - 120         102           Date Analyzed:         10/29/2015 824h         10/29/2015 824h         10/2015 100.0         137         101         80 - 120         10/2015 100.0         100.0         137         101         80 - 120         10/2015 100.0         10/2015 100.0         100.0         18.6         103         90 - 110         10/2015 100.0	Result   Units   Method   MDL   Limit   Spiked   Amount   %REC   Limits   Amt   %RPD	Name

 $<sup>^{\</sup>it I}$  - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

### 3440 South 700 West

Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

**Lab Set ID:** 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

**Contact:** Jim Harris

**Dept:** WC **QC Type:** MSD

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>1510561-018AMSD</b> 300.0-W	Date Analyzed:	10/29/20	15 2128h										
Chloride		495	mg/L	E300.0	0.751	10.0	500.0	15.8	95.9	90 - 110	499	0.765	20	
Sulfate		696	mg/L	E300.0	2.11	75.0	500.0	207	97.7	90 - 110	697	0.280	20	
Lab Sample ID: Test Code:	<b>1510563-006AMSD</b> 300.0-W	Date Analyzed:	10/29/20	15 2219h										
Chloride		496	mg/L	E300.0	0.751	10.0	500.0	14.7	96.4	90 - 110	496	0.00316	20	
Sulfate		629	mg/L	E300.0	2.11	75.0	500.0	141	97.6	90 - 110	630	0.265	20	
Lab Sample ID: Test Code:	<b>1510566-012AMSD</b> 300.0-W	Date Analyzed:	10/30/20	15 050h										
Chloride		497	mg/L	E300.0	0.751	10.0	500.0	15.7	96.3	90 - 110	498	0.164	20	
Sulfate		689	mg/L	E300.0	2.11	75.0	500.0	202	97.4	90 - 110	689	0.0439	20	
Lab Sample ID: Test Code:	<b>1510567-012AMSD</b> 300.0-W	Date Analyzed:	10/30/20	15 141h										
Chloride		497	mg/L	E300.0	0.751	10.0	500.0	17.6	95.8	90 - 110	502	1.08	20	
Sulfate		692	mg/L	E300.0	2.11	75.0	500.0	205	97.5	90 - 110	696	0.590	20	
Lab Sample ID: Test Code:	<b>1510561-018AMSD</b> ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as Ca	CO3)	196	mg/L	SM2320B	1.86	10.0	100.0	94.6	101	80 - 120	193	1.70	10	
Lab Sample ID: Test Code:	<b>1510563-006AMSD</b> ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as Ca	CO3)	213	mg/L	SM2320B	1.86	10.0	100.0	110	103	80 - 120	208	2.38	10	
Lab Sample ID: Test Code:	<b>1510566-012AMSD</b> ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as Ca	200	257	mg/L	SM2320B	1.86	10.0	100.0	156	101	80 - 120	260	1.31	10	

### 3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686, Toll Free: (888) 263-8686, Fax: (801) 263-8687

e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

### **QC SUMMARY REPORT**

**Client:** Utah Division of Water Quality

Lab Set ID: 1510566

**Project:** Gold King Mine Spill / 01255.1.016.03

Contact: Jim Harris

**Dept:** WC **QC Type:** MSD

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:1510567-012AMSDTest Code:ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as CaCO3)	186	mg/L	SM2320B	1.86	10.0	100.0	87.9	98.0	80 - 120	189	1.81	10	
Lab Sample ID:1510580-001CMSDTest Code:ALK-W-2320B	Date Analyzed:	10/29/20	15 824h										
Alkalinity (as CaCO3)	237	mg/L	SM2320B	1.86	10.0	100.0	137	99.7	80 - 120	238	0.716	10	
Lab Sample ID:         1510563-021AMSD           Test Code:         NO2/NO3-W-353.2	Date Analyzed:	11/06/20	15 2058h										
Nitrate/Nitrite (as N)	121	mg/L	E353.2	0.833	1.00	100.0	18.6	103	90 - 110	122	0.493	10	
Lab Sample ID:         1510561-018AMSD           Test Code:         PO4-W-4500PF	Date Analyzed: Date Prepared:		1/02/2015 1706h 1/02/2015 1400h										
Phosphate, Total (as P)	1.60	mg/L	SM4500-P-F	0.0212	0.0500	1.000	0.67	92.8	90 - 110	1.54	3.89	10	
Lab Sample ID:         1510566-012AMSD           Test Code:         PO4-W-4500PF	Date Analyzed: Date Prepared:		11/02/2015 1719h 11/02/2015 1400h										
Phosphate, Total (as P)	3.20	mg/L	SM4500-P-F	0.0212	0.0500	1.000	3.8	-60.1	90 - 110	4.33	29.9	10	1@
Lab Sample ID:         1510567-012AMSD           Test Code:         PO4-W-4500PF	Date Analyzed: Date Prepared:		11/02/2015 1724h 11/02/2015 1400h										
Phosphate, Total (as P)	1.52	mg/L	SM4500-P-F	0.0212	0.0500	1.000	0.545	97.3	90 - 110	1.47	3.55	10	
Lab Sample ID:         1510563-021AMSD           Test Code:         PO4-W-4500PF	Date Analyzed: Date Prepared:		11/02/2015 1746h 11/02/2015 1400h										
Phosphate, Total (as P)	11.6	mg/L	SM4500-P-F	0.212	0.500	1.000	11.5	14.0	90 - 110	12.9	10.1	10	2
@ High PPD due to suspected sample non	h												

<sup>@ -</sup> High RPD due to suspected sample non-homogeneity or matrix interference.

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.