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INORGANIC DATA QUALITY REVIEW REPORT
METALS BY ICPMS, ICP, CVAA, WET CHEMISTRY AND SPECIAL METHODS

SDG	L95270, L95302, L95442
PROJECT	GCC Rio Grande – Second Quarter 2025, Resource Hydrogeologic Services and GCC, Pueblo CO
LABORATORY	ACZ Laboratories, Steamboat Springs, CO
SAMPLE MATRIX	Water SAMPLING DATE:
ANALYSES REQUESTED	EPA 200.7 (metals by ICP, dissolved), EPA 200.8 (metals by ICPMS, dissolved), EPA 245.1 (mercury, dissolved), SM4500F-C (Fluoride), M353.2 (nitrate + nitrite as nitrogen, nitrite as nitrogen, nitrate as nitrogen); SM2540C (total dissolved solids); D516-02/-07/-11 -Sulfate by turbidimetry; SM4500Cl-E (Chloride), SM 2320 B-2011 (Alkalinity)
SAMPLE NUMBER	MW-13, MW-14, MW-21, MW-22, MW-23, MW-2B, MW-10, MW-11, MW-12, MW-18, MW-19, MW-20, MW-3B, MW-6, MW-7, MW-8, MW-9

DATA REVIEWER: John Huntington

QA REVIEWER: Diane Short & Associates, Inc. INITIALS/DATE: ___DLS___8/11/2025

Telephone Logs included Yes____ No __X_
Contractual Violations Yes____ No __X_

The Contract Laboratory Program National Functional Guidelines for Inorganic Data Review 2016 (NFG) and the requested EPA Methods, Methods of Chemical Analysis of Water and Wastes (MCAWW) and Standard Methods (SM, current updates) have been referenced by the reviewer to perform this data validation review. The review includes evaluation of calibration, holding times and Quality Control (QC) for all samples; and 10% review of transcription and calculation algorithms from the raw data. Determining the exact analytical sequence was performed to verify that the frequencies of QC sample analyses were met, where applicable, on 10% of the data. General comments regarding the data/analytical quality are part of the review when raw data are submitted. The reports use Diane Short & Associates (DSA) validation qualifiers in the text and tables that include the compilation of the reasons for qualification and the associated values, as defined in each section for QC outliers. The United States Environmental Protection Agency (EPA) qualifiers have been provided. The DSA qualifiers, EPA qualifiers, and validation codes are included in the Electronic Data Deliverable (EDD). Note: those items in this report which have an asterisk (*) are specific to inductively coupled plasma-mass spectrometry (ICP-MS) and may include inductively coupled plasma-atomic emission spectroscopy (ICP-AES) as applicable.

I. DELIVERABLES

All deliverables were present as specified in the Statement of Work (SOW), SW-846, or in the project contract. This includes the Case Narrative.

Yes __X__ No _____

Data were submitted for EPA 200.7 (16 metals by ICP, dissolved), EPA 200.8 (4 metals by ICPMS, dissolved), EPA 245.1 (mercury, dissolved), SM4500F-C (Fluoride), M353.2 (nitrate + nitrite as nitrogen, nitrite as nitrogen, nitrate as nitrogen); SM2540C (total dissolved solids); D516-02/-07/-11 -Sulfate by turbidimetry; SM4500Cl-E (Chloride), SM 2320 B-2011 (Alkalinity). Note that for these SDGs, pH was not requested.

The data were validated at EPA Level III (EPA Stage 2B) with a minimum of 10% validated as EPA raw data review).

The laboratory has reported detections to the MDL and has flagged results between the MDL and the PQL with a "B". This is noted because many laboratories use "J" instead of "B" for this purpose, so the meaning of this flag needs to be kept in mind when reviewing the data. The definition of lab flags is provided in the report in the Inorganic Reference section.

II. ANALYTICAL REPORT FORMS

A. The Analytical Report or Data Sheets are present and complete for all requested analyses.

Yes __X__ No _____

B. Holding Times

1. The contract holding times were met for all analyses (time of sample receipt to date of analysis).

Yes __X__ No _____ N/A _____

Data are qualified from date of collection to analysis, as presented in the next section.

2. The method holding times were met for all analyses (time of sample collection to date of analysis per the holding times in the project QAPP).

Yes __X__ No _____

The method holding times were met for all analyses.
No qualifiers added due to holding times.

3. Samples were properly preserved to pH < 2 for metals, and applicable preservative was used for other methods.

Yes _____ No __X__ N/A _____

Preservation: SDG L95270 was received at 19.4 degrees C, which is 13.4 degrees above the EPA acceptance limit. SDG L95302 was received at 9.9 degrees C, which is 3.9 degrees above the EPA acceptance limit. For metals, chloride, and fluoride, there are no regulatory temperature specifications, and no qualifiers are required for those methods due to the elevated receipt temperature. However, for the other methods 40CFR Part 165 Table II specifies that sampled be maintained at a temperature below 6 degrees C. For this reason, impacted samples are qualified as JT#, where # is the difference between the received temperature and 6 degrees.

From a technical perspective it is not likely that these temperature deviations would have a major impact on results, since samples were received no more than one day from sampling. There could be slight low bias for most of the methods or possible false non-detects at the MDL with a lower probability at the RL. For nitrite/nitrate, there could be a slight low bias to nitrite and slight high bias to nitrate. All units in the table are mg/L.

CLIENTID	LABID	ANALYTE	RESULT	Lab Flag	MDL	PQL	DSA	EPA
MW-14	L95270-01	Bicarbonate as CaCO3	1320		2	20	JT13.4	J-
MW-13	L95270-02	Bicarbonate as CaCO3	1130		2	20	JT13.4	J-
MW-21	L95302-01	Bicarbonate as CaCO3	760		2	20	JT3.9	J-
MW-22	L95302-02	Bicarbonate as CaCO3	819		2	20	JT3.9	J-
MW-23	L95302-03	Bicarbonate as CaCO3	877		2	20	JT3.9	J-
MW-2B	L95302-04	Bicarbonate as CaCO3	907		2	20	JT3.9	J-
MW-14	L95270-01	Carbonate as CaCO3	94.3		2	20	JT13.4	J-
MW-13	L95270-02	Carbonate as CaCO3	106		2	20	JT13.4	J-
MW-21	L95302-01	Carbonate as CaCO3	85.7		2	20	JT3.9	J-
MW-22	L95302-02	Carbonate as CaCO3	76.1		2	20	JT3.9	J-
MW-23	L95302-03	Carbonate as CaCO3	91.3		2	20	JT3.9	J-
MW-2B	L95302-04	Carbonate as CaCO3	49.6		2	20	JT3.9	J-
MW-14	L95270-01	Hydroxide as CaCO3		U	2	20	JT13.4	J-
MW-13	L95270-02	Hydroxide as CaCO3		U	2	20	JT13.4	J-
MW-21	L95302-01	Hydroxide as CaCO3		U	2	20	JT3.9	J-
MW-22	L95302-02	Hydroxide as CaCO3		U	2	20	JT3.9	J-
MW-23	L95302-03	Hydroxide as CaCO3		U	2	20	JT3.9	J-
MW-2B	L95302-04	Hydroxide as CaCO3		U	2	20	JT3.9	J-
MW-14	L95270-01	Nitrate/Nitrite as N	0.033	B	0.02	0.1	JT13.4	J-
MW-13	L95270-02	Nitrate/Nitrite as N		U	0.02	0.1	JT13.4	J-
MW-21	L95302-01	Nitrate/Nitrite as N		U	0.02	0.1	JT3.9	J-
MW-22	L95302-02	Nitrate/Nitrite as N	23.4		0.3	1.5	JT3.9	J-
MW-23	L95302-03	Nitrate/Nitrite as N	2.9		0.02	0.1	JT3.9	J-
MW-2B	L95302-04	Nitrate/Nitrite as N	3.38		0.02	0.1	JT3.9	J-
MW-14	L95270-01	Nitrite as N		U	0.01	0.05	JT13.4	J-
MW-13	L95270-02	Nitrite as N	0.023	B	0.01	0.05	JT13.4	J-
MW-21	L95302-01	Nitrite as N		U	0.01	0.05	JT3.9	J-
MW-22	L95302-02	Nitrite as N	0.664		0.01	0.05	JT3.9	J-
MW-23	L95302-03	Nitrite as N	0.048	B	0.01	0.05	JT3.9	J-
MW-2B	L95302-04	Nitrite as N	0.059		0.01	0.05	JT3.9	J-
MW-14	L95270-01	Residue, Filterable (TDS) @180C	4410		40	80	JT13.4	J-
MW-13	L95270-02	Residue, Filterable (TDS) @180C	2650		40	80	JT13.4	J-
MW-21	L95302-01	Residue, Filterable (TDS) @180C	2510		20	40	JT3.9	J-
MW-22	L95302-02	Residue, Filterable (TDS) @180C	3230		20	40	JT3.9	J-
MW-23	L95302-03	Residue, Filterable (TDS)	1740		20	40	JT3.9	J-

		@180C						
MW-2B	L95302-04	Residue, Filterable (TDS) @180C	1760		40	80	JT3.9	J-
MW-14	L95270-01	Sulfate	184		5	25	JT13.4	J-
MW-13	L95270-02	Sulfate	292		25	125	JT13.4	J-
MW-21	L95302-01	Sulfate	1090		50	250	JT3.9	J-
MW-22	L95302-02	Sulfate	394		25	125	JT3.9	J-
MW-23	L95302-03	Sulfate	355		25	125	JT3.9	J-
MW-2B	L95302-04	Sulfate	366		25	125	JT3.9	J-
MW-14	L95270-01	Total Alkalinity	1410		2	20	JT13.4	J-
MW-13	L95270-02	Total Alkalinity	1240		2	20	JT13.4	J-
MW-21	L95302-01	Total Alkalinity	846		2	20	JT3.9	J-
MW-22	L95302-02	Total Alkalinity	895		2	20	JT3.9	J-
MW-23	L95302-03	Total Alkalinity	969		2	20	JT3.9	J-

C. Chains of Custody (COC)

Chains of Custody (COC) were reviewed and all fields were complete, signatures were present, and cross outs were clean and initialed.

Yes __X__ No _____

All sample analyses were sent under a COC to ACZ Labs, Steamboat Springs, CO.

III. CALIBRATION AND STANDARDIZATION

1. Initial calibration, mass calibration, and resolution checks for both low and high mass isotopes were within 0.1 atomic mass unit (amu) of the true value. (*)

Yes __X__ No _____

All requisite instrument tuning or performance measures were done according to the method requirements. (*).

US EPA Tune Check Sample reports were provided in the raw data and reports indicated the tunes passed in all cases.

2. Mass calibration and resolution checks for both low and high mass isotopes produced a peak width of approximately 0.6 to 0.9 amu at 10% peak height. (*)

Yes __X__ No _____

3. Instrument Stability

A tuning solution was analyzed a minimum of four times, and the relative standard deviation (RSD) of absolute signals for all analytes was less than 5%. (*)

Yes __X__ No _____

B. Instrument Performance and Calibration Standards

1. The Initial Calibration Verification (ICV) standard was within the required control limits of ± 10% of the established value for all analytes. (80 – 120% for mercury, 85 – 115% for Se species)

Yes __X__ No _____

2. The Continuing Calibration Verification (CCV) standards were analyzed at the required frequency following every 10 analyses.

Yes __X__ No _____
Sequencing was performed to verify that the frequencies were met for client samples and for proper application of the qualifiers.

3. The CCV standard percent recovery results were within the required control limits of 90 – 110% (80 – 120 % for mercury, 75 – 125% for Se species)

Yes __X__ No _____
All CCVs were within criteria.

4. The correlation coefficients met the ≥ 0.995 criterion, as applicable to the method for mercury.

Yes __X__ No _____

IV. CONTRACT REQUIRED DETECTION LIMIT (CRDL) STANDARDS

1. The 2x CRDL standards were analyzed for metals as required in the QAPP.

Yes __X__ No _____ N/A _____
A CRDL check is not required for Method 200.8. However, the laboratory initial calibration run each day has a low-level standard that is very near the reporting limit. This meets method requirements. The 200.7 method does include an RL Check standard that meets criteria.

2. The 2x CRDL standards were within the required control limits of 70 – 130% (ICP: 50 – 150% for Lead, Antimony, and Thallium; ICPMS: 50 – 150% for Cobalt, Manganese, and Zinc).

Yes __X__ No _____
All CRDLs were within criteria.

V. INTERFERENCES

Isobaric Elemental and Molecular Interferences (* for ICP-MS)
The isotope selected was free of isobaric elemental and elemental interferences as measured by the Interference Check Sample Solutions A and AB (ICSA/ICSAB) for ICP-AES and ICP-MS.

Yes __X__ No _____
Data are only qualified if the interfering analyte is present in the sample and at levels near the high end of the linear range of the instrument. For Method 200.7, the recovery of the spectral interference check standard (SIC) is reported in the QC as a recovery for each element analyzed. All are in control. Method 200.8 does not specify the use of interference check standards. The laboratory has used collision deactivation and accepted reagent gas technology to minimize interference for ICP/MS.

VI. LABORATORY REAGENT BLANK (LRB) OR PREPARATION BLANK

A. Blanks were prepared and analyzed at the required frequency of at least one per each set of samples.

Yes __X__ No _____

The ICB is used as the method blank for metals. This is acceptable since no digestion was performed on the samples prior to analysis.

B. All analytes in the blank were less than the MDL.

Yes _____ No __X__

Analytes reported as contaminants in the Preparation Blank are qualified with the DSA qualifier "UMB#," where # is the value of the associated blank. Only detected data less than 10x the blank for metals or 5x the blank for other analyses are qualified. Such data are fully usable as non-detected values at the reported concentration or elevated reporting limit. The alkalinity method blank has low detections in all SDGS. In SDG L95442, the MW-3B sample (a field blank) has a detection very similar to the associated method blank levels and is qualified as UMB13, indicating that it should be regarded as a non-detect. In all other samples, the alkalinity results are greater than 5 times the laboratory preparation blank and no qualifiers are required.

CLIENTID	LABID	ANALYTE	RESULT (mg/L)	Lab flag	MDL	PQL	DSA	EPA
MW-3B	L95442-11	Total Alkalinity	11.9	B	2	20	UMB13	UB

No other analytes require qualification for preparation blank contamination. Note that that in metals analysis, a formal preparation blank is only used for mercury. The other metals are direct injection of sample and preparation is not performed. ICBs and CCBs serve the same function. This is acceptable per method.

C. The source of contamination was corrected, and the samples were reanalyzed.

Yes _____ No _____ N/A __X__

VII. CALIBRATION BLANKS

The highest blank associated with any particular analyte is used for the qualification process and is the value entered after the DSA "B" blank-qualifier descriptor.

A. Calibration Blanks were prepared and analyzed at the required frequency after each set of 10 samples as required by the method.

Yes __X__ No _____

Sequencing was required to verify association with client samples.

B. The Calibration Blank results were within the required control limits or did not require data qualification.

Yes _____ No __X__ N/A _____

Analytes reported as contaminants in the Calibration Blanks are qualified with the DSA qualifier "UCB#," where # is the value of the blank. Such data are fully usable as non-detected values at the reported concentration or elevated reporting limit. Only detected data less than 10 × blank for metals and 5 × blank for other analyse are qualified.

For metals analysis, ICBs and/or CCBs have some detections. Qualifiers required are in the table below and in the qualified EDDs.

CLIENTID	LABID	ANALYTE	RESULT (mg/L)	Lab flag	MDL	PQL	DSA	EPA
MW-3B	L95442-11	Total Alkalinity	11.9	B	2	20	UMB13	UB

CLIENTID	LABID	ANALYTE	RESULT (mg/L)	Lab flag	MDL	PQL	DSA	EPA
MW-14	L95270-01	Copper, dissolved	0.051	B	0.05	0.25	UCB0.011	UB
MW-20	L95442-01	Cobalt, dissolved	0.000349		0.00005	0.00025	UCB0.000065	UB
MW-19	L95442-02	Cobalt, dissolved	0.000262		0.00005	0.00025	UCB0.000065	UB
MW-12	L95442-03	Cobalt, dissolved	0.000483		0.00005	0.00025	UCB0.000065	UB
MW-11	L95442-04	Cobalt, dissolved	0.000470		0.00005	0.00025	UCB0.000065	UB
MW-8	L95442-07	Cobalt, dissolved	0.000490		0.00005	0.00025	UCB0.000065	UB
MW-3B	L95442-11	Calcium, dissolved	0.22	B	0.1	0.5	UCB0.15	UB

C. Field, decon rinse or other Field Blanks are contained and identified in the package.

Yes __X__ No _____ N/A _____

The MW-3B field sample is a field blank. The results for the field blank are used to evaluate associated samples (those taken on the same day) after qualification of the field blank for associated method blank contamination.

D. The reported results for the Field Blanks are less than the CRDL or less than the MDL, whichever is lower.

Yes __X__ No _____ N/A _____

There are several detections in the field blank. Cobalt and boron required qualifiers for some samples due to field blank contamination as shown in the table below.

CLIENTID	LABID	ANALYTE	RESULT (mg/L)	Lab Flag	MDL	PQL	DSA	EPA
MW-10	L95442-08	Cobalt, dissolved	0.000299		0.00005	0.00025	UFB0.0002	UB
MW-9	L95442-09	Cobalt, dissolved	0.00163		0.00005	0.00025	UFB0.0002	UB
MW-18	L95442-10	Cobalt, dissolved	0.000557		0.00005	0.00025	UFB0.0002	UB
MW-20	L95442-01	Boron, dissolved	0.835		0.06	0.2	UFB0.097	UB
MW-19	L95442-02	Boron, dissolved	0.489	B	0.15	0.5	UFB0.097	UB
MW-12	L95442-03	Boron, dissolved	0.912		0.06	0.2	UFB0.097	UB
MW-11	L95442-04	Boron, dissolved	0.479		0.06	0.2	UFB0.097	UB
MW-6	L95442-05	Boron, dissolved	0.375	B	0.15	0.5	UFB0.097	UB
MW-7	L95442-06	Boron, dissolved	0.345	B	0.15	0.5	UFB0.097	UB
MW-8	L95442-07	Boron, dissolved	0.880		0.06	0.2	UFB0.097	UB
MW-18	L95442-10	Boron, dissolved	0.763		0.03	0.1	UFB0.097	UB

VIII. INTERNAL STANDARD RESPONSES (*)

A. A minimum of three internal standards were present in all standards and blanks at identical levels.

Yes __X__ No _____

B. The absolute response of each internal standard (IS) was within the required EPA control limits of 60 – 125%.

Yes __X__ No _____
For the analytes reported.

C. Dilutions were performed as required by the method to minimize errors if the internal standard analyte is naturally present in a sample.

Yes _____ No _____ N/A __X__

D. If not, the appropriate test procedures were performed, and the required corrections made.

Yes _____ No _____ N/A __X__

IX. MATRIX SPIKES

A. Matrix Spike and Matrix Spike Duplicate (MS/MSD) samples were prepared and analyzed at one per every 20 or fewer samples for each matrix and each sampling event per day as required.

Yes __X__ No _____
Matrix spikes, duplicates, and matrix spike duplicates were present (note that for most metals on this project these are post-spikes since analysis is by direct injection with no separate preparation step). For wet chemistry, a matrix spike and a matrix duplicate are analyzed. The project manager will determine if the project frequency is met for these methods. Matrix spikes associated with this set of data are shown in the table below. It is recommended that the client collect Representative samples for each method and designate them to the laboratory to be used for the MS/MSDs. As these samples are collected quarterly, only 1 QC sample per method would be required per year.

Spiked Sample - L95270	**Methods**
MW-13	EPA 245.1 (mercury)
Spiked Sample - L95302	
MW-2B	EPA 200.7
MW-23	EPA 200.8
MW-21	SM 4500-Cl E-2011, SM 4500-F C-2011
Spiked Sample - L95442	
MW-18	EPA 200.7
MW-6	EPA 200.8
MW-3B (invalid, 3B is field blank)	SM 4500-Cl E-2011
MW-19	EPA 245.1 (mercury)
MW-11	EPA 353.2

B. The MS/MSD percent recoveries were within the required control limits of 75 – 125%.

Yes _____ No __X__ N/A _____

When matrix spikes are present, associated data are qualified with the DSA qualifier JMS#, where # is the value of the %R for the associated MS or MSD. Data may be biased high or low proportional to the spike recovery. The laboratory 'flags' data as M1 whether they are > 4x spike or within the qualifying limits. The laboratory flags are not recommended for use in evaluating the data as MS/MSD recoveries are not used for qualification of data if the result in the parent sample is > 4x the spike. Non-detected data are not qualified for high spikes. Only those MS/MSDs with parent samples in these projects are considered.

For some methods, such as Method 300.0 and Method 353.2, the laboratory uses a recovery window of 90-110%. Results are only qualified if the recoveries are outside the window specified above.

Selenium recovered high in the MS/MSD of sample MW-6 in SDG L95442. The sample is reported as a non-detect for selenium and no qualifier is required.

C. A Post Digestion Spike was prepared and analyzed if required.

Yes _____ No _____ N/A __X__

Not required in this case.

D. The MS/MSD samples were client samples.

Yes __X__ No _____

MS/MSD analyses were also performed on client samples from other SDGs but are not pertinent for qualification. A chloride spike was run on MW-3B, which is a field blank. This spike is not evaluated.

X. MATRIX DUPLICATE

A. Matrix Duplicate samples were prepared and analyzed per every 20 samples for each matrix.

Yes __X__ No _____

Lab duplicates are present for Nitrate, nitrite, chloride, alkalinity, TDS, and sulfate. Some of these are associated with other SDGs and are not evaluated here. Matrix duplicates and MS/MSD RPDS are in control.

Parent Sample SDG **L95270**	Methods
None	
Parent Sample SDG **L95302**	
MW-2B	SM 2320 B-2011
Parent Sample SDG **L95442**	
MW-10	SM 2320 B-2011
MW-6	EPA 353.2
MW-12	SM 2540 C-2011

B. The MS/MSD or MD relative percent difference (RPD) values were within the required control limit of ≤ 20 RPD for water samples or ≤ 35% RPD for soil samples. If either of the MD results is less than 5x RL, the RPD is not used. In that case the difference between the results is evaluated and the QC limit is the difference between the original and the duplicate results (± 1x RL for water samples or ± 2x RL for soil samples). If the parent sample result is greater than 4 x the spike concentration, the MS/MSD is not evaluated. Only detected results are qualified for MS/MSD RPD outliers. Only those MS/MSDs with parent samples in these projects are considered.

Yes __X__ No _____
Data are qualified with the DSA qualifier JD#, where # is the value of the RPD for the associated MD or MS/MSD analyses, when there are outliers. In this case there are no qualifiers.

XI. LABORATORY CONTROL SAMPLE

A. Laboratory Control Samples (LCS) were prepared and analyzed per every 20 samples for each matrix.

Yes __X__ No _____

B. The LCS recoveries were within the required control limits of 80 – 120% for metals and for wet chemistry analyses 85 – 115% .

Yes __X__ No _____
All LCS analyses were within criteria.

XII. FIELD QC

A. Field QC samples were identified.

Yes __X__ No _____
Sample MW-2B is a blind duplicate of sample MW-23.

B. Field duplicates were within the guidance limit of < 30% RPD for water samples or < 50% RPD for soil samples. If values are less than 5x RL, the water limit is ± 1x RL or the soil limit is ± 2x RL.

Yes __X__ No _____ N/A _____

XIII. SERIAL DILUTION

A. Serial Dilutions were analyzed for every 20 samples if the analyte concentrations were greater than 50x IDL.

Yes _____ No _____ N/A __X__
Analyte concentrations are too low to require serial dilutions.

B. The percent difference (% D) criteria of ± 10% were met.

Yes _____ No _____ N/A __X__
When outliers are present, data are qualified with the DSA qualifier JE#, where # is the %D. Data could be biased, usually high, due to non-linear matrix or chemical effects.

XIV. CALCULATIONS

A. Data calculations were checked when required, and significant figures were correctly reported.

Yes __X__ No _____
Over 25% of the data were checked from the raw data to the EDD values for each method and each SDG.

B. Appropriate dilution factors were applied to the calculated sample concentrations.

Yes __X__ No _____

C. Data were acceptable for the total versus dissolved and the cation/ anion balance.
Yes _X__ No ___NA_____

Total metals were not requested, so the total vs dissolved check cannot be performed. The cation-anion balance and calculated TDS are performed and are in control. These parameters are not evaluated for the field blank, since the levels of cations, anions, and TDS are too low to give meaningful comparisons.

XV. OVERALL ASSESSMENT OF THE CASE

The laboratory has complied with the requested methods and the data is considered fully useable for project purposes with consideration of the following qualifications or comments.

Data were submitted for EPA 200.7 (16 metals by ICP, dissolved), EPA 200.8 (4 metals by ICPMS, dissolved), EPA 245.1 (mercury, dissolved), SM4500F-C (Fluoride), M353.2 (nitrate + nitrite as nitrogen, nitrite as nitrogen, nitrate as nitrogen); SM2540C (total dissolved solids); D516-02/-07/-11 -Sulfate by turbidimetry; SM4500Cl-E (Chloride), SM 2320 B-2011 (Alkalinity). Note that for these SDGs, pH was not requested.

The data were validated at EPA Level III (EPA Stage 2B) with a minimum of 10% validated as EPA raw data review).

The laboratory has reported detections to the MDL and has flagged results between the MDL and the PQL with a "B". This is noted because many laboratories use "J" instead of "B" for this purpose, so the meaning of this flag needs to be kept in mind when reviewing the data. The definition of lab flags is provided in the report in the Inorganic Reference section.

Chain of Custody and Sample Preservation

All sample analyses were sent under a COC to ACZ Labs, Steamboat Springs, CO.

Preservation: SDG L95270 was received at 19.4 degrees C, which is 13.4 degrees above the EPA acceptance limit. SDG L95302 was received at 9.9 degrees C, which is 3.9 degrees above the EPA acceptance limit. For metals, chloride, and fluoride, there are no regulatory temperature specifications, and no qualifiers are required for those methods due to the elevated receipt temperature. However, for the other methods 40CFR Part 165 Table II specifies that sampled be maintained at a temperature below 6 degrees C. For this reason, impacted samples are qualified as JT#, where # is the difference between the received temperature and 6 degrees.

From a technical perspective it is not likely that these temperature deviations would have a major impact on results, since samples were received no more than one day from sampling. There could be slight low bias for most of the methods or possible false non-detects at the MDL with a lower probability at the RL. For nitrite/nitrate, there could be a slight low bias to nitrite and slight high bias to nitrate.

Holding Times

The method holding times were met for all analyses. No qualifiers added due to holding times.

Method Blanks

Analytes reported as contaminants in the Preparation Blank are qualified with the DSA qualifier "UMB#," where # is the value of the associated blank. Only detected data less than 10x the blank for metals or 5x the blank for other analyses are qualified. Such data are fully usable as non-detected values at the reported concentration or elevated reporting limit. The alkalinity method blank has low detections in all SDGS. In SDG L95442, the MW-3B sample (a field blank) has a detection very similar to the associated method blank levels and is qualified as UMB13, indicating that it should be regarded as a non-detect. In all other samples, the alkalinity results are greater than 5 times the laboratory preparation blank and no qualifiers are required.

No other analytes require qualification for preparation blank contamination. Note that that in metals analysis, a formal preparation blank is only used for mercury. The other metals are direct injection of sample and

preparation is not performed. ICBs and CCBs serve the same function. This is acceptable per method.

Initial and Continuing Calibration Blanks
Analytes reported as contaminants in the Calibration Blanks are qualified with the DSA qualifier "UCB#," where # is the value of the blank. Such data are fully usable as non-detected values at the reported concentration or elevated reporting limit. Only detected data less than 10 × blank for metals and 5 × blank for other analyse are qualified.

For metals analysis, ICBs and/or CCBs have some detections. Qualifiers required are in the table within the CCB section of this report and in the qualified EDDs.

Field Blanks
There are several detections in the field blank. Cobalt and boron required qualifiers for some samples due to field blank contamination as shown in the table in the field blank section of this report.

Matrix Spikes, Matrix Spike Duplicates, and Matrix Duplicates
Matrix spikes, duplicates, and matrix spike duplicates were present (note that for most metals on this project these are post-spikes since analysis is by direct injection with no separate preparation step). For wet chemistry, a matrix spike and a matrix duplicate are analyzed. The project manager will determine if the project frequency is met for these methods. Matrix spikes associated with this set of data are shown in the table below. It is recommended that the client collect Representative samples for each method and designate them to the laboratory to be used for the MS/MSDs. As these samples are collected quarterly, only 1 QC sample per method would be required per year.

Spiked Sample - L95270	**Methods**
MW-13	EPA 245.1 (mercury)
Spiked Sample - L95302	
MW-2B	EPA 200.7
MW-23	EPA 200.8
MW-21	SM 4500-Cl E-2011, SM 4500-F C-2011
Spiked Sample - L95442	
MW-18	EPA 200.7
MW-6	EPA 200.8
MW-3B (invalid, 3B is field blank)	SM 4500-Cl E-2011
MW-19	EPA 245.1 (mercury)
MW-11	EPA 353.2

Selenium recovered high in the MS/MSD of sample MW-6 in SDG L95442. The sample is reported as a non-detect for selenium and no qualifier is required.
MS/MSD analyses were also performed on client samples from other SDGs but are not pertinent for qualification. A chloride spike was run on MW-3B, which is a field blank. This spike is not evaluated.

Lab duplicates are present for Nitrate, nitrite, chloride, alkalinity, TDS, and sulfate. Some of these are associated with other SDGs and are not evaluated here. Matrix duplicates and MS/MSD RPDS are in control.

Parent Sample SDG **L95270**	Methods

None	
Parent Sample SDG **L95302**	
MW-2B	SM 2320 B-2011
Parent Sample SDG **L95442**	
MW-10	SM 2320 B-2011
MW-6	EPA 353.2
MW-12	SM 2540 C-2011

Field QC

Sample MW-2B is a blind duplicate of sample MW-23. All field duplicate criteria are met.

Cation-Anion Balance and Calculated TDS

Total metals were not requested, so the total vs dissolved check cannot be performed. The cation-anion balance and calculated TDS are performed and are in control. These parameters are not evaluated for the field blank, since the levels of cations, anions, and TDS are too low to give meaningful comparisons.

TABLE OF QUALIFIED DATA

CLIENTID	LABID	ANALYTE	RESULT	Lab Flag	UNITS	MDL	PQL	DSA	EPA
MW-14	L95270-01	Bicarbonate as CaCO3	1320		mg/L	2	20	JT13.4	J-
MW-13	L95270-02	Bicarbonate as CaCO3	1130		mg/L	2	20	JT13.4	J-
MW-21	L95302-01	Bicarbonate as CaCO3	760		mg/L	2	20	JT3.9	J-
MW-22	L95302-02	Bicarbonate as CaCO3	819		mg/L	2	20	JT3.9	J-
MW-23	L95302-03	Bicarbonate as CaCO3	877		mg/L	2	20	JT3.9	J-
MW-2B	L95302-04	Bicarbonate as CaCO3	907		mg/L	2	20	JT3.9	J-
MW-20	L95442-01	Boron, dissolved	0.835		mg/L	0.06	0.2	UFB0.097	UB
MW-19	L95442-02	Boron, dissolved	0.489	B	mg/L	0.15	0.5	UFB0.097	UB
MW-12	L95442-03	Boron, dissolved	0.912		mg/L	0.06	0.2	UFB0.097	UB
MW-11	L95442-04	Boron, dissolved	0.479		mg/L	0.06	0.2	UFB0.097	UB
MW-6	L95442-05	Boron, dissolved	0.375	B	mg/L	0.15	0.5	UFB0.097	UB
MW-7	L95442-06	Boron, dissolved	0.345	B	mg/L	0.15	0.5	UFB0.097	UB
MW-8	L95442-07	Boron, dissolved	0.880		mg/L	0.06	0.2	UFB0.097	UB
MW-18	L95442-10	Boron, dissolved	0.763		mg/L	0.03	0.1	UFB0.097	UB
MW-3B	L95442-11	Calcium, dissolved	0.22	B	mg/L	0.1	0.5	UCB0.15	UB
MW-14	L95270-01	Carbonate as CaCO3	94.3		mg/L	2	20	JT13.4	J-
MW-13	L95270-02	Carbonate as CaCO3	106		mg/L	2	20	JT13.4	J-
MW-21	L95302-01	Carbonate as CaCO3	85.7		mg/L	2	20	JT3.9	J-
MW-22	L95302-02	Carbonate as CaCO3	76.1		mg/L	2	20	JT3.9	J-
MW-23	L95302-03	Carbonate as CaCO3	91.3		mg/L	2	20	JT3.9	J-
MW-2B	L95302-04	Carbonate as CaCO3	49.6		mg/L	2	20	JT3.9	J-
MW-20	L95442-01	Cobalt, dissolved	0.000349		mg/L	0.00005	0.00025	UCB0.000065	UB
MW-19	L95442-02	Cobalt, dissolved	0.000262		mg/L	0.00005	0.00025	UCB0.000065	UB
MW-12	L95442-03	Cobalt, dissolved	0.000483		mg/L	0.00005	0.00025	UCB0.000065	UB
MW-11	L95442-04	Cobalt, dissolved	0.000470		mg/L	0.00005	0.00025	UCB0.000065	UB
MW-8	L95442-07	Cobalt, dissolved	0.000490		mg/L	0.00005	0.00025	UCB0.000065	UB
MW-10	L95442-08	Cobalt, dissolved	0.000299		mg/L	0.00005	0.00025	UFB0.0002	UB
MW-9	L95442-09	Cobalt, dissolved	0.00163		mg/L	0.00005	0.00025	UFB0.0002	UB
MW-18	L95442-10	Cobalt, dissolved	0.000557		mg/L	0.00005	0.00025	UFB0.0002	UB
MW-14	L95270-01	Copper, dissolved	0.051	B	mg/L	0.05	0.25	UCB0.011	UB
MW-14	L95270-01	Hydroxide as CaCO3		U	mg/L	2	20	UJT13.4	J-
MW-13	L95270-02	Hydroxide as CaCO3		U	mg/L	2	20	UJT13.4	J-

CLIENTID	LABID	ANALYTE	RESULT	Lab Flag	UNITS	MDL	PQL	DSA	EPA
MW-21	L95302-01	Hydroxide as CaCO3		U	mg/L	2	20	UJT3.9	J-
MW-22	L95302-02	Hydroxide as CaCO3		U	mg/L	2	20	UJT3.9	J-
MW-23	L95302-03	Hydroxide as CaCO3		U	mg/L	2	20	UJT3.9	J-
MW-2B	L95302-04	Hydroxide as CaCO3		U	mg/L	2	20	UJT3.9	J-
MW-14	L95270-01	Nitrate/Nitrite as N	0.033	B	mg/L	0.02	0.1	JT13.4	J-
MW-13	L95270-02	Nitrate/Nitrite as N		U	mg/L	0.02	0.1	UJT13.4	J-
MW-21	L95302-01	Nitrate/Nitrite as N		U	mg/L	0.02	0.1	UJT3.9	J-
MW-22	L95302-02	Nitrate/Nitrite as N	23.4		mg/L	0.3	1.5	JT3.9	J-
MW-23	L95302-03	Nitrate/Nitrite as N	2.90		mg/L	0.02	0.1	JT3.9	J-
MW-2B	L95302-04	Nitrate/Nitrite as N	3.38		mg/L	0.02	0.1	JT3.9	J-
MW-14	L95270-01	Nitrite as N		U	mg/L	0.01	0.05	UJT13.4	J-
MW-13	L95270-02	Nitrite as N	0.023	B	mg/L	0.01	0.05	JT13.4	J-
MW-21	L95302-01	Nitrite as N		U	mg/L	0.01	0.05	UJT3.9	J-
MW-22	L95302-02	Nitrite as N	0.664		mg/L	0.01	0.05	JT3.9	J-
MW-23	L95302-03	Nitrite as N	0.048	B	mg/L	0.01	0.05	JT3.9	J-
MW-2B	L95302-04	Nitrite as N	0.059		mg/L	0.01	0.05	JT3.9	J-
MW-14	L95270-01	Residue, Filterable (TDS) @180C	4410		mg/L	40	80	JT13.4	J-
MW-13	L95270-02	Residue, Filterable (TDS) @180C	2650		mg/L	40	80	JT13.4	J-
MW-21	L95302-01	Residue, Filterable (TDS) @180C	2510		mg/L	20	40	JT3.9	J-
MW-22	L95302-02	Residue, Filterable (TDS) @180C	3230		mg/L	20	40	JT3.9	J-
MW-23	L95302-03	Residue, Filterable (TDS) @180C	1740		mg/L	20	40	JT3.9	J-
MW-2B	L95302-04	Residue, Filterable (TDS) @180C	1760		mg/L	40	80	JT3.9	J-
MW-14	L95270-01	Sulfate	184		mg/L	5	25	JT13.4	J-
MW-13	L95270-02	Sulfate	292		mg/L	25	125	JT13.4	J-
MW-21	L95302-01	Sulfate	1090		mg/L	50	250	JT3.9	J-
MW-22	L95302-02	Sulfate	394		mg/L	25	125	JT3.9	J-
MW-23	L95302-03	Sulfate	355		mg/L	25	125	JT3.9	J-
MW-2B	L95302-04	Sulfate	366		mg/L	25	125	JT3.9	J-
MW-14	L95270-01	Total Alkalinity	1410		mg/L	2	20	JT13.4	J-
MW-13	L95270-02	Total Alkalinity	1240		mg/L	2	20	JT13.4	J-
MW-21	L95302-01	Total Alkalinity	846		mg/L	2	20	JT3.9	J-
MW-22	L95302-02	Total Alkalinity	895		mg/L	2	20	JT3.9	J-
MW-23	L95302-03	Total Alkalinity	969		mg/L	2	20	JT3.9	J-
MW-2B	L95302-04	Total Alkalinity	956		mg/L	2	20	JT3.9	J-
MW-3B	L95442-11	Total Alkalinity	11.9	B	mg/L	2	20	UMB13	UB