ENVIRONMENTAL® STANDARDS
Montrose Environmental Group

Stage 2 Data Validation Memorandum
Chevron Bishop Loss of Containment Response Site
Galeton, Colorado
Solid Samples
Sample Delivery Group: L1853260
Report Date: June 3, 2025

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of one solid sample collected on April 29, 2025, at the Chevron Bishop Loss of Containment Response Site in Galeton, Colorado. This sample was analyzed by Pace Analytical National Center for Testing and Innovation (Pace National) of Mount Juliet, Tennessee, for radionuclides by US EPA Method 901.1.

This review was performed in accordance with the Bishop Loss of Containment, Galeton, Colorado Environmental Sampling and Analysis Plan (CTEH; Version 1.4, May 7, 2025), the Bishop Loss of Containment Incident Draft Quality Assurance Project Plan (QAPP; Environmental Standards, Inc. [Environmental Standards]; Version 1.0, April 25, 2025) and the above-referenced analytical method. This review was performed with guidance from the National Functional Guidelines for Inorganic Superfund Methods Data Review (US EPA, 2020). This validation guidance document specifically addresses analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and is not completely applicable to the type of analyses and analytical protocols performed for the US EPA method utilized by the laboratory for this sample. Environmental Standards used professional judgment to determine the quality of the analytical results and compliance relative to the US EPA method utilized by the laboratory.

Summary

The analytical results and associated laboratory quality control (QC) samples were reviewed to determine the integrity of the reported analytical results and to ensure that the data met the established measurement quality objectives. This QA review includes all samples in Pace National Sample Delivery Group (SDG) L1853260.

The sample that has undergone Stage 2 data validation is listed below:

Sample Identification	Laboratory Sample Identification	Laboratory SDG	Matrix	Date Sample Collected	Parameters Examined
GACO0429T055S001	L1853260-01	L1853260	Solid	4/29/25	Ra-226, Ac-228, Bi-214, Pb-214, Th-234

Parameters Examined:

Ra-226 - Radium-226 by US EPA Method 901.1.
Ac-228 - Actinium-228 by US EPA Method 901.1.
Bi-214 - Bismuth-214 by US EPA Method 901.1.
Pb-214 - Lead-214 by US EPA Method 901.1.
Th-234 - Thorium-234 by US EPA Method 901.1.

ITEMS REVIEWED

Chain of Custody (COC) Record and Case Narrative	Sample Condition Upon Laboratory Receipt
Holding Times	Blank Results
Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Results	Data Package Completeness

Based on the items included in this QA review, qualification of the data was not warranted.

Review performed by: Brittny A. Aguiar, Quality Assurance Chemist
Report reviewed by: Konstadina Vlahogiani, Senior Associate Chemist
Report approved by: Amanda J. Cover, CEAC, Associate Chemist/Project Manager
Date review completed: 6/3/2025

SECTION 2

ANALYTICAL RESULTS

DATA QUALIFIERS

U The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

NJ The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.

REASON CODES AND EXPLANATIONS

Reason Code[1]	Description
[1] For any Reason Code that does not indicate that the potential bias is indeterminate, the "+" or "-" reason code may be appended to the qualification reason code in order to indicate a direction of bias (e.g., MS+ would be used to indicate potential high bias due to a high matrix spike recovery)	
+	The associated quality control item indicates a potential high bias in the sample result
-	The associated quality control item indicates a potential low bias in the sample result
AST	Compound not quantitated against an authentic standard; potential bias indeterminate
BF	Contamination present in a field blank (e.g., Field Blank, Equipment Blank, etc.); evaluation criteria exceeded
BL	Contamination present in a laboratory blank (e.g., Method Blank, Instrument Blank, etc.); evaluation criteria exceeded
BN	Elevated detection limit or estimated result due to negative instrument drift (e.g., negative instrument blank result with an absolute value > 2× the method detection limit)
BT	Contamination present in the Trip Blank; evaluation criteria exceeded
CC	Possible contamination due to carryover from a previous sample
CR	Calculated result in which one or more of the components has been qualified
CRQ	Calculated result flagged due to reporting protocol
CT	Cooler temperature criteria not met
CV	Continuing calibration verification evaluation criteria not met
CY	Chemical Yield recovery criteria not met
DI	Detector instability (radionuclide chemistry); potential bias indeterminate
EC	Result exceeds the calibration range; potential bias indeterminate
FD	Field duplicate imprecision; potential bias indeterminate
FP	Target compound identification criteria not met; potential false positive
GH	Headspace present in the gamma spectrometer sample analysis vessel; potential bias indeterminate
GS	Low sample density in the gamma spectrometer sample analysis vessel; potential bias indeterminate
HT	Holding time exceeded
HV	Headspace present in volatile vials
IC	Initial calibration evaluation criteria not met

Reason Code[1]	Description
IN	Interference (e.g., laboratory, chemical, chromatographic/instrumental, and/or matrix) present in the analysis
IR	Interference check standard evaluation criteria not met
IS	Internal standard evaluation criteria not met
LC	Laboratory control sample/laboratory control sample duplicate recovery criteria not met
LCP	Laboratory control sample/laboratory control sample duplicate precision criteria not met; potential bias indeterminate
LD	Laboratory duplicate precision criteria not met; potential bias indeterminate
LR	Linear range exceeded; potential bias indeterminate
MDP	Laboratory deviated from the method for a method-defined parameter, based on regulatory requirements
MS	Matrix spike/matrix spike duplicate recovery criteria not met
MSP	Matrix spike/matrix spike duplicate precision criteria not met; potential bias indeterminate
NQC	Absence of supporting quality control samples
PD	Post-digestion spike recovery criteria not met
OT	Other deficiencies, see validation report for additional details
PM	Performance evaluation mixture criteria not met
PS	Low percent solids; potential bias indeterminate
PT	Chromatographic pattern in sample does not match pattern of calibration standard
QCI	Quantitation/confirmation ion ratios in sample are inconsistent with reference spectra; potential bias indeterminate
RA	Replicate/multiple analyses criteria not met; potential bias indeterminate
RM	Reference material recovery criteria not met
RL	The analysis meets all qualitative identification criteria, but the measured concentration is between the method detection limit and the quantitation or reporting limit; potential bias indeterminate
RS	Reporting limit standard(s) outside of acceptance limits
SA	Method of standard additions criteria not met; potential bias indeterminate
SC	Relative percent difference between two columns exceeds criteria; potential bias indeterminate
SCC	Second column confirmation was not performed as required by the analysis method
SCT	Sample counting time error (radionuclide chemistry); potential bias indeterminate

Reason Code[1]	Description
SD	Serial dilution results did not meet evaluation criteria
SP	Sample preservation criteria not met
SR	Surrogate recovery criteria not met
SS	Second source calibration verification/initial calibration verification criteria not met
ST	Sample container type incorrect
SU	Sample result is less than the two-sigma uncertainty
SUN	Absolute value of the negative sample result is greater than the two-sigma uncertainty
SW	Sample switch suspected
TD	Result for dissolved constituent significantly exceeded result for total constituent; potential bias indeterminate
TIR	Tentatively identified compound; observed in an associated laboratory, equipment, field, or trip blank.
TN	Instrument tune criteria not met
Y	Potential bias due to the y-intercept in the calibration curve significantly affecting the analyte response

Facility: A07-01 Pad
SDG: L1853260

Lab Sample ID	L1853260-01
Sys Sample Code	GACO0429T055S001
Sample Name	GACO0429T055S001
Sample Date	4/29/2025 11:30:00 AM
Sample Type	N
Matrix	SO
Parent Sample	
% Moisture	

Analytic Method	Chemical Name	CAS Rn	Fraction	Test Type	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
E901.1	Actinium-228 (Ra-228)	14331-83-0	N	INITIAL	pCi/g	1.03			0.218	0.324	0.324	0.324	Y	Y	1	NA
	Bismuth-214 (Ra-226)	14733-03-0	N	INITIAL	pCi/g	0.587			0.139	0.202	0.202	0.202	Y	Y	1	NA
	Lead-214	15067-28-4	N	INITIAL	pCi/g	0.620			0.135	0.211	0.211	0.211	Y	Y	1	NA
	Radium-226 (186 KeV)	13982-63-3	N	INITIAL	pCi/g	0.227	U		0.789	1.45	1.45	1.45	N	Y	1	NA
	Thorium-234 (U-238)	15065-10-8	N	INITIAL	pCi/g	0.187	U		1.31	3.03	3.03	3.03	N	Y	1	NA