

This review was performed with guidance from the National Functional Guidelines for Inorganic Superfund Methods Data Review (US EPA, 2020, US EPA). This validation guidance document specifically addresses analyses performed in accordance with the CLP analytical methods and is not completely applicable to the type of analyses and analytical protocols performed for the Standard Method (SM), SW-846, ASTM, and/or US EPA methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the quality of the analytical results and compliance relative to the Standard Method (SM), SW-846, ASTM, and/or US EPA utilized by the laboratory. This QA review was performed on the data associated with Sample Delivery Group (SDG):

**L1858935**

The findings offered in this report are based on a review of the Chain-of-Custody Record and Case Narrative, sample preservation and condition upon laboratory receipt, holding times, chemical yield, field and laboratory blank results, laboratory and field duplicate precision, laboratory control sample / laboratory control sample duplicate recoveries and precision, matrix spike / matrix spike duplicate recoveries and precision, and/or percent solids (as applicable). All review items may not have been included in this SDG; therefore, only those items included in this SDG were addressed in the QA review.

A summary of the results of the data review process is provided below:

Based on this QA review, data qualification was not warranted.

<b>Data Qualifiers</b>	
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.
<b>Reason Codes and Explanations</b>	
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
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
CY	Chemical Yield recovery criteria not met
EC	Result exceeds the calibration range; potential bias indeterminate
FD	Field duplicate imprecision; potential bias indeterminate
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
IN	Interference (e.g ., laboratory, chemical, chromatographic/instrumental, and/or matrix) present in the analysis
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
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
PD	Post-digestion spike recovery criteria not met
OT	Other deficiencies, see validation report for additional details
PS	Low percent solids; potential bias indeterminate
RA	Replicate/multiple analyses criteria not met; potential bias indeterminate
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
SC	Relative percent difference between two columns exceeds criteria; potential bias indeterminate
SP	Sample preservation criteria not met
SR	Surrogate recovery 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
TIC	Tentatively identified compound, quantified using an assumed calibration factor; potential bias indeterminate

Lab Sample ID	L1858935-01
Sys Sample Code	GACO0514T016S001
Sample Name	GACO0514T016S001
Sample Date	5/14/2025 10:35:00 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	0.695	U		0.345	0.802	0.802	0.802	N	Y	1	NA
	Bismuth-214 (Ra-226)	14733-03-0	N	INITIAL	pCi/g	0.671			0.221	0.315	0.315	0.315	Y	Y	1	NA
	Lead-214	15067-28-4	N	INITIAL	pCi/g	0.800			0.215	0.383	0.383	0.383	Y	Y	1	NA
	Radium-226 (186 KeV)	13982-63-3	N	INITIAL	pCi/g	0.615	U		1.05	1.99	1.99	1.99	N	Y	1	NA
	Thorium-234 (U-238)	15065-10-8	N	INITIAL	pCi/g	1.00	U		1.60	3.55	3.55	3.55	N	Y	1	NA

<b>Lab Sample ID</b>	L1858935-02
<b>Sys Sample Code</b>	GACO0514T016C001
<b>Sample Name</b>	GACO0514T016C001
<b>Sample Date</b>	5/14/2025 10:35:00 AM
<b>Sample Type</b>	FD
<b>Matrix</b>	SO
<b>Parent Sample</b>	GACO0514T016S001
<b>% Moisture</b>	

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	1.04			0.319	0.535	0.535	0.535	Y	Y	1	NA
	Bismuth-214 (Ra-226)	14733-03-0	N	INITIAL	pCi/g	0.823			0.223	0.298	0.298	0.298	Y	Y	1	NA
	Lead-214	15067-28-4	N	INITIAL	pCi/g	0.715			0.195	0.306	0.306	0.306	Y	Y	1	NA
	Radium-226 (186 KeV)	13982-63-3	N	INITIAL	pCi/g	1.18	U		0.987	1.73	1.73	1.73	N	Y	1	NA
	Thorium-234 (U-238)	15065-10-8	N	INITIAL	pCi/g	0.949	U		1.09	2.48	2.48	2.48	N	Y	1	NA

<b>Lab Sample ID</b>	L1858935-03
<b>Sys Sample Code</b>	GACO0514T016S002
<b>Sample Name</b>	GACO0514T016S002
<b>Sample Date</b>	5/14/2025 11:00:00 AM
<b>Sample Type</b>	N
<b>Matrix</b>	SO
<b>Parent Sample</b>	
<b>% Moisture</b>	

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	0.935			0.208	0.309	0.309	0.309	Y	Y	1	NA
	Bismuth-214 (Ra-226)	14733-03-0	N	INITIAL	pCi/g	0.520			0.139	0.201	0.201	0.201	Y	Y	1	NA
	Lead-214	15067-28-4	N	INITIAL	pCi/g	0.955			0.164	0.176	0.176	0.176	Y	Y	1	NA
	Radium-226 (186 KeV)	13982-63-3	N	INITIAL	pCi/g	1.46			0.706	1.14	1.14	1.14	Y	Y	1	NA
	Thorium-234 (U-238)	15065-10-8	N	INITIAL	pCi/g	1.22	U		1.05	2.06	2.06	2.06	N	Y	1	NA