



Donny Juarez  
Energy Laboratories  
2393 Salt Creek Hwy  
Casper, WY 82601  
USA

**SOIL-119**  **Final Report**

**Soil/Hazardous Waste Proficiency Testing**

**Soil Study**

**Open Date: 07/25/2022**

**Close Date: 09/08/2022**

**Report Issued Date: 09/12/2022**



A Waters Company

September 12, 2022

Donny Juarez  
Energy Laboratories  
2393 Salt Creek Hwy  
Casper, WY 82601

Enclosed is your final report for ERA's SOIL-119 Proficiency Testing (PT) study. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SOIL-119 Proficiency Testing study have been evaluated using the following tiered approach. If the analyte is listed in the most current TNI Fields of Proficiency Testing (FoPT) table the evaluation was completed by comparing the reported result to the acceptance limits generated using the criteria contained in the table and the evaluation criteria contained in the 2016 TNI Standard, Volume 3. If the analyte is not included in the TNI FoPT table, the reported result has been evaluated using the procedures outlined in ERA's Standard Operating Procedure for the Generation of Performance Acceptance Limits (SOP 730002268).

Corrective Action Help: As part of your accreditation(s), you may be required to identify the root cause of any "Not Acceptable" results, implement the necessary corrective actions, and then satisfy your PT requirements by participating in a Supplemental (Quik™ Response) or future ERA PT study. ERA's technical staff is available to help your laboratory resolve any technical issues that may be impairing your PT performance and possibly affecting your routine data quality. Our laboratory and technical staff have many years of collective experience in performing the full range of environmental analyses. As part of our technical support, ERA offers QC samples that can be useful in helping you work through your technical issues.

Thank you for your participation in ERA's SOIL-119 Proficiency Testing study. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

A handwritten signature in black ink, appearing to read "Craig Huff", with a horizontal line extending to the right.

Craig Huff  
Senior Technical Manager

attachments





A Waters Company

Report Recipient	Contact/Phone Number	Reporting Type
Florida	Vanessa Soto / 904-791-1599	All Analytes

# SOIL-119 Definitions & Study Discussion

**Study Dates: 07/25/2022 - 09/08/2022**

**Report Issued: 09/12/2022**

## SOIL Study Definitions

The Reported Value is the value that the laboratory reported to ERA.

The ERA Assigned Values are compliant with the most current TNI Fields of Proficiency Testing (FoPT) table. The Assigned Values for the Organic Proficiency Testing Standards are equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation as applicable. The assigned values for the Inorganic Proficiency Testing Standards, with the exception of the TCLP Metals in Soil and Total Organic Carbon (TOC) in the Nutrients in Soil sample, are equal to the maximum amount of the parameter available in the standard by applicable EPA methodologies. The assigned values for the TCLP metals and TOC are equal to the mean of the study data, after the removal of outliers. All parameters not added to the standard are given an Assigned Value of "< PTRL", per the guidelines contained in the 2016 TNI Standard. The assigned values are directly traceable to the commercially prepared starting materials used to manufacture the PT standards.

The Acceptance Limits are established per the criteria contained in the most current TNI FoPT table or ERA's SOP for the Generation of Performance Acceptance Limits™ as applicable.

The Performance Evaluation:

Acceptable = Reported Value falls within the Acceptance Limits.

Not Acceptable = Reported Value falls outside the Acceptance Limits.

No Evaluation = Reported Value cannot be evaluated.

Not Reported = No Value reported.

The Method Description is the method the laboratory reported to ERA.

## SOIL Study Discussion

ERA's SOIL-119 Proficiency Testing (PT) study has been reviewed by ERA senior management and certified compliant with the requirements of the 2016 TNI Standard and the criteria contained in the most current TNI Fields of Proficiency Testing (FoPT) table.

ERA's SOIL-119 study standards were examined for any anomalies. A full review of all homogeneity, stability and accuracy verification data was completed. All analytical verification data for all analytes in the standards met the acceptance criteria contained in the 2016 TNI Standard and the criteria contained in the most current TNI FoPT table.

The data submitted by participating laboratories was also examined for study anomalies. There were no anomalies observed during the statistical review of the data.

ERA's SOIL-119 Proficiency Testing study reports shall not be reproduced except in its entirety and not without the permission of the participating laboratory. The report must not be used by the participating laboratories to claim product endorsement any agency of the U. S. government.

The data contained herein are confidential and intended for your use only.

If you have any questions or concerns regarding your assessment in ERA's SOIL Proficiency Testing program, please contact our Proficiency Testing Department at 1-800-372-0122.



# SOIL-119 Laboratory Exception Report



A Waters Company

**Donny Juarez**  
**Quality Assurance Manager**  
**Energy Laboratories**  
**2393 Salt Creek Hwy**  
**Casper, WY 82601**  
**307-235-0515 x3244**

<b>EPA ID:</b>	<b>WY00002</b>
<b>ERA Customer Number:</b>	<b>E772828</b>
<b>Report Issued:</b>	<b>09/12/2022</b>
<b>Study Dates:</b>	<b>07/25/2022 - 09/08/2022</b>

## Not Acceptable Evaluations

There were no Not Acceptable evaluations for this study.



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.

16341 Table Mountain Pkwy • Golden, CO 80403 • 800.372.0122 • 303.431.8454 • fax 303.421.0159 • [www.eraqc.com](http://www.eraqc.com)



Study # : SOIL-119



# Final Report Results For Laboratory Energy Laboratories

All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.

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Study # : SOIL-119





# Final Evaluation Report

## Study: **SOIL-119**

ERA Customer Number: **E772828**

Laboratory Name: **Energy Laboratories**

## Inorganic Results



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.

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# SOIL-119 Final Evaluation Report

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TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
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**SOIL Metals in Soil (cat# 620, lot# D119-540)**

1000	Aluminum	mg/kg	7499	10100	4010 - 12100	Acceptable	EPA 6010B 2 1996	8/11/2022	-0.317	8040	1690	jcg
1005	Antimony	mg/kg	57.6	232	23.2 - 323	Acceptable	EPA 6010B 2 1996	8/11/2022	-0.916	129	77.8	jcg
1010	Arsenic	mg/kg	186	195	128 - 238	Acceptable	EPA 6010B 2 1996	8/11/2022	0.191	183	15.5	jcg
1015	Barium	mg/kg	323	321	223 - 372	Acceptable	EPA 6010B 2 1996	8/9/2022	1.06	297	24.0	jcg
1020	Beryllium	mg/kg	79.3	84.8	59.1 - 98.4	Acceptable	EPA 6010B 2 1996	8/11/2022	0.0829	78.8	6.62	jcg
1025	Boron	mg/kg	112	126	57.2 - 139	Acceptable	EPA 6010B 2 1996	8/11/2022	1.30	95.3	12.8	jcg
1030	Cadmium	mg/kg	236	247	166 - 276	Acceptable	EPA 6010B 2 1996	8/9/2022	0.725	221	20.9	jcg
1035	Calcium	mg/kg	5128	5190	3410 - 6000	Acceptable	EPA 6010B 2 1996	8/9/2022	1.03	4710	410	jcg
1040	Chromium	mg/kg	196	217	140 - 260	Acceptable	EPA 6010B 2 1996	8/11/2022	-0.231	200	17.4	jcg
1050	Cobalt	mg/kg	96.5	105	73.0 - 122	Acceptable	EPA 6010B 2 1996	8/11/2022	-0.103	97.4	8.59	jcg
1055	Copper	mg/kg	145	145	102 - 170	Acceptable	EPA 6010B 2 1996	8/9/2022	0.870	136	10.4	jcg
1070	Iron	mg/kg	14580	15000	4890 - 23200	Acceptable	EPA 6010B 2 1996	8/11/2022	0.179	14000	3050	jcg
1075	Lead	mg/kg	288	270	190 - 324	Acceptable	EPA 6010B 2 1996	8/9/2022	1.31	257	23.8	jcg
1080	Lithium	mg/kg		6.80	2.58 - 11.3	Not Reported				6.96	1.46	
1085	Magnesium	mg/kg	2351	2570	1420 - 3170	Acceptable	EPA 6010B 2 1996	8/11/2022	0.224	2290	266	jcg
1090	Manganese	mg/kg	411	401	289 - 473	Acceptable	EPA 6010B 2 1996	8/9/2022	0.963	381	31.5	jcg
1095	Mercury	mg/kg		18.2	10.9 - 25.5	Not Reported				18.2	2.08	
1100	Molybdenum	mg/kg	169	203	128 - 230	Acceptable	EPA 6010B 2 1996	8/11/2022	-0.573	179	17.2	jcg
1105	Nickel	mg/kg	189	187	118 - 219	Acceptable	EPA 6010B 2 1996	9/2/2022	1.28	169	16.0	jcg
1125	Potassium	mg/kg	2035	2420	1200 - 2860	Acceptable	EPA 6010B 2 1996	8/9/2022	0.0207	2030	323	jcg



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.







# SOIL-119 Final Evaluation Report

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**SOIL Metals in Soil (cat# 620, lot# D119-540) (Continued)**

1140	Selenium	mg/kg	259	241	150 - 285	Acceptable	EPA 6010B 2 1996	8/11/2022	2.17	217	19.1	jcg
1150	Silver	mg/kg	75.4	72.0	47.9 - 87.6	Acceptable	EPA 6010B 2 1996	9/2/2022	1.01	67.8	7.52	jcg
1155	Sodium	mg/kg	449	468	249 - 606	Acceptable	EPA 6010B 2 1996	8/11/2022	0.501	427	43.2	jcg
1160	Strontium	mg/kg	124	122	83.7 - 148	Acceptable	EPA 6010B 2 1996	8/9/2022	0.894	116	9.03	jcg
1165	Thallium	mg/kg		88.9	52.4 - 109	Not Reported				80.5	8.28	
1175	Tin	mg/kg	157	161	83.7 - 198	Acceptable	EPA 6010B 2 1996	8/11/2022	1.14	141	14.2	jcg
1180	Titanium	mg/kg	365	486	54.7 - 638	Acceptable	EPA 6010B 2 1996	8/11/2022	0.192	346	97.2	jcg
1184	Uranium	mg/kg		137	98.5 - 167	Not Reported				133	11.5	
1185	Vanadium	mg/kg	211	225	153 - 257	Acceptable	EPA 6010B 2 1996	8/11/2022	0.344	205	18.0	jcg
1190	Zinc	mg/kg	251	242	157 - 292	Acceptable	EPA 6010B 2 1996	8/9/2022	1.24	224	21.5	jcg



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





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**SOIL Metals in Soil (cat# 620, lot# D119-540)**

1000	Aluminum	mg/kg	7474	10100	4010 - 12100	Acceptable	EPA 6020A 1 2007	9/2/2022	-0.332	8040	1690	jcg
1005	Antimony	mg/kg	66.8	232	23.2 - 323	Acceptable	EPA 6020A 1 2007	8/6/2022	-0.797	129	77.8	jcg
1010	Arsenic	mg/kg	207	195	128 - 238	Acceptable	EPA 6020A 1 2007	8/6/2022	1.54	183	15.5	jcg
1015	Barium	mg/kg	302	321	223 - 372	Acceptable	EPA 6020A 1 2007	8/15/2022	0.189	297	24.0	jcg
1020	Beryllium	mg/kg	76.7	84.8	59.1 - 98.4	Acceptable	EPA 6020A 1 2007	8/15/2022	-0.310	78.8	6.62	jcg
1025	Boron	mg/kg	107	126	57.2 - 139	Acceptable	EPA 6020A 1 2007	9/7/2022	0.912	95.3	12.8	jcg
1030	Cadmium	mg/kg	267	247	166 - 276	Acceptable	EPA 6020A 1 2007	9/2/2022	2.21	221	20.9	jcg
1035	Calcium	mg/kg	4986	5190	3410 - 6000	Acceptable	EPA 6020A 1 2007	9/2/2022	0.681	4710	410	jcg
1040	Chromium	mg/kg	221	217	140 - 260	Acceptable	EPA 6020A 1 2007	8/6/2022	1.21	200	17.4	jcg
1050	Cobalt	mg/kg	96.9	105	73.0 - 122	Acceptable	EPA 6020A 1 2007	8/6/2022	-0.0563	97.4	8.59	jcg
1055	Copper	mg/kg	156	145	102 - 170	Acceptable	EPA 6020A 1 2007	9/7/2022	1.93	136	10.4	jcg
1070	Iron	mg/kg	15030	15000	4890 - 23200	Acceptable	EPA 6020A 1 2007	8/15/2022	0.327	14000	3050	jcg
1075	Lead	mg/kg	261	270	190 - 324	Acceptable	EPA 6020A 1 2007	8/9/2022	0.173	257	23.8	jcg
1080	Lithium	mg/kg		6.80	2.58 - 11.3	Not Reported				6.96	1.46	
1085	Magnesium	mg/kg	2330	2570	1420 - 3170	Acceptable	EPA 6020A 1 2007	8/9/2022	0.145	2290	266	jcg
1090	Manganese	mg/kg	392	401	289 - 473	Acceptable	EPA 6020A 1 2007	8/9/2022	0.360	381	31.5	jcg
1095	Mercury	mg/kg		18.2	10.9 - 25.5	Not Reported				18.2	2.08	
1100	Molybdenum	mg/kg	169	203	128 - 230	Acceptable	EPA 6020A 1 2007	8/15/2022	-0.573	179	17.2	jcg
1105	Nickel	mg/kg	204	187	118 - 219	Acceptable	EPA 6020A 1 2007	9/2/2022	2.22	169	16.0	jcg
1125	Potassium	mg/kg	1793	2420	1200 - 2860	Acceptable	EPA 6020A 1 2007	8/6/2022	-0.728	2030	323	jcg



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





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**SOIL Metals in Soil (cat# 620, lot# D119-540) (Continued)**

1140	Selenium	mg/kg	260	241	150 - 285	Acceptable	EPA 6020A 1 2007	9/2/2022	2.22	217	19.1	jcg
1150	Silver	mg/kg	80.4	72.0	47.9 - 87.6	Acceptable	EPA 6020A 1 2007	9/2/2022	1.68	67.8	7.52	jcg
1155	Sodium	mg/kg	473	468	249 - 606	Acceptable	EPA 6020A 1 2007	8/9/2022	1.06	427	43.2	jcg
1160	Strontium	mg/kg	115	122	83.7 - 148	Acceptable	EPA 6020A 1 2007	8/6/2022	-0.102	116	9.03	jcg
1165	Thallium	mg/kg	71.2	88.9	52.4 - 109	Acceptable	EPA 6020A 1 2007	8/6/2022	-1.12	80.5	8.28	jcg
1175	Tin	mg/kg	147	161	83.7 - 198	Acceptable	EPA 6020A 1 2007	8/15/2022	0.438	141	14.2	jcg
1180	Titanium	mg/kg	337	486	54.7 - 638	Acceptable	EPA 6020A 1 2007	8/15/2022	-0.0960	346	97.2	jcg
1184	Uranium	mg/kg	146	137	98.5 - 167	Acceptable	EPA 6020A 1 2007	9/2/2022	1.15	133	11.5	jcg
1185	Vanadium	mg/kg	214	225	153 - 257	Acceptable	EPA 6020A 1 2007	8/6/2022	0.510	205	18.0	jcg
1190	Zinc	mg/kg	269	242	157 - 292	Acceptable	EPA 6020A 1 2007	9/2/2022	2.08	224	21.5	jcg

**SOIL Nutrients in Soil (cat# 869, lot# D119-542)**

1515	Ammonia as N	mg/kg		674	319 - 892	Not Reported				606	58.9	
1795	Total Kjeldahl Nitrogen	mg/kg		1190	621 - 1690	Not Reported				1160	126	
2040	Total Organic Carbon (TOC)	mg/kg		3820	1270 - 6370	Not Reported				3820	851	
1910	Total Phosphorus	mg/kg	1543	1410	359 - 2300	Acceptable	EPA 6010B 2 1996	8/9/2022	0.829	1330	257	jcg



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.





## Final Evaluation Report

Study: **SOIL-119**

ERA Customer Number: **E772828**

Laboratory Name: **Energy Laboratories**

## Organic Results



All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.

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**SOIL Gasoline Range Organics (GRO) in Soil (cat# 630, lot# D119-763)**

9408	Gasoline Range Organics (GRO)	mg/kg	646	1090	109 - 1440	Acceptable	EPA 8015C 3 2007	7/29/2022	-0.524	774	244	adw
4375	Benzene in GRO	mg/kg		4.82	0.00 - 8.85	Not Reported				2.20	2.22	
4765	Ethylbenzene in GRO	mg/kg		18.3	0.00 - 32.3	Not Reported				14.7	5.88	
5140	Toluene in GRO	mg/kg		55.5	0.00 - 81.1	Not Reported				33.1	16.0	
5260	Xylenes, total in GRO	mg/kg		93.8	1.96 - 145	Not Reported				73.4	23.8	

**SOIL Diesel Range Organics (DRO) in Soil (cat# 631, lot# D119-765)**

9369	Diesel Range Organics (DRO)	mg/kg	1070	1610	411 - 1930	Acceptable	EPA 8015C 3 2007	7/29/2022	-0.304	1170	327	dse
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All analytes except for 1,1-Biphenyl, Acetophenone, Atrazine, Benzaldehyde and Caprolactam in the Base/Neutrals & Acids, catalog # 467, Lithium in the Metals, cat # 620, and Nitrite as N and Nitrate + Nitrite as N in the Anions, cat # 873, are included in ERA's A2LA accreditation. Lab Code 1539.01.



# CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for

**SOIL-119**

**Energy Laboratories**

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 259 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Diesel Range Organics  
(DRO) in Soil

Gasoline Range Organics  
(GRO) in Soil

Metals in Soil

Nutrients in Soil



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Craig Huff  
Senior Technical Manager