



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

**SOIL-111**  **Final Report**

**Soil/Hazardous Waste Proficiency Testing**

**Soil Study**

**Open Date: 07/20/20**

**Close Date: 09/03/20**

**Report Issued Date: 09/10/20**



A Waters Company

September 10, 2020

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

Enclosed is your final report for ERA's SOIL-111 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-111 Proficiency Testing study have been evaluated using the following tiered approach. If the analyte is listed in the most current NELAC 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 NELAC 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-111 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 "Matthew Seebeck".

Matthew Seebeck  
Quality Officer

attachments



A Waters Company

<b>Report Recipient</b>	<b>Contact/Phone Number</b>	<b>Reporting Type</b>
Florida	Vanessa Soto / 904-791-1599	All Analytes
Idaho	Ernie Bader / 208-334-2235 x 290	All Analytes
Montana	Russell Leu / 406-444-5259	All Analytes
Nebraska	Laurie Wieting / 402-471-8407	All Analytes
Nevada	Paige Menicucci / 775-687-9311	All Analytes
New Mexico (WP)	Barbara Cooney / 505-827-0212	All Analytes
Oregon	Travis Bartholomew / 503-693-4122	All Analytes
South Dakota	Stacy Ellwanger / 605-773-4757	All Analytes
Texas	Frank Jamison / (512) 239-3754	All Analytes
Utah	Cathy Mitchell / (801) 965-2588	All Analytes



# SOIL-111 Definitions & Study Discussion

**Study Dates: 07/20/20 - 09/03/20**

**Report Issued: 09/10/20**

## 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 NELAC 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 2009 TNI Standards. 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 NELAC FoPT table or ERA's SOP for the Generation of Performance Acceptance Limits™ as applicable. This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.

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-111 Proficiency Testing (PT) study has been reviewed by ERA senior management and certified compliant with the requirements of the 2009 TNI PT Standard and the 2016 TNI Standard, Volume 3, Section 5.9 and the criteria contained in the most current NELAC Fields of Proficiency Testing (FoPT) table.

ERA's SOIL-111 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 2009 TNI PT Standard and the criteria contained in the most current NELAC FoPT table.

All analytes are included in ERA's A2LA accreditation, certification number 1539.01.

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-111 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-111 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>09/10/20</b>
<b>Study Dates:</b>	<b>07/20/20 - 09/03/20</b>

## Not Acceptable Evaluations

There were no Not Acceptable evaluations for this study.



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# Final Report Results For Laboratory Energy Laboratories





# Final Evaluation Report

## Study: **SOIL-111**

ERA Customer Number: **E772828**

Laboratory Name: **Energy Laboratories**

## Inorganic Results





# SOIL-111 Final Evaluation Report

A Waters Company

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**Quality Assurance Manager**  
**Energy Laboratories**  
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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# D111-540)**

1000	Aluminum	mg/kg		10100	4050 - 12200	Not Reported				8110	1920	
1005	Antimony	mg/kg		269	26.9 - 336	Not Reported				134	80.1	
1010	Arsenic	mg/kg		185	119 - 221	Not Reported				170	17.8	
1015	Barium	mg/kg		193	138 - 229	Not Reported				183	17.0	
1020	Beryllium	mg/kg	109	122	87.0 - 145	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.699	116	9.98	jcg
1025	Boron	mg/kg	195	273	120 - 300	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.224	200	22.2	jcg
1030	Cadmium	mg/kg	83.6	98.3	67.1 - 112	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.811	89.5	7.27	jcg
1035	Calcium	mg/kg		5190	3490 - 6120	Not Reported				4810	474	
1040	Chromium	mg/kg	94.1	107	70.6 - 131	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.637	101	10.6	jcg
1050	Cobalt	mg/kg		90.2	63.6 - 106	Not Reported				84.8	7.36	
1055	Copper	mg/kg		155	112 - 186	Not Reported				149	13.9	
1070	Iron	mg/kg		15000	4920 - 23200	Not Reported				14100	3560	
1075	Lead	mg/kg	132	142	101 - 179	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.606	140	13.2	jcg
1085	Magnesium	mg/kg		2570	1460 - 3240	Not Reported				2350	313	
1090	Manganese	mg/kg		680	505 - 791	Not Reported				648	52.3	
1095	Mercury	mg/kg		23.5	9.34 - 25.8	Not Reported				15.6	1.70	
1100	Molybdenum	mg/kg		108	66.2 - 123	Not Reported				94.3	8.82	
1105	Nickel	mg/kg	63.7	76.1	47.8 - 88.8	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.742	68.3	6.16	jcg
1125	Potassium	mg/kg	1930	2420	1210 - 2880	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.335	2050	344	jcg
1140	Selenium	mg/kg		194	124 - 240	Not Reported				182	16.0	



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**SOIL Metals in Soil (cat# 620, lot# D111-540) (Continued)**

1150	Silver	mg/kg	47.8	52.6	35.1 - 65.2	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.408	50.1	5.75	jcg
1155	Sodium	mg/kg	123	161	48.1 - 223	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.573	136	22.0	jcg
1160	Strontium	mg/kg	173	180	122 - 213	Acceptable	EPA 6010B 2 1996	7/28/2020	0.378	167	14.9	jcg
1165	Thallium	mg/kg		95.3	57.9 - 118	Not Reported				87.7	7.41	
1175	Tin	mg/kg	64.6	77.7	36.5 - 102	Acceptable	EPA 6010B 2 1996	7/28/2020	-0.494	69.3	9.49	jcg
1180	Titanium	mg/kg		433	0.00 - 670	Not Reported				324	115	
3055	Uranium	mg/kg		31.3	20.8 - 41.7	Not Reported				31.3	3.49	
1185	Vanadium	mg/kg		165	111 - 196	Not Reported				153	16.1	
1190	Zinc	mg/kg		238	159 - 296	Not Reported				228	21.5	



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**SOIL Metals in Soil (cat# 620, lot# D111-540)**

1000	Aluminum	mg/kg	8570	10100	4050 - 12200	Acceptable	EPA 6020A 1 2007	8/27/2020	0.239	8110	1920	jcg
1005	Antimony	mg/kg	74.9	269	26.9 - 336	Acceptable	EPA 6020A 1 2007	8/27/2020	-0.742	134	80.1	jcg
1010	Arsenic	mg/kg	182	185	119 - 221	Acceptable	EPA 6020A 1 2007	8/27/2020	0.659	170	17.8	jcg
1015	Barium	mg/kg	199	193	138 - 229	Acceptable	EPA 6020A 1 2007	8/27/2020	0.923	183	17.0	jcg
1020	Beryllium	mg/kg	115	122	87.0 - 145	Acceptable	EPA 6020A 1 2007	8/27/2020	-0.0981	116	9.98	jcg
1025	Boron	mg/kg	211	273	120 - 300	Acceptable	EPA 6020A 1 2007	8/27/2020	0.495	200	22.2	jcg
1030	Cadmium	mg/kg	89.4	98.3	67.1 - 112	Acceptable	EPA 6020A 1 2007	8/27/2020	-0.0135	89.5	7.27	jcg
1035	Calcium	mg/kg	4956	5190	3490 - 6120	Acceptable	EPA 6020A 1 2007	8/27/2020	0.309	4810	474	jcg
1040	Chromium	mg/kg	104	107	70.6 - 131	Acceptable	EPA 6020A 1 2007	8/27/2020	0.293	101	10.6	jcg
1050	Cobalt	mg/kg	94	90.2	63.6 - 106	Acceptable	EPA 6020A 1 2007	8/27/2020	1.25	84.8	7.36	jcg
1055	Copper	mg/kg	162	155	112 - 186	Acceptable	EPA 6020A 1 2007	8/27/2020	0.939	149	13.9	jcg
1070	Iron	mg/kg	15910	15000	4920 - 23200	Acceptable	EPA 6020A 1 2007	8/27/2020	0.516	14100	3560	jcg
1075	Lead	mg/kg	143	142	101 - 179	Acceptable	EPA 6020A 1 2007	8/27/2020	0.227	140	13.2	jcg
1085	Magnesium	mg/kg	2692	2570	1460 - 3240	Acceptable	EPA 6020A 1 2007	8/27/2020	1.09	2350	313	jcg
1090	Manganese	mg/kg	681	680	505 - 791	Acceptable	EPA 6020A 1 2007	8/27/2020	0.630	648	52.3	jcg
1095	Mercury	mg/kg		23.5	9.34 - 25.8	Not Reported				15.6	1.70	
1100	Molybdenum	mg/kg	95.5	108	66.2 - 123	Acceptable	EPA 6020A 1 2007	8/27/2020	0.131	94.3	8.82	jcg
1105	Nickel	mg/kg	75.2	76.1	47.8 - 88.8	Acceptable	EPA 6020A 1 2007	8/27/2020	1.12	68.3	6.16	jcg
1125	Potassium	mg/kg	2128	2420	1210 - 2880	Acceptable	EPA 6020A 1 2007	8/27/2020	0.240	2050	344	jcg
1140	Selenium	mg/kg	196	194	124 - 240	Acceptable	EPA 6020A 1 2007	8/27/2020	0.872	182	16.0	jcg



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# SOIL-111 Final Evaluation Report

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**09/10/20**  
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**SOIL Metals in Soil (cat# 620, lot# D111-540) (Continued)**

1150	Silver	mg/kg	54	52.6	35.1 - 65.2	Acceptable	EPA 6020A 1 2007	8/27/2020	0.670	50.1	5.75	jcg
1155	Sodium	mg/kg	146	161	48.1 - 223	Acceptable	EPA 6020A 1 2007	8/27/2020	0.474	136	22.0	jcg
1160	Strontium	mg/kg	183	180	122 - 213	Acceptable	EPA 6020A 1 2007	8/27/2020	1.05	167	14.9	jcg
1165	Thallium	mg/kg	82.9	95.3	57.9 - 118	Acceptable	EPA 6020A 1 2007	8/27/2020	-0.653	87.7	7.41	jcg
1175	Tin	mg/kg	72.9	77.7	36.5 - 102	Acceptable	EPA 6020A 1 2007	8/27/2020	0.381	69.3	9.49	jcg
1180	Titanium	mg/kg	362	433	0.00 - 670	Acceptable	EPA 6020A 1 2007	8/27/2020	0.330	324	115	jcg
3055	Uranium	mg/kg	30.6	31.3	20.8 - 41.7	Acceptable	EPA 6020A 1 2007	8/27/2020	-0.192	31.3	3.49	jcg
1185	Vanadium	mg/kg	153	165	111 - 196	Acceptable	EPA 6020A 1 2007	8/27/2020	-0.0228	153	16.1	jcg
1190	Zinc	mg/kg	248	238	159 - 296	Acceptable	EPA 6020A 1 2007	8/27/2020	0.949	228	21.5	jcg



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**SOIL Metals in Soil (cat# 620, lot# D111-540)**

1000	Aluminum	mg/kg	8119	10100	4050 - 12200	Acceptable	EPA 6010B 2 1996	8/6/2020	0.00409	8110	1920	meh
1005	Antimony	mg/kg	68.2	269	26.9 - 336	Acceptable	EPA 6010B 2 1996	8/6/2020	-0.825	134	80.1	meh
1010	Arsenic	mg/kg	189	185	119 - 221	Acceptable	EPA 6010B 2 1996	8/6/2020	1.05	170	17.8	meh
1015	Barium	mg/kg	204	193	138 - 229	Acceptable	EPA 6010B 2 1996	8/6/2020	1.22	183	17.0	meh
1020	Beryllium	mg/kg		122	87.0 - 145	Not Reported				116	9.98	
1025	Boron	mg/kg		273	120 - 300	Not Reported				200	22.2	
1030	Cadmium	mg/kg		98.3	67.1 - 112	Not Reported				89.5	7.27	
1035	Calcium	mg/kg	5150	5190	3490 - 6120	Acceptable	EPA 6010B 2 1996	8/6/2020	0.719	4810	474	meh
1040	Chromium	mg/kg		107	70.6 - 131	Not Reported				101	10.6	
1050	Cobalt	mg/kg	89.2	90.2	63.6 - 106	Acceptable	EPA 6010B 2 1996	8/6/2020	0.598	84.8	7.36	meh
1055	Copper	mg/kg	149	155	112 - 186	Acceptable	EPA 6010B 2 1996	8/6/2020	0.00389	149	13.9	meh
1070	Iron	mg/kg	15170	15000	4920 - 23200	Acceptable	EPA 6010B 2 1996	8/6/2020	0.308	14100	3560	meh
1075	Lead	mg/kg		142	101 - 179	Not Reported				140	13.2	
1085	Magnesium	mg/kg	2425	2570	1460 - 3240	Acceptable	EPA 6010B 2 1996	8/6/2020	0.240	2350	313	meh
1090	Manganese	mg/kg	686	680	505 - 791	Acceptable	EPA 6010B 2 1996	8/6/2020	0.726	648	52.3	meh
1095	Mercury	mg/kg		23.5	9.34 - 25.8	Not Reported				15.6	1.70	
1100	Molybdenum	mg/kg	92.5	108	66.2 - 123	Acceptable	EPA 6010B 2 1996	8/6/2020	-0.209	94.3	8.82	meh
1105	Nickel	mg/kg		76.1	47.8 - 88.8	Not Reported				68.3	6.16	
1125	Potassium	mg/kg		2420	1210 - 2880	Not Reported				2050	344	
1140	Selenium	mg/kg	180	194	124 - 240	Acceptable	EPA 6010B 2 1996	8/6/2020	-0.126	182	16.0	meh



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**SOIL Metals in Soil (cat# 620, lot# D111-540) (Continued)**

1150	Silver	mg/kg		52.6	35.1 - 65.2	Not Reported				50.1	5.75	
1155	Sodium	mg/kg		161	48.1 - 223	Not Reported				136	22.0	
1160	Strontium	mg/kg		180	122 - 213	Not Reported				167	14.9	
1165	Thallium	mg/kg		95.3	57.9 - 118	Not Reported				87.7	7.41	
1175	Tin	mg/kg		77.7	36.5 - 102	Not Reported				69.3	9.49	
1180	Titanium	mg/kg	357	433	0.00 - 670	Acceptable	EPA 6010B 2 1996	8/6/2020	0.287	324	115	meh
3055	Uranium	mg/kg		31.3	20.8 - 41.7	Not Reported				31.3	3.49	
1185	Vanadium	mg/kg	155	165	111 - 196	Acceptable	EPA 6010B 2 1996	8/6/2020	0.102	153	16.1	meh
1190	Zinc	mg/kg	230	238	159 - 296	Acceptable	EPA 6010B 2 1996	8/6/2020	0.114	228	21.5	meh

**SOIL Nutrients in Soil (cat# 869, lot# D111-542)**

1515	Ammonia as N	mg/kg		902	479 - 1170	Not Reported				827	76.2	
1795	Total Kjeldahl Nitrogen	mg/kg		1720	957 - 2490	Not Reported				1730	191	
2040	Total Organic Carbon (TOC)	mg/kg		4340	1690 - 6980	Not Reported				4340	881	
1910	Total Phosphorus	mg/kg	976	1010	238 - 1710	Acceptable	EPA 6010B 2 1996	7/28/2020	0.0456	972	88.9	jcg

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## Final Evaluation Report

Study: **SOIL-111**

ERA Customer Number: **E772828**

Laboratory Name: **Energy Laboratories**

## Organic Results





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**Report Issued:** 09/10/20  
**Study Dates:** 07/20/20 - 09/03/20

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 Gasoline Range Organics (GRO) in Soil (cat# 630, lot# D111-763)**

9408	Gasoline Range Organics (GRO)	mg/kg	166	459	45.9 - 639	Acceptable	EPA 8015C 3 2007	7/28/2020	-0.759	264	129	adw
4375	Benzene in GRO	mg/kg		2.03	0.00 - 2.23	Not Reported				0.702	0.305	
4765	Ethylbenzene in GRO	mg/kg		7.72	0.869 - 9.00	Not Reported				4.94	1.36	
5140	Toluene in GRO	mg/kg		23.4	0.00 - 25.7	Not Reported				11.7	3.97	
5260	Xylenes, total in GRO	mg/kg		39.5	6.20 - 46.4	Not Reported				26.3	6.69	

**SOIL Diesel Range Organics (DRO) in Soil (cat# 631, lot# D111-765)**

9369	Diesel Range Organics (DRO)	mg/kg	640	890	239 - 1170	Acceptable	EPA 8015C 3 2007	7/25/2020	-0.373	705	174	dcj
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This report is scored by the criteria in the 2016 TNI Standard, Volume 3, instead of by the criteria in the 2009 TNI Standard to which the Proficiency Testing Provider is accredited. This is a planned change and is endorsed by the TNI Proficiency Testing Program Executive Committee for transition to the 2016 TNI Standard.



# CERTIFICATE OF EXCELLENCE

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

**SOIL-111**

**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 281 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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Matthew Seebeck  
Quality Officer