

# PERFORMANCE EVALUATION



Scheduled Study

## WP16-3B

06-Jul-2016 Through 19-Aug-2016

**49732057**

RTC Labcode

**TX01520**

EPA Labcode

### Participating Laboratory:

Energy Laboratories-College Station  
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Thank you for participating in study WP16-3B. Additional information about this study may be found online at [www.sigmaaldrich.com/pt](http://www.sigmaaldrich.com/pt).

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Sincerely,

A handwritten signature in black ink, appearing to read "Jennifer Duhon".

Jennifer Duhon  
Proficiency Testing Supervisor

## Accreditors

Evaluations of this dataset will be sent to the accreditor(s) listed below using your laboratory's labcode listed above each accrediting agency. If any of the information listed below is incorrect, please contact RTC immediately.

### Accredating Labcode

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**Demands**

**Method:EPA 410.4 2 (1993) [10077404]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Chemical oxygen demand (COD) <sup>1,2</sup> 1565 / PE1130-20ML - Lot LRAB0836 /Analyst:PH/ Analysis Date: 2016-08-04	187 mg/L	200	165 to 236	-1.1	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:0.9843, b:-0.3171, c:0.0432, d:3.0191</i>

**Method:SM 5210 B 22nd ED (2011) [20135017]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
5-day BOD <sup>1,2</sup> 1530 / PE1130-20ML - Lot LRAB0836 /Analyst:RA/ Analysis Date: 2016-08-04	134 mg/L	125	67.4 to 182	0.47	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:0.6237, b:0.7022, c:0.0928, d:0.6636</i>
Carbonaceous BOD (CBOD) <sup>1,2</sup> 1555 / PE1130-20ML - Lot LRAB0836 /Analyst:RA/ Analysis Date: 2016-08-04	125 mg/L	113	53 to 173	0.6	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:0.5648, b:0.6665, c:0.0965, d:0.8253</i>

**Minerals**

**Method:EPA 200.7 4.4 (1994) [10013806]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Calcium, Ca <sup>1,2</sup> 1035 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	20.4 mg/L	20.1	17.1 to 23.1	0.3	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>					
Magnesium, Mg <sup>1,2</sup> 1085 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	17.4 mg/L	18.1	15.4 to 20.8	-0.77	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>					
Potassium, K <sup>1,2</sup> 1125 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	16.7 mg/L	17	13.6 to 20.4	-0.27	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:1, b:0, c:0.0666, d:0</i>					
Sodium, Na <sup>1,2</sup> 1155 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	62.9 mg/L	71.7	57.4 to 86	-1.84	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:1, b:0, c:0.0666, d:0</i>					

**Method:EPA 300.0 2.1 (1993) [10053200]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Bromide <sup>1,2</sup> 1540 / PE1060-20ML - Lot LRAA9632 /Analyst:PH/ Analysis Date: 2016-08-01	5.20 mg/L	4.93	4.06 to 5.79	0.94	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:1.0098, b:-0.0533, c:0.0400, d:0.0912</i>					
Chloride <sup>1,2</sup> 1575 / PE1060-20ML - Lot LRAA9632 /Analyst:PH/ Analysis Date: 2016-08-01	105 mg/L	108	94.4 to 121	-0.68	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:1.005, b:0.0490, c:0.0376, d:0.3716</i>					
Fluoride <sup>1,2</sup> 1730 / PE1060-20ML - Lot LRAA9632 /Analyst:RA/ Analysis Date: 2016-08-11	0.97 mg/L	1.07	0.83 to 1.31	-1.25	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:0.9748, b:0.0156, c:0.0487, d:0.0277</i>					

Sulfate <sup>1,2</sup>	87.3 mg/L	82.1	69.3 to 94.9	1.22	Acceptable
2000 / PE1060-20ML - Lot LRAA9632 /Analyst:PH/ Analysis Date: 2016-08-01	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9880, b:-0.2130, c:0.0473, d:0.3309</i>		

**Method:EPA 6010D (2012) [10155916]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Calcium, Ca <sup>1,2</sup>	20.4 mg/L	20.1	17.1 to 23.1	0.3	Acceptable
1035 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>		
Magnesium, Mg <sup>1,2</sup>	17.3 mg/L	18.1	15.4 to 20.8	-0.88	Acceptable
1085 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>		
Potassium, K <sup>1,2</sup>	16.9 mg/L	17	13.6 to 20.4	-0.09	Acceptable
1125 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1, b:0, c:0.0666, d:0</i>		
Sodium, Na <sup>1,2</sup>	63.4 mg/L	71.7	57.4 to 86	-1.74	Acceptable
1155 / PE1041-1KT - Lot LRAA9555 /Analyst:JR/ Analysis Date: 2016-07-27	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1, b:0, c:0.0666, d:0</i>		

**Method:SM 2320 B 22nd Ed (2011) [20045414]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Alkalinity as CaCO <sub>3</sub> <sup>1,2</sup>	160 mg/L	156	133 to 179	0.65	Acceptable
1505 / PE1041-1KT - Lot LRAA9555 /Analyst:PH/ Analysis Date: 2016-07-26	<i>Evaluation Criteria - 4</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - break:40, highPercentage:0.15, lowPercentage:0.20</i>		

**Method:SM 2340 B 21st ED (1997) [20046406]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Hardness, total as CaCO <sub>3</sub> <sup>1,2</sup>	122 mg/L	125	106 to 144	-0.48	Acceptable

1755 / PE1041-1KT - Lot LRAA9555  
 /Analyst:SS/ Analysis Date: 2016-07-28

Evaluation Criteria - 1  
 Voluntary

Evaluation Parameter - a:1, b:0, c:0.05, d:0

**Method:SM 2510 B 22nd Ed (2011) [20048413]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Specific conductance, Conductivity (25°C) <sup>1,2</sup>	581 umhos/cm	630	567 to 693	-2.33	Acceptable
1610 / PE1041-1KT - Lot LRAA9555 /Analyst:PH/ Analysis Date: 2016-07-26 Evaluation Criteria - 1 <input type="checkbox"/> Voluntary Evaluation Parameter - a:1, b:0, c:0.0333, d:0					

**Method:SM 2540 B 21st ED (1997) [20049201]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total Solids (TS) <sup>1,2</sup>	730 mg/L	722	677 to 767	0.53	Acceptable
1950 / PE3050-500ML - Lot LRAB1489 /Analyst:PH/ Analysis Date: 2016-07-26 Evaluation Criteria - 1 <input type="checkbox"/> Voluntary Evaluation Parameter - a:1.00, b:0.00, c:0.00, d:15.0					

**Method:SM 2540 C 22nd Ed (2011) [20050424]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total Dissolved Solids at 180°C (TDS) <sup>1,2</sup>	649 mg/L	633	588 to 678	1.07	Acceptable
1955 / PE3050-500ML - Lot LRAB1489 /Analyst:JC/ Analysis Date: 2016-08-03 Evaluation Criteria - 1 <input type="checkbox"/> Voluntary Evaluation Parameter - a:1, b:0, c:0, d:15.0					

**Method:SM 4500-F<sup>-</sup> D 22nd ED (2011) [20103213]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Fluoride <sup>1,2</sup>	1.04 mg/L	1.07	0.83 to 1.31	-0.37	Acceptable
1730 / PE1060-20ML - Lot LRAA9632 /Analyst:PH/ Analysis Date: 2016-08-01 Evaluation Criteria - 1 <input type="checkbox"/> Voluntary Evaluation Parameter - a:0.9748, b:0.0156, c:0.0487, d:0.0277					

**Method:SM 4500-S2<sup>-</sup> F 21st ED (2000) [20126403]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
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Sulfide <sup>1,2</sup>	5.70 mg/L	6.12	2.94 to 9.3	-0.4	Acceptable
2005 / PE1034-20ML - Lot LRAA8803 /Analyst:RA/ Analysis Date: 2016-08-12	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9657, b:-0.1271, c:0.1205, d:0.2816</i>		

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**Miscellaneous Analytes**

**Method:EPA 200.7 4.4 (1994) [10013806]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Silica as SiO <sub>2</sub> <sup>1,2</sup> 1990 / PE1078-20ML - Lot LRAA9368 /Analyst:JR/ Analysis Date: 2016-07-27	104 mg/L	102	76.5 to 127	0.24	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.08333, d:0</i>
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					

**Method:EPA 420.4 1 (1993) [10080203]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total phenolics <sup>1,2</sup> 1905 / PE1134-2ML - Lot LRAB0725 /Analyst:RA/ Analysis Date: 2016-08-02	2.10 mg/L	2.52	1.29 to 3.76	-1.02	Acceptable <i>Evaluation Parameter - a:0.6408, b:0.0250, c:0.1038, d:0.0082</i>
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					

**Method:EPA 6010D (2012) [10155916]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Silica as SiO <sub>2</sub> <sup>1,2</sup> 1990 / PE1078-20ML - Lot LRAA9368 /Analyst:JR/ Analysis Date: 2016-07-27	103 mg/L	102	76.5 to 127	0.12	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.08333, d:0</i>
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					

**Method:EPA 9040C (2002) [10244403]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
pH <sup>1,2</sup> 1900 / PE1210-100ML - Lot LRAA9691 /Analyst:PH/ Analysis Date: 2016-07-26	6.79 Units	6.8	6.6 to 7	-0.15	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0, d:0.06667</i>
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					

**Method:SM 2120 B 21st ED (2001) [20039003]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
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Color <sup>1,2</sup>	45.0 PC Units	42.1	30 to 54.3	0.72	Acceptable
1605 / PE1126-20ML - Lot LRAA9696 /Analyst:PH/ Analysis Date: 2016-08-09	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9474, b:0.6098, c:0.0367, d:2.4407</i>		

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**Method:SM 2130 B 21st ED (2001) [20042608]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Turbidity <sup>1,2</sup>	6.74 NTU	6.62	5.2 to 8.04	0.25	Acceptable
2055 / PE1081-20ML - Lot LRAA8880 /Analyst:PH/ Analysis Date: 2016-08-17	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1.0040, b:-0.0368, c:0.0475, d:0.1575</i>		

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**Method:SM 2310 B 21st ED (1997) [20044400]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Acidity, as CaCO <sub>3</sub> <sup>1,2</sup>	1320 mg/L	1360	1220 to 1500	-0.88	Acceptable
1500 / PE1269-20ML - Lot LRAA8807 /Analyst:RA/ Analysis Date: 2016-08-03	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1, b:0, c:0.3333334, d:0</i>		

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**Method:SM 2540 D 22nd Ed (2011) [20051018]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total Suspended Solids, Non-Filterable Residue (TSS) <sup>1,2</sup>	88.0 mg/L	85.6	72.8 to 98.3	0.57	Acceptable
1960 / PE3050-500ML - Lot LRAA1489 /Analyst:JC/ Analysis Date: 2016-08-03	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9728, b:-0.6338, c:0.0300, d:1.5793</i>		

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**Method:SM 2540 F 21st ED (1997) [20052000]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Settleable solids <sup>1,2</sup>	9.00 mL/L	8.55	5.71 to 11.4	0.48	Acceptable
1965 / PE1194-1EA - Lot LRAA7764 /Analyst:RA/ Analysis Date: 2016-08-04	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1.0436, b:-0.0108, c:0.0597, d:4.546</i>		

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**Method:SM 4500-Cl G 21st ED (2000) [20081407]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total residual chlorine <sup>1,2</sup>	0.816 mg/L	0.8	0.61 to 0.99	0.32	Acceptable
1940 / PE1065-2ML - Lot LRAA9386 /Analyst:RA/ Analysis Date: 2016-08-05	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9345, b:0.0392, c:0.0688, d:0.0073</i>		

**Method:SM 4500-H+ B 22nd ED (2011) [20105015]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
pH <sup>1,2</sup>	6.79 Units	6.8	6.6 to 7	-0.15	Acceptable
1900 / PE1210-100ML - Lot LRAA9691 /Analyst:PH/ Analysis Date: 2016-07-26	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1, b:0, c:0, d:0.06667</i>		

**Nutrients**

**Method:EPA 300.0 2.1 (1993) [10053200]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Nitrate as N <sup>1,2</sup> 1810 / PE1060-20ML - Lot LRAA9632 /Analyst:PH/ Analysis Date: 2016-08-01	4.27 mg/L	3.83	3.05 to 4.61	1.7	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9975, b:-0.0005, c:0.0506, d:0.0642</i>	
Nitrate+nitrite as N <sup>1,2</sup> 1820 / PE1060-20ML - Lot LRAA9632 /Analyst:PH/ Analysis Date: 2016-08-01	6.98 mg/L	6.83	5.66 to 8	0.39	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9957, b:-0.0010, c:0.0509, d:0.0400</i>	

**Method:EPA 353.2 2 (1993) [10067604]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Nitrate as N <sup>1,2</sup> 1810 / PE1195-20ML - Lot LRAA9426 /Analyst:RA/ Analysis Date: 2016-08-16	19.0 mg/L	18.9	15.8 to 21.9	0.1	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9975, b:-0.0005, c:0.0506, d:0.0642</i>	
Nitrate+nitrite as N <sup>1,2</sup> 1820 / PE1195-20ML - Lot LRAA9426 /Analyst:PH/ Analysis Date: 2016-08-11	19.0 mg/L	18.8	15.8 to 21.8	0.2	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9957, b:-0.0010, c:0.0509, d:0.0400</i>	
Nitrite as N <sup>1,2</sup> 1840 / PE1153-2ML - Lot LRAA0995 /Analyst:PH/ Analysis Date: 2016-08-11	2.06 mg/L	2.02	1.72 to 2.32	0.4	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1.0017, b:-0.0030, c:0.0377, d:0.0250</i>	

**Method:EPA 365.1 2 (1993) [10070005]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Orthophosphate as P <sup>1,2</sup> 1870 / PE1195-20ML - Lot LRAA9426 /Analyst:RA/ Analysis Date: 2016-08-12	1.93 mg/L	2.14	1.82 to 2.46	-1.96	Acceptable
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	

Phosphorus as P, total <sup>1,2</sup>	4.38 mg/L	4.33	3.59 to 5.07	0.2	Acceptable
1910 / PE1051-2ML - Lot LRAB0701 /Analyst:RA/ Analysis Date: 2016-08-12	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary		<i>Evaluation Parameter - a:0.9932, b:0.0084, c:0.0506, d:0.0254</i>		

**Petroleum Hydrocarbons**

**Method:EPA 1664A (1999) [10127807]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
n-Hexane Extractable Material (O&G) <sup>1,2</sup> 1803 / PE1083-2ML - Lot LRAB0027 /Analyst:JC/ Analysis Date: 2016-08-04	30.0 mg/L	29.9	18.4 to 41.4	0.03	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:0.9400, b:-0.4166, c:0.0545, d:2.0789</i>					

**Method:TNRCC 1005 3 (2001) [90019208]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Total Petroleum Hydrocarbons (TPH), (C6-C35) <sup>2</sup> 2050 / PE1619-2ML - Lot LRAA8072 /Analyst:AM/ Analysis Date: 2016-07-21	132 mg/L	115	56.6 to 172	0.88	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:0.9692, b:-1.1573, c:0.1586, d:0.3709</i>					
Total Petroleum Hydrocarbons (TPH), (C6-C35) <sup>2</sup> 2050 / PE1799-2ML - Lot LRAB1466 /Analyst:AM/ Analysis Date: 2016-07-21	15.6 mg/L	16	8.14 to 23.8	-0.15	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:0.9692, b:0, c:0.1586, d:0</i>					
Diesel-range total petroleum hydrocarbons, >C12-C28 <sup>2</sup> 9372 / PE1619-2ML - Lot LRAA8072 /Analyst:AM/ Analysis Date: 2016-07-21	79.1 mg/L	80.7	39.4 to 122	-0.12	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:0.9692, b:-1.1573, c:0.1586, d:0.3709</i>					
Diesel-range total petroleum hydrocarbons, >C12-C28 <sup>2</sup> 9372 / PE1799-2ML - Lot LRAB1466 /Analyst:AM/ Analysis Date: 2016-07-21	8.43 mg/L	6.94	2.39 to 11.5	0.98	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:0.7700, b:-0.0082807, c:0.1644, d:0.0322339</i>					
Gasoline Range Organics, C6-C12 <sup>1,2</sup> 9408 / PE1619-2ML - Lot LRAA8072 /Analyst:AM/ Analysis Date: 2016-07-21	53.2 mg/L	42.3	19.9 to 64.7	1.46	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:0.9692, b:-1.1573, c:0.1586, d:0.3709</i>					
Gasoline Range Organics, C6-C12 <sup>1,2</sup> 9408 / PE1799-2ML - Lot LRAB1466 /Analyst:AM/ Analysis Date: 2016-07-21	7.13 mg/L	8.62	3.09 to 14.1	-0.81	Acceptable
<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary					
<i>Evaluation Parameter - a:1.0682, b:0.0213958, c:0.2285, d:0.0024231</i>					

**Trace Metals - Waste Water**

**Method: EPA 200.7 4.4 (1994) [10013806]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Antimony, Sb <sup>1,2</sup> 1005 / PE3053-500ML - Lot LRAA1769 /Analyst:JR/ Analysis Date: 2016-08-03	687 ug/L	750	624 to 875	-1.5	Acceptable <i>Evaluation Parameter - a:0.9864, b:-1.1174, c:0.0471, d:6.1230</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Arsenic, As <sup>1,2</sup> 1010 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	589 ug/L	625	530 to 720	-1.14	Acceptable <i>Evaluation Parameter - a:0.9916, b:1.2647, c:0.0422, d:5.1741</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Barium, Ba <sup>1,2</sup> 1015 / PE3053-500ML - Lot LRAA1769 /Analyst:JR/ Analysis Date: 2016-07-22	350 ug/L	384	326 to 442	-1.77	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Beryllium, Be <sup>1,2</sup> 1020 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	146 ug/L	159	135 to 183	-1.64	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Boron, B <sup>1,2</sup> 1025 / PE3053-500ML - Lot LRAA1769 /Analyst:JR/ Analysis Date: 2016-07-22	958 ug/L	1010	859 to 1160	-1.03	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Cadmium, Cd <sup>1,2</sup> 1030 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	233 ug/L	259	220 to 298	-2	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Chromium, Cr (total) <sup>1,2</sup> 1040 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	236 ug/L	255	217 to 293	-1.48	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Cobalt, Co <sup>1,2</sup> 1050 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	200 ug/L	211	179 to 243	-1.04	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			
Copper, Cu <sup>1,2</sup> 1055 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	575 ug/L	608	517 to 699	-1.09	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
		<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			

**Method: EPA 200.7 4.4 (1994) (Continued)**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Iron, Fe <sup>1,2</sup> 1070 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	503 ug/L	513	436 to 590	-0.39	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Lead, Pb <sup>1,2</sup> 1075 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	831 ug/L	856	728 to 984	-0.58	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Lithium, Li <sup>2</sup> 1080 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	858 ug/L	876	613 to 1140	-0.21	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.10, d:0</i>
Manganese, Mn <sup>1,2</sup> 1090 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	674 ug/L	745	633 to 857	-1.9	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Molybdenum, Mo <sup>1,2</sup> 1100 / PE3053-500ML - Lot LRAB1769 /Analyst:JR/ Analysis Date: 2016-07-22	275 ug/L	283	243 to 322	-0.61	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:0.9953, b:-0.1614, c:0.0372, d:2.5555</i>
Nickel, Ni <sup>1,2</sup> 1105 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	1370 ug/L	1500	1320 to 1670	-2.21	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1.0012, b:1.5795, c:0.0368, d:3.8151</i>
Selenium, Se <sup>1,2</sup> 1140 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	170 ug/L	183	156 to 210	-1.42	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Silver, Ag <sup>1,2</sup> 1150 / PE3053-500ML - Lot LRAB1769 /Analyst:JR/ Analysis Date: 2016-07-22	817 ug/L	839	713 to 965	-0.52	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Strontium, Sr <sup>1,2</sup> 1160 / PE3053-500ML - Lot LRAB1769 /Analyst:JR/ Analysis Date: 2016-07-22	342 ug/L	376	320 to 432	-1.81	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>

**Method:EPA 200.7 4.4 (1994) (Continued)**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Thallium, Tl <sup>1,2</sup> 1165 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-22	271 ug/L	282	228 to 336	-0.61	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:0.9932, b:-0.9634, c:0.0479, d:4.2361</i>
Tin, Sn <sup>1,2</sup> 1175 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-22	396 ug/L	434	304 to 564	-0.88	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.10, d:0</i>
Titanium, Ti <sup>1,2</sup> 1180 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-22	155 ug/L	161	137 to 185	-0.75	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Vanadium, V <sup>1,2</sup> 1185 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	204 ug/L	220	187 to 253	-1.45	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Zinc, Zn <sup>1,2</sup> 1190 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	1520 ug/L	1620	1380 to 1860	-1.23	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Aluminum, Al <sup>1,2</sup> 1000 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-22	663 ug/L	698	565 to 831	-0.79	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:0.9823, b:9.5889, c:0.0471, d:11.2110</i>

**Method:EPA 6010D (2012) [10155916]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Antimony, Sb <sup>1,2</sup> 1005 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-08-03	676 ug/L	750	624 to 875	-1.76	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:0.9864, b:-1.1174, c:0.0471, d:6.1230</i>
Arsenic, As <sup>1,2</sup> 1010 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	609 ug/L	625	530 to 720	-0.5	Acceptable <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary <i>Evaluation Parameter - a:0.9916, b:1.2647, c:0.0422, d:5.1741</i>
Barium, Ba <sup>1,2</sup>	367 ug/L	384	326 to 442	-0.89	Acceptable



1015 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-21	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Beryllium, Be <sup>1,2</sup> 1020 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	153 ug/L	159	135 to 183	-0.75	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Boron, B <sup>1,2</sup> 1025 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-20	995 ug/L	1010	859 to 1160	-0.3	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Cadmium, Cd <sup>1,2</sup> 1030 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	242 ug/L	259	220 to 298	-1.31	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Chromium, Cr (total) <sup>1,2</sup> 1040 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	243 ug/L	255	217 to 293	-0.94	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Cobalt, Co <sup>1,2</sup> 1050 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	207 ug/L	211	179 to 243	-0.38	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Copper, Cu <sup>1,2</sup> 1055 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	593 ug/L	608	517 to 699	-0.49	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	

**Method: EPA 6010D (2012) (Continued)**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Iron, Fe <sup>1,2</sup> 1070 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	502 ug/L	513	436 to 590	-0.43	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Lead, Pb <sup>1,2</sup> 1075 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	829 ug/L	856	728 to 984	-0.63	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Lithium, Li <sup>2</sup> 1080 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	890 ug/L	876	613 to 1140	0.16	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.10, d:0</i>	
Manganese, Mn <sup>1,2</sup> 1090 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	705 ug/L	745	633 to 857	-1.07	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Molybdenum, Mo <sup>1,2</sup> 1100 / PE3053-500ML - Lot LRAB1769 /Analyst:JR/ Analysis Date: 2016-07-21	262 ug/L	283	243 to 322	-1.6	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:0.9953, b:-0.1614, c:0.0372, d:2.5555</i>	
Nickel, Ni <sup>1,2</sup> 1105 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	1410 ug/L	1500	1320 to 1670	-1.53	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1.0012, b:1.5795, c:0.0368, d:3.8151</i>	
Selenium, Se <sup>1,2</sup> 1140 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	175 ug/L	183	156 to 210	-0.87	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Silver, Ag <sup>1,2</sup> 1150 / PE3053-500ML - Lot LRAB1769 /Analyst:JR/ Analysis Date: 2016-07-21	843 ug/L	839	713 to 965	0.1	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	
Strontium, Sr <sup>1,2</sup> 1160 / PE3053-500ML - Lot LRAB1769 /Analyst:JR/ Analysis Date: 2016-07-21	367 ug/L	376	320 to 432	-0.48	Acceptable
	<i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary			<i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>	

**Method:EPA 6010D (2012) (Continued)**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Thallium, Tl <sup>1,2</sup> 1165 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-21	281 ug/L	282 <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary	228 to 336	-0.06	Acceptable <i>Evaluation Parameter - a:0.9932, b:-0.9634, c:0.0479, d:4.2361</i>
Tin, Sn <sup>1,2</sup> 1175 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-21	395 ug/L	434 <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary	304 to 564	-0.9	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.10, d:0</i>
Titanium, Ti <sup>1,2</sup> 1180 / PE3053-500ML - Lot LRA1769 /Analyst:JR/ Analysis Date: 2016-07-22	158 ug/L	161 <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary	137 to 185	-0.37	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Vanadium, V <sup>1,2</sup> 1185 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	216 ug/L	220 <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary	187 to 253	-0.36	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Zinc, Zn <sup>1,2</sup> 1190 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	1570 ug/L	1620 <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary	1380 to 1860	-0.62	Acceptable <i>Evaluation Parameter - a:1, b:0, c:0.05, d:0</i>
Aluminum, Al <sup>1,2</sup> 1000 / PE3132-500ML - Lot LRAA9472 /Analyst:JR/ Analysis Date: 2016-07-21	685 ug/L	698 <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary	565 to 831	-0.29	Acceptable <i>Evaluation Parameter - a:0.9823, b:9.5889, c:0.0471, d:11.2110</i>

**Method:SM 3500-Cr B 21st ED (2001) [20066006]**

Analyte	Result Units	Assigned Value	Accept. Window	Z	Evaluation
Chromium VI, Cr(VI) <sup>1,2</sup> 1045 / PE1088-20ML - Lot LRA10103 /Analyst:PH/ Analysis Date: 2016-07-26	376 ug/L	405 <i>Evaluation Criteria - 1</i> <input type="checkbox"/> Voluntary	340 to 470	-1.34	Acceptable <i>Evaluation Parameter - a:0.9917, b:1.0232, c:0.0476, d:2.2011</i>

## Sample Information

### DEMAND - WP

PE1130-20ML / Lot LRAB0836

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
5-day BOD <sup>1,2</sup> 1530 Demands	mg/L	199±1.02	124	18.3
Carbonaceous BOD (CBOD) <sup>1,2</sup> 1555 Demands	mg/L	199±1.02	119	15.1
Chemical oxygen demand (COD) <sup>1,2</sup> 1565 Demands	mg/L	204±1.04	204	9.82
Dissolved organic carbon (DOC) <sup>1,2</sup> 1710 Demands	mg/L	80.6±0.411	80.1	6.29
Total organic carbon (TOC) <sup>1,2</sup> 2040 Demands	mg/L	80.6±0.411	80.5	4.65
5-day BOD <sup>1,2</sup> 1530 Miscellaneous Analytes	mg/L	199±1.02	124	18.3
Carbonaceous BOD (CBOD) <sup>1,2</sup> 1555 Miscellaneous Analytes	mg/L	199±1.02	119	15.1
Chemical oxygen demand (COD) <sup>1,2</sup> 1565 Miscellaneous Analytes	mg/L	204±1.04	204	9.82
Total organic carbon (TOC) <sup>1,2</sup> 2040 Miscellaneous Analytes	mg/L	80.6±0.411	80.5	4.65

**MINERALS - WP**

PE1041-1KT / Lot LRAA9555

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Calcium, Ca <sup>1,2</sup> 1035 Minerals	mg/L	20.1±0.103	19.8	1.32
Magnesium, Mg <sup>1,2</sup> 1085 Minerals	mg/L	18.1±0.092	17.5	0.65
Potassium, K <sup>1,2</sup> 1125 Minerals	mg/L	17±0.081	15.9	0.81
Sodium, Na <sup>1,2</sup> 1155 Minerals	mg/L	71.7±0.366	72	5.94
Alkalinity as CaCO <sub>3</sub> <sup>1,2</sup> 1505 Minerals	mg/L	156±0.795	153	6.2
Calcium hardness as CaCO <sub>3</sub> <sup>1,2</sup> 1550 Minerals	mg/L	50.2±0.256	50.1	4.05
Specific conductance, Conductivity (25°C) <sup>1,2</sup> 1610 Minerals	umhos/cm	630±2.09	618	13
Hardness <sup>2</sup> 1750 Minerals	mg/L	125±0.636	119	6.68
Hardness, total as CaCO <sub>3</sub> <sup>1,2</sup> 1755 Minerals	mg/L	125±0.636	121	6.23
Calcium, Ca <sup>1,2</sup> 1035	mg/L	20.1±0.103	19.8	1.32
Magnesium, Mg <sup>1,2</sup> 1085	mg/L	18.1±0.092	17.5	0.65
Potassium, K <sup>1,2</sup> 1125	mg/L	17±0.081	15.9	0.81
Sodium, Na <sup>1,2</sup> 1155	mg/L	71.7±0.366	72	5.94
Alkalinity as CaCO <sub>3</sub> <sup>1,2</sup> 1505	mg/L	156±0.795	153	6.2
Calcium hardness as CaCO <sub>3</sub> <sup>1,2</sup> 1550	mg/L	50.2±0.256	50.1	4.05
Specific conductance, Conductivity (25°C) <sup>1,2</sup> 1610	umhos/cm	630±2.09	618	13
Hardness, total as CaCO <sub>3</sub> <sup>1,2</sup> 1755	mg/L	125±0.636	121	6.23

**PH - WP - 100ML**

PE1210-100ML / Lot LRAA9691

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
pH <sup>1,2</sup> 1900 Miscellaneous Analytes	Units	6.80±0.035	6.82	0.04

**SIMPLE NUTRIENTS - WP**

PE1195-20ML / Lot LRAA9426

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Ammonia as N <sup>1,2</sup> 1515 Nutrients	mg/L	6.72±0.034	6.8	0.49
Nitrate as N <sup>1,2</sup> 1810 Nutrients	mg/L	18.9±0.096	18.8	1.18
Nitrate+nitrite as N <sup>1,2</sup> 1820 Nutrients	mg/L	18.9±0.096	18.6	1.25
Orthophosphate as P <sup>1,2</sup> 1870 Nutrients	mg/L	2.14±0.011	2.1	0.16
Ammonia as N <sup>1,2</sup> 1515	mg/L	6.72±0.034	6.8	0.49
Nitrate as N <sup>1,2</sup> 1810	mg/L	18.9±0.096	18.8	1.18
Nitrate+nitrite as N <sup>1,2</sup> 1820	mg/L	18.9±0.096	18.6	1.25
Orthophosphate as P <sup>1,2</sup> 1870	mg/L	2.14±0.011	2.1	0.16

**COMPLEX NUTRIENTS - WP**

PE1051-2ML / Lot LRAB0701

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Kjeldahl nitrogen, total (TKN) <sup>1,2</sup> 1795 Nutrients	mg/L	22.8±0.116	23.4	2.64
Organic nitrogen <sup>1,2</sup> 1865 Nutrients	mg/L	22.8±0.116	24.8	2.38
Nitrogen, total <sup>2</sup> 1827 Nutrients	mg/L	22.8±0.116	23.4	1.25
Phosphorus as P, total <sup>1,2</sup> 1910 Nutrients	mg/L	4.35±0.021	4.35	0.31



**NITRITE - WP**

PE1153-2ML / Lot LRAB0995

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Nitrite as N <sup>1,2</sup> 1840 Nutrients	mg/L	2.02±0.01	1.97	0.11
Nitrite as N <sup>1,2</sup> 1840	mg/L	2.02±0.01	1.97	0.11

**OIL & GREASE - WP**

PE1083-2ML / Lot LRAB0027

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
n-Hexane Extractable Material (O&G) <sup>1,2</sup> 1803 Petroleum Hydrocarbons	mg/L	32.25±0.16	29.5	4.27
Silica Gel Treated n-Hexane Extractable Material (Non-polar Material) <sup>1,2</sup> 6142 Miscellaneous Analytes	mg/L	16.13±0.082	13.8	2.82
n-Hexane Extractable Material (O&G) <sup>1,2</sup> 1803 Miscellaneous Analytes	mg/L	32.25±0.16	29.5	4.27
C10-C32 Hydrocarbons <sup>1,2</sup> 2050 Miscellaneous Analytes	mg/L	32.25±0.16	0	0

**RESIDUE - WP**

PE3050-500ML / Lot LRAB1489

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Total Solids (TS) <sup>1,2</sup> 1950 Minerals	mg/L	722±3.68	741	16.2
Total Dissolved Solids at 180°C (TDS) <sup>1,2</sup> 1955 Minerals	mg/L	633±3.23	643	24.7
Total Suspended Solids, Non-Filterable Residue (TSS) <sup>1,2</sup> 1960 Miscellaneous Analytes	mg/L	88.6±0.452	89.8	3.34
Total Solids (TS) <sup>1,2</sup> 1950	mg/L	722±3.68	741	16.2
Total Dissolved Solids at 180°C (TDS) <sup>1,2</sup> 1955	mg/L	633±3.23	643	24.7
Total Suspended Solids, Non-Filterable Residue (TSS) <sup>1,2</sup> 1960	mg/L	88.6±0.452	89.8	3.34

**TOTAL PHENOLICS - WP**

PE1134-2ML / Lot LRAB0725

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Total phenolics <sup>1,2</sup> 1905 Miscellaneous Analytes	mg/L	3.9±0.0199	2.66	0.72

**TOTAL RESIDUAL CHLORINE - WP**

PE1065-2ML / Lot LRAA9386

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Total residual chlorine <sup>1,2</sup> 1940 Miscellaneous Analytes	mg/L	0.82±0.005	0.79	0.07
Residual free chlorine <sup>1,2</sup> 1945 Miscellaneous Analytes	mg/L	0.810±0.005	0.75	0.05

**CHROMIUM VI - WP**

PE1088-20ML / Lot LRAB0103

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Chromium VI, Cr(VI) <sup>1,2</sup> 1045 Trace Metals - Waste Water	ug/L	407.2±2.08	403	19.1

**ANIONS - WP**

PE1060-20ML / Lot LRAA9632

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Bromide <sup>1,2</sup> 1540 Minerals	mg/L	4.93±0.025	4.91	0.4
Chloride <sup>1,2</sup> 1575 Minerals	mg/L	107±0.545	107	4.2
Fluoride <sup>1,2</sup> 1730 Minerals	mg/L	1.08±0.006	0.98	0.06
Nitrate as NO <sub>3</sub> <sup>1,2</sup> 1805 Nutrients	mg/L	17.0±0.087	18.8	1.16
Nitrate as N <sup>1,2</sup> 1810 Nutrients	mg/L	3.84±0.020	4.13	0.21
Nitrate+nitrite as N <sup>1,2</sup> 1820 Nutrients	mg/L	6.86±0.035	7.01	0.3
Nitrite as NO <sub>2</sub> <sup>1,2</sup> 1835 Nutrients	mg/L	9.92±0.051	9.68	0.53
Nitrite as N <sup>1,2</sup> 1840 Nutrients	mg/L	2.98±0.015	2.92	0.24
Orthophosphate as P <sup>1,2</sup> 1870 Nutrients	mg/L	1.30±0.007	1.31	0.12
Sulfate <sup>1,2</sup> 2000 Minerals	mg/L	83.3±0.427	82.9	5.78
Bromide <sup>1,2</sup> 1540 Miscellaneous Analytes	mg/L	4.93±0.025	4.91	0.4
Chloride <sup>1,2</sup> 1575 Miscellaneous Analytes	mg/L	107±0.545	107	4.2
Fluoride <sup>1,2</sup> 1730 Miscellaneous Analytes	mg/L	1.08±0.006	0.98	0.06
Nitrate as N <sup>1,2</sup> 1810 Miscellaneous Analytes	mg/L	3.84±0.020	4.13	0.21
Nitrate+nitrite as N <sup>1,2</sup> 1820 Miscellaneous Analytes	mg/L	6.86±0.035	7.01	0.3
Nitrite as N <sup>1,2</sup> 1840 Miscellaneous Analytes	mg/L	2.98±0.015	2.92	0.24
Orthophosphate as P <sup>1,2</sup> 1870 Miscellaneous Analytes	mg/L	1.30±0.007	1.31	0.12
Sulfate <sup>1,2</sup> 2000 Miscellaneous Analytes	mg/L	83.3±0.427	82.9	5.78
Bromide <sup>1,2</sup> 1540 Anions - Waste Water	mg/L	4.93±0.025	4.91	0.4
Chloride <sup>1,2</sup> 1575 Anions - Waste Water	mg/L	107±0.545	107	4.2

Fluoride <sup>1,2</sup> 1730 Anions - Waste Water	mg/L	1.08±0.006	0.98	0.06
Nitrate as NO <sub>3</sub> <sup>1,2</sup> 1805 Anions - Waste Water	mg/L	17.0±0.087	18.8	1.16
Nitrate as N <sup>1,2</sup> 1810 Anions - Waste Water	mg/L	3.84±0.020	4.13	0.21
Nitrate+nitrite as N <sup>1,2</sup> 1820 Anions - Waste Water	mg/L	6.86±0.035	7.01	0.3
Nitrite as NO <sub>2</sub> <sup>1,2</sup> 1835 Anions - Waste Water	mg/L	9.92±0.051	9.68	0.53
Nitrite as N <sup>1,2</sup> 1840 Anions - Waste Water	mg/L	2.98±0.015	2.92	0.24
Orthophosphate as P <sup>1,2</sup> 1870 Anions - Waste Water	mg/L	1.30±0.007	1.31	0.12
Sulfate <sup>1,2</sup> 2000 Anions - Waste Water	mg/L	83.3±0.427	82.9	5.78



**SILICA - WP**

PE1078-20ML / Lot LRAA9368

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Silica as SiO <sub>2</sub> <sup>1,2</sup> 1990 Miscellaneous Analytes	mg/L	102	91.7	14.6

**ACIDITY - WP**

PE1269-20ML / Lot LRAA8807

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Acidity, as CaCO <sub>3</sub> <sup>1,2</sup> 1500 Miscellaneous Analytes	mg/L	1361±13.9	1360	28.9
Carbon dioxide <sup>1,2</sup> 3755 Miscellaneous Analytes	mg/L	1360	0	0
Screen (+/-) <sup>2</sup> 12100 Miscellaneous Analytes	mg/L		0	0

**SULFIDE (TOTAL AND SOLUBLE) - WP**

PE1034-20ML / Lot LRAA8803

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Sulfide <sup>1,2</sup> 2005 Minerals	mg/L	6.47±0.033	5.65	0.9
Sulfide-Screen () <sup>2</sup> 2007	mg/L	6.47±0.033	0	0
Sulfide, Soluble <sup>2</sup> 2012 Minerals	mg/L		0	0

**COLOR - WP**

PE1126-20ML / Lot LRAA9696

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Color <sup>1,2</sup> 1605 Miscellaneous Analytes	PC Units	43.8	42.6	3.18

**SETTLABLE SOLIDS - WP**

PE1194-1EA / Lot LRAA7764

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Settleable solids <sup>1,2</sup> 1965 Miscellaneous Analytes	mL/L	8.2±0.0418	8.35	0.95

**TRACE METALS 1 - WHOLE VOLUME - WP**

PE3132-500ML / Lot LRAA9472

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Arsenic, As <sup>1,2</sup> 1010 Trace Metals - Waste Water	ug/L	629±3.21	613	32.2
Beryllium, Be <sup>1,2</sup> 1020 Trace Metals - Waste Water	ug/L	159±0.810	158	6.24
Cadmium, Cd <sup>1,2</sup> 1030 Trace Metals - Waste Water	ug/L	259±1.32	257	11.6
Chromium, Cr (total) <sup>1,2</sup> 1040 Trace Metals - Waste Water	ug/L	255±1.30	254	10.9
Cobalt, Co <sup>1,2</sup> 1050 Trace Metals - Waste Water	ug/L	211±1.07	211	9.47
Copper, Cu <sup>1,2</sup> 1055 Trace Metals - Waste Water	ug/L	608±3.11	608	31.9
Iron, Fe <sup>1,2</sup> 1070 Trace Metals - Waste Water	ug/L	513±2.62	519	23.9
Lead, Pb <sup>1,2</sup> 1075 Trace Metals - Waste Water	ug/L	856±4.36	853	42
Lithium, Li <sup>2</sup> 1080 Trace Metals - Waste Water	ug/L	876±4.47	862	38.8
Manganese, Mn <sup>1,2</sup> 1090 Trace Metals - Waste Water	ug/L	745±3.80	755	38.2
Mercury, Hg <sup>1,2</sup> 1095 Trace Metals - Waste Water	ug/L	25.1±0.128	25.1	2.1
Nickel, Ni <sup>1,2</sup> 1105 Trace Metals - Waste Water	ug/L	1493±7.62	1490	75
Selenium, Se <sup>1,2</sup> 1140 Trace Metals - Waste Water	ug/L	183±0.933	180	11.8
Vanadium, V <sup>1,2</sup> 1185 Trace Metals - Waste Water	ug/L	220±1.12	220	10.6
Zinc, Zn <sup>1,2</sup> 1190 Trace Metals - Waste Water	ug/L	1620±4.47	1630	78.2
Aluminum, Al <sup>1,2</sup> 1000 Trace Metals - Waste Water	ug/L	701±3.58	701	38.3

**TPH IN WATER (HIGH LEVEL)**

PE1619-2ML / Lot LRAA8072

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
C6 Aliphatics <sup>2</sup> 30026 Petroleum Hydrocarbons	mg/L	1.39	0	0
VPH Aliphatic >C6-C8 <sup>1,2</sup> 5301 Petroleum Hydrocarbons	mg/L	6.95	0	0
EPH Aliphatic C8 to C10 <sup>1,2</sup> 6219 Petroleum Hydrocarbons	mg/L	2.32	0	0
EPH Aliphatic >C10-C12 <sup>1,2</sup> 6211 Petroleum Hydrocarbons	mg/L	8.13	0	0
EPH Aliphatic >C12-C16 <sup>1,2</sup> 6212 Petroleum Hydrocarbons	mg/L	17.01	0	0
EPH Aliphatic >C16-C21 <sup>2</sup> 6214 Petroleum Hydrocarbons	mg/L	11.34	0	0
EPH Aliphatic >C21-C34 <sup>2</sup> 6216 Petroleum Hydrocarbons	mg/L	6.50±0.641	0	0
>C7-C8 Aromatics <sup>2</sup> 8 Petroleum Hydrocarbons	mg/L	6.64	0	0
EPH Aromatics C8 to C10 <sup>2</sup> 6236 Petroleum Hydrocarbons	mg/L	5.56	0	0
EPH Aromatic >C10-C12 <sup>1,2</sup> 6224 Petroleum Hydrocarbons	mg/L	4.59	0	0
EPH Aromatic >C12-C16 <sup>1,2</sup> 6226 Petroleum Hydrocarbons	mg/L	17.12	0	0
EPH Aromatic >C16-C21 <sup>1,2</sup> 6228 Petroleum Hydrocarbons	mg/L	8.58	0	0
EPH Aromatic >C21-C34 <sup>1,2</sup> 6231 Petroleum Hydrocarbons	mg/L	18.5±0.93	0	0
RRO (Residual Range Organics, C28-C35) <sup>2</sup> 9506 Petroleum Hydrocarbons	mg/L	0±0	0	0
Total Petroleum Hydrocarbons (TPH), (C6-C35) <sup>2</sup> 2050 Petroleum Hydrocarbons	mg/L	119.34±1.1576	130	17.7
Diesel-range total petroleum hydrocarbons, >C12-C28 <sup>2</sup> 9372 Petroleum Hydrocarbons	mg/L	84.50	83.1	11.9
Gasoline Range Organics, C6-C12 <sup>1,2</sup> 9408 Petroleum Hydrocarbons	mg/L	44.84	52.9	8.21
Diesel Range Organics (DRO) <sup>1,2</sup> 9369 Petroleum Hydrocarbons	mg/L	84.50	0	0
Gasoline range organics (GRO), C5-C10 <sup>1,2</sup> 9408 Petroleum Hydrocarbons	mg/L	34.84	0	0
EPH Aliphatic C8 to C10 <sup>1,2</sup> 6219	mg/L	2.32	0	0
EPH Aliphatic >C10-C12 <sup>1,2</sup> 6211	mg/L	8.13	0	0

EPH Aliphatic >C12-C16 <sup>1,2</sup> 6212	mg/L	17.01	0	0
EPH Aliphatic >C16-C21 <sup>2</sup> 6214	mg/L	11.34	0	0
EPH Aliphatic >C21-C34 <sup>2</sup> 6216	mg/L	6.50±0.641	0	0
EPH Aromatics C8 to C10 <sup>2</sup> 6236	mg/L	5.56	0	0
EPH Aromatic >C10-C12 <sup>1,2</sup> 6224	mg/L	4.59	0	0
EPH Aromatic >C12-C16 <sup>1,2</sup> 6226	mg/L	17.12	0	0
EPH Aromatic >C16-C21 <sup>1,2</sup> 6228	mg/L	8.58	0	0
EPH Aromatic >C21-C34 <sup>1,2</sup> 6231	mg/L	18.5±0.93	0	0
Diesel-range total petroleum hydrocarbons, >C12-C28 <sup>2</sup> 9372	mg/L	84.50	83.1	11.9
Gasoline Range Organics, C6-C12 <sup>1,2</sup> 9408	mg/L	44.84	52.9	8.21
C6 Aliphatics <sup>2</sup> 30026	mg/L	1.39	0	0
VPH Aliphatic >C6-C8 <sup>1,2</sup> 5301	mg/L	6.95	0	0
>C7-C8 Aromatics <sup>2</sup> 8	mg/L	6.64	0	0
RRO (Residual Range Organics, C28-C35) <sup>2</sup> 9506	mg/L	0±0	0	0
Diesel Range Organics (DRO) <sup>1,2</sup> 9369	mg/L	84.50	0	0
Gasoline range organics (GRO), C5-C10 <sup>1,2</sup> 9408	mg/L	34.84	0	0



**TPH IN WATER (LOW LEVEL)**

PE1799-2ML / Lot LRAB1466

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
C6 Aliphatics <sup>2</sup> 30026 Petroleum Hydrocarbons	mg/L	0.300	0	0
VPH Aliphatic >C6-C8 <sup>1,2</sup> 5301 Petroleum Hydrocarbons	mg/L	2.48	0	0
EPH Aliphatic C8 to C10 <sup>1,2</sup> 6219 Petroleum Hydrocarbons	mg/L	1.15	0	0
EPH Aliphatic >C10-C12 <sup>1,2</sup> 6211 Petroleum Hydrocarbons	mg/L	0.450	0	0
EPH Aliphatic >C12-C16 <sup>1,2</sup> 6212 Petroleum Hydrocarbons	mg/L	1.82	0	0
EPH Aliphatic >C16-C21 <sup>2</sup> 6214 Petroleum Hydrocarbons	mg/L	1.21	0	0
EPH Aliphatic >C21-C34 <sup>2</sup> 6216 Petroleum Hydrocarbons	mg/L	0.300	0	0
>C7-C8 Aromatics <sup>2</sup> 8 Petroleum Hydrocarbons	mg/L	0.560	0	0
EPH Aromatics C8 to C10 <sup>2</sup> 6236 Petroleum Hydrocarbons	mg/L	0.980	0	0
EPH Aromatic >C10-C12 <sup>1,2</sup> 6224 Petroleum Hydrocarbons	mg/L	0.580	0	0
EPH Aromatic >C12-C16 <sup>1,2</sup> 6226 Petroleum Hydrocarbons	mg/L	1.83±1.21	0	0
EPH Aromatic >C16-C21 <sup>1,2</sup> 6228 Petroleum Hydrocarbons	mg/L	0.920	0	0
EPH Aromatic >C21-C34 <sup>1,2</sup> 6231 Petroleum Hydrocarbons	mg/L	0.250	0	0
RRO (Residual Range Organics, C28-C35) <sup>2</sup> 9506 Petroleum Hydrocarbons	mg/L		0	0
Total Petroleum Hydrocarbons (TPH), (C6-C35) <sup>2</sup> 2050 Petroleum Hydrocarbons	mg/L	16.5±0.16	0	0
Diesel-range total petroleum hydrocarbons, >C12-C28 <sup>2</sup> 9372 Petroleum Hydrocarbons	mg/L	9.02±0.0875	0	0
Gasoline Range Organics, C6-C12 <sup>1,2</sup> 9408 Petroleum Hydrocarbons	mg/L	8.05	0	0
Diesel Range Organics (DRO) <sup>1,2</sup> 9369 Petroleum Hydrocarbons	mg/L		0	0
C6 Aliphatics <sup>2</sup> 30026	mg/L	0.300	0	0
VPH Aliphatic >C6-C8 <sup>1,2</sup> 5301	mg/L	2.48	0	0
EPH Aliphatic C8 to C10 <sup>1,2</sup> 6219	mg/L	1.15	0	0

EPH Aliphatic >C10-C12 <sup>1,2</sup> 6211	mg/L	0.450	0	0
EPH Aliphatic >C12-C16 <sup>1,2</sup> 6212	mg/L	1.82	0	0
EPH Aliphatic >C16-C21 <sup>2</sup> 6214	mg/L	1.21	0	0
EPH Aliphatic >C21-C34 <sup>2</sup> 6216	mg/L	0.300	0	0
>C7-C8 Aromatics <sup>2</sup> 8	mg/L	0.560	0	0
EPH Aromatics C8 to C10 <sup>2</sup> 6236	mg/L	0.980	0	0
EPH Aromatic >C10-C12 <sup>1,2</sup> 6224	mg/L	0.580	0	0
EPH Aromatic >C12-C16 <sup>1,2</sup> 6226	mg/L	1.83±1.21	0	0
EPH Aromatic >C16-C21 <sup>1,2</sup> 6228	mg/L	0.920	0	0
EPH Aromatic >C21-C34 <sup>1,2</sup> 6231	mg/L	0.250	0	0
RRO (Residual Range Organics, C28-C35) <sup>2</sup> 9506	mg/L		0	0
Total Petroleum Hydrocarbons (TPH), (C6-C35) <sup>2</sup> 2050	mg/L	16.5±0.16	0	0
Diesel-range total petroleum hydrocarbons, >C12-C28 <sup>2</sup> 9372	mg/L	9.02±0.0875	0	0
Gasoline Range Organics, C6-C12 <sup>1,2</sup> 9408	mg/L	8.05	0	0
Total Petroleum Hydrocarbons (TPH), (C9-C16) <sup>1,2</sup> 2050 Petroleum Hydrocarbons - Water	mg/L		0	0
Total Petroleum Hydrocarbons (TPH), (C17-C35) <sup>1,2</sup> 2050 Petroleum Hydrocarbons - Water	mg/L		0	0

**TRACE METALS 2 - WHOLE VOLUME - WP**

PE3053-500ML / Lot LRAB1769

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Antimony, Sb <sup>1,2</sup> 1005 Trace Metals - Waste Water	ug/L	761±3.88	754	74.1
Barium, Ba <sup>1,2</sup> 1015 Trace Metals - Waste Water	ug/L	384±1.96	390	31.8
Boron, B <sup>1,2</sup> 1025 Trace Metals - Waste Water	ug/L	1010±5.15	1040	63.8
Molybdenum, Mo <sup>1,2</sup> 1100 Trace Metals - Waste Water	ug/L	284±1.45	281	18.1
Silver, Ag <sup>1,2</sup> 1150 Trace Metals - Waste Water	ug/L	839±4.28	872	45.1
Strontium, Sr <sup>1,2</sup> 1160 Trace Metals - Waste Water	ug/L	376±1.92	385	29.2
Thallium, Tl <sup>1,2</sup> 1165 Trace Metals - Waste Water	ug/L	285±1.45	283	10.8
Tin, Sn <sup>1,2</sup> 1175 Trace Metals - Waste Water	ug/L	434±2.21	430	35.6
Titanium, Ti <sup>1,2</sup> 1180 Trace Metals - Waste Water	ug/L	161±0.822	163	9.57

**TURBIDITY - WP**

PE1081-20ML / Lot LRAA8880

Analytes	Units	Gravimetric Value	Study Mean	Study Std. Dev.
Turbidity <sup>1,2</sup> 2055 Miscellaneous Analytes	NTU	6.63±0.034	6.4	0.39



## Definitions and Interpretation of Statistical Analysis:

**Assigned Value:** Value attributed to a particular quantity and accepted, sometimes by convention, as having an uncertainty appropriate for a given purpose. See ISO/IEC 17043 for additional information. In general the assigned value is the value used to assess proficiency and may or may not be the made to value (gravimetric value).

**Accept. Window:** The range of values that constitute acceptable performance for a laboratory participating in this PT study.

**Z:** A Z-Score tells how a single data point compares to normal data. A Z-Score says not only whether a point was above or below average, but how unusual the measurement is. Generally, a method result with a Z-Score less than |2| is considered to be in control, a Z-Score between |2| and |3| is considered 'Questionable', but still within control and a Z greater than |3| is considered not acceptable and the method is out of control. For WS studies, a z-score greater than |2| is unacceptable. Calculated as **Z = (Reported Value - Assigned Value) / Proficiency Std. Dev.**

**Proficiency Std. Dev.:** Standard deviation calculated based on **Evaluation Criteria.**

**Study Mean:** Statistical study mean calculated using a robust statistical model (RTC employs the 'Biweight Program'). Robust statistical techniques to minimize the influence that extreme results can have on estimates of the mean and standard deviation. NOTE - These techniques assign less weight to extreme results, rather than eliminate them from a data set.

**Study Std. Dev.:** Standard deviation calculated from study data using robust statisticals (Biweight).

**Gravimetric Value:** The 'prepared to' value, determined by gravimetric means. The uncertainty associated to this value is standard uncertainty and based on RTC's gravimetric tolerances.

## Evaluation Criteria:

**1 - Regression Equation** - Acceptance windows based on TNI adopted equation of proficiency value +/- 3 proficiency standard deviations and check limits of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c, & d as proficiency value = a \* gravimetric + b and proficiency standard deviation = c \* gravimetric + d.

**2 - Study Robust Mean and c,d regression** - Acceptance windows based on TNI adopted equation of proficiency value +/- 3 proficiency standard deviations and check limits of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation calculated from robust study mean and variables c & d as proficiency value = robust mean and proficiency standard deviation = c \* proficiency value + d.

**3 - Fixed Limits** - Acceptance windows based on span of gravimetric percentage from gravimetric as gravimetric +/- gravimetric \* percentage.

**4 - Adjustable Fixed Limits** - Acceptance windows base on a span of gravimetric percentage from gravimetric as gravimetric +/- gravimetric \* lowPercentage where gravimetric < break and gravimetric +/-

gravimetric \* highPercentage where gravimetric >= break.

**5 - Study Statistics** - Acceptance windows based on a number of standard deviations span from the study mean as study mean +/- (deviations \* standard deviation).

**6 - Log Transform Statistics** - Acceptance windows based on lognormal distributed data. Acceptance windows = mean(lognormal) +/- span \* standard deviation(lognormal).

**7 - Reserved**

**8 - Regression Equation 2SD** - Acceptance windows based on EPA equation of proficiency value +/- 2 proficiency standard deviations. Proficiency value and proficiency standard deviation are calculated from gravimetric variables a, b, c, & d as proficiency value = a \* gravimetric + b and proficiency standard deviation = c \* gravimetric + d. Generally reserved for drinking water studies.

**Proficiency Test Item Preparation, Homogeneity and Stability Assessment** - RTC uses proprietary and published methods for the manufacture, homogeneity and stability testing of proficiency test items. RTC's proficiency test materials meet requirements of ISO Guide 34. For more information contact RTC. Additionally RTC complies with TNI Volume 3 'General Requirements for Environmental Proficiency Test Providers', EL-V3-2009, 2009 for all TNI Fields of Proficiency Testing analytes.

**Metrological Traceability** - All preparations are made using balances calibrated annually traceable to NIST standards. Where appropriate analytical measurements are traceable through an unbroken chain to NIST standards, or a Certified Reference Material manufactured under ISO Guide 34 in conjunction with ISO/IEC 17025.

**Statistical Analysis** - RTC uses robust statistics to calculate study means and standard deviations - Reference - Kafadar, K, A Biweight Approach to the One-Sample Problem, Journal of the American Statistical Association, Vol. 77, No. 378, June, 1982, pp. 416-424.

**Additional Information** - Go to [www.rt-corp.com/reporting](http://www.rt-corp.com/reporting) for additional information on summary statistics for specific methods, advice on the interpretation of the statistical analysis, and additional comments/recommendations. If you failed an analyte it may be required to perform a corrective action and/or retest. RTC recommends that you contact your accreditation body for specific instruction.

Program analyte accrediting footnotes

<sup>1</sup> NELAC Compliant, covered by RTC's ANAB Proficiency Testing Provider accreditation, Cert. AP-1469

<sup>2</sup> ISO 17043 Accredited, covered by RTC's ANAB Proficiency Testing Provider accreditation, Cert AP-1469

Authorizing Officer:  \_\_\_\_\_

Date: 9/9/2016

Patrick Brumfield, ASQ CQA  
QA Manager

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**This section of the report is for informational purposes only. If you are unsure about specific accreditation requirements, please contact your state coordinator.**

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## **UNACCEPTABLE ANALYTES**



**PASS RATE**

Number of Reported Results:	96
Number of Passing Results:	96
Pass Rate:	100%