

Method PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

# Methods: 103

Sample # 231141

Phosphorous Select PT Scheme

# Labs Reporting: 19

12-40-0 MAP + Zn

### Statistical Summary

Issue Date : 12/31/2023

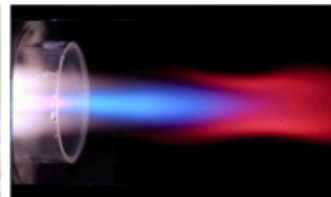
Method Code	Analyte & Method Sample # 231141	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Method Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Method IA Ratio	Average Range (R-bar)	Horwitz %RSD
001.99	Ammoniacal N, Other (%)	11	10	11.36	0.9153	11.68		0.1345	0.0532	1.15%		0.0514	2.76%
002.99	Nitrate N, Other (%)	1		0.0100									
010.60	Total N, Combustion (12%)	11	11	11.65	0.2518	11.63	0.6045	0.2587	0.0975	2.22%	1.00	0.1329	2.76%
010.99	Total N, Other (12%)	2	2	12.04	0.3041								
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	7	7	40.14	0.4771	40.14		0.5410	0.2556	1.35%		0.2952	1.58%
020.40	Total P2O5, Automated (%)	3	3	39.97	0.2163	39.97		0.2163	0.1561	0.54%		0.0900	1.58%
020.50	Total P2O5, ICP (%)	3	3	39.95	0.6016	39.95		0.6016	0.4342	1.51%		0.2149	1.58%
020.99	Total P2O5, Other (%)	2	2	39.78	0.3924								
030.20	Citrate Insoluble P2O5, Spectrophotometric MolybdovanadoP	1		0.3550									
030.40	Citrate Insoluble P2O5, Automated, test portion 963.03 A-B (%)	2	2	0.2988	0.0230								
030.50	Citrate Insoluble P2O5, ICP, test portion 963.03 A-B (%)	1		0.2600									
030.99	Citrate Insoluble P2O5, Other (%)	1		0.3325									
040.20	Indirect Available P2O5, Spectrophotometric (40%)	3	3	26.67	23.09	26.67	0.7333	23.09	16.66	86.59%	73.37	0.0800	1.94%
040.40	Indirect Available P2O5, Automated (40%)	1		39.63									
040.99	Indirect Available P2O5, Other (40%)	2	2	39.64	0.1326								
041.10	Direct Available P2O5, Gravimetric Quinolinium (40%)	3	3	39.86	0.2986	39.86	0.8972	0.2986	0.2155	0.75%	0.78	0.1472	1.58%
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA	4	4	39.50	0.2859	39.50	0.8900	0.2859	0.1787	0.72%	0.75	0.0700	1.59%
041.40	Direct Available P2O5, Automated, Citrate-EDTA Ext. (40%)	1		39.04									
041.51	Direct Available P2O5, ICP, Citrate-EDTA Ext. (40%)	1		39.52									
041.99	Direct Available P2O5, Other (40%)	1		39.59									
048.20	Water Soluble P2O5, Spectrophotometric (%)	1		35.19									
048.40	Water Soluble P2O5, Automated (%)	2	2	35.35	0.0495								
048.99	Water Soluble P2O5, Other (%)	2	2	30.36	0.0071								
050.99	Soluble K2O, Other (%)	2	2	0.1452	0.0068								
060.00	Water (Free), Vacuum Oven (%)	3	3	0.8267	0.5485	0.8267		0.5485	0.3958	66.35%		0.0533	4.12%
060.30	Water (Free), AFPC No. 2B (105°C oven for 2 hours, 5g samp	1		1.543									
101.30	Acid Soluble Ca, ICP, test portion inorganic 965.09 (%)	1		0.4350									
101.33	Acid Soluble Ca, ICP, 2017.02 (%)	2	2	0.3768	0.0063								
101.99	Acid Soluble Ca, Other (%)	1		0.3850									

Method Code	Analyte & Method Sample # 231141	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Method Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Method IA Ratio	Average Range (R-bar)	Howitz %RSD
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	1		0.6060									
121.33	Acid Soluble Mg, ICP, 2017.02 (%)	1		0.6895									
121.99	Acid Soluble Mg, Other (%)	1		0.6150									
131.00	Water Soluble Mg, AA (%)	1		0.1810									
143.99	Elemental S, Other (%)	1		7.547									
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	2	2	7.093	2.167								
145.99	Sulfate S, HCl soluble, Other (%)	1		5.463									
148.00	Total S, Combustion (10%)	4	4	10.19	0.0693	10.19	0.7095	0.0693	0.0433	0.68%	0.23	0.0467	2.82%
148.01	Total S, Gravimetric - sulfate and elemental (10%)	3	3	9.941	0.8118	9.941	0.6970	0.8118	0.5859	8.17%	2.71	0.0822	2.83%
148.07	Total S, ICP, test portion as in 2017.02 (10%)	5	5	9.407	0.8907	9.407	0.6703	0.8907	0.4979	9.47%	3.10	0.2670	2.85%
148.99	Total S, Other (10%)	2	2	8.250	3.755								
151.30	Acid Soluble As, ICP (ppm)	4	4	8.841	1.349	8.841		1.349	0.8433	15.26%		0.3633	11.52%
151.32	Acid Soluble As, ICP, 2006.03 (ppm)	2	2	10.15	1.202								
151.33	Acid Soluble As, ICP, 2017.02 (ppm)	2	2	18.75	13.51								
151.34	Acid Soluble As, ICP, EPA 3050B/6010C (ppm)	1		14.10									
151.99	Acid Soluble As, Other (ppm)	2	2	7.458	2.252								
165.99	Acid Soluble B, Other (%)	2	1	0.0066	0.0048								
181.30	Acid Soluble Cd, ICP (ppm)	4	4	2.660	0.5942	2.660		0.5942	0.3714	22.34%		0.5800	13.81%
181.32	Acid Soluble Cd, ICP, 2006.03 (ppm)	2	2	2.950	0.0707								
181.33	Acid Soluble Cd, ICP, 2017.02 (ppm)	1		3.136									
181.34	Acid Soluble Cd, ICP, EPA 3050B/6010C (ppm)	1		2.100									
181.99	Acid Soluble Cd, Other (ppm)	1		2.800									
191.30	Acid Soluble Cr, ICP (ppm)	5	5	101.3	13.25	101.3		13.25	7.409	13.09%		2.084	7.98%
191.32	Acid Soluble Cr, ICP, 2006.03 (ppm)	2	2	100.4	2.298								
191.33	Acid Soluble Cr, ICP, 2017.02 (ppm)	2	2	112.4	6.886								
191.34	Acid Soluble Cr, ICP, EPA 3050B/6010C (ppm)	1		91.75									
191.99	Acid Soluble Cr, Other (ppm)	2	2	94.51	1.541								
202.30	Acid Soluble Co, ICP (ppm)	3	2	2.897	1.854	1.845	1.5535	0.4879	0.4313	26.44%	0.73	1.000	14.59%
202.32	Acid Soluble Co, ICP, 2006.03 (ppm)	2	2	2.850	0.2121								
202.33	Acid Soluble Co, ICP, 2017.02 (ppm)	2	2	3.149	0.1967								
202.34	Acid Soluble Co, ICP, EPA 3050B/6010C (ppm)	1		2.650									
202.99	Acid Soluble Co, Other (ppm)	2	1	3.775	1.732								
221.00	Acid Soluble Cu, AA, inorganic 965.09 (%)	1		0.0005									
221.30	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)	1		0.0002									
221.32	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)	2	1	0.0002	0.0001								
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	3	3	1.335	2.312	1.335	0.1385	2.312	1.669	173.15%	38.89	0.5351	3.83%
221.99	Acid Soluble Cu, Other (%)	3	2	0.0005	0.0004	0.0003	0.0050	0.0000	0.0000	0.00%	0.00	0.0000	13.56%
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	1		0.8635									
241.33	Acid Soluble Fe, ICP, 2017.02 (%)	2	2	0.9831	0.0083								
241.99	Acid Soluble Fe, Other (%)	1		0.8950									

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251.30	Acid Soluble Pb, ICP (ppm)	5	4	2.619	1.499	2.024		0.7957	0.4973	39.32%		0.6300	14.39%
251.32	Acid Soluble Pb, ICP, 2006.03 (ppm)	2	1	5.200	1.697								
251.33	Acid Soluble Pb, ICP, 2017.02 (ppm)	1		2.928									
251.34	Acid Soluble Pb, ICP, EPA 3050B/6010C (ppm)	1		5.200									
251.99	Acid Soluble Pb, Other (ppm)	2	1	5.550	0.7778								
261.30	Acid Soluble Mn, ICP, test portion 972.02a (%)	1		0.0277									
261.35	Acid Soluble Mn, ICP, 2017.02 (%)	2	2	0.0334	0.0028								
261.99	Acid Soluble Mn, Other (%)	1		0.0262									
281.30	Acid Soluble Hg, ICP (ppm)	4	1	1.775	2.338	0.0334		0.0028	0.0034	8.26%		0.0001	22.00%
281.99	Acid Soluble Hg, Other (ppm)	2	1	0.0285	0.0262								
289.30	Acid Soluble Mo, ICP (ppm)	3	3	12.92	1.776	12.92	4.8750	1.776	1.282	13.75%	0.85	2.450	10.88%
289.32	Acid Soluble Mo, ICP, 2006.03 (ppm)	2	2	11.03	0.6718								
289.33	Acid Soluble Mo, ICP, 2017.02 (ppm)	2	2	11.41	1.841								
289.34	Acid Soluble Mo, ICP, EPA 3050B/6010C (ppm)	1		11.25									
289.99	Acid Soluble Mo, Other (ppm)	1		10.10									
291.30	Acid Soluble Ni, ICP (ppm)	5	5	19.48	6.671	19.48		6.671	3.729	34.24%		0.5080	10.23%
291.32	Acid Soluble Ni, ICP, 2006.03 (ppm)	2	2	16.40	1.556								
291.33	Acid Soluble Ni, ICP, 2017.02 (ppm)	2	2	19.71	1.122								
291.34	Acid Soluble Ni, ICP, EPA 3050B/6010C (ppm)	1		15.00									
291.99	Acid Soluble Ni, Other (ppm)	2	2	14.24	0.7884								
301.30	Acid Soluble Se, ICP (ppm)	2	1	1.263	0.3712								
301.32	Acid Soluble Se, ICP, 2006.03 (ppm)	2	0	5.150	6.859								
301.33	Acid Soluble Se, ICP, 2017.02 (ppm)	2	1	0.3420	0.4695								
301.34	Acid Soluble Se, ICP, EPA 3050B/6010C (ppm)	2	0	0.9500	0.6364								
301.99	Acid Soluble Se, Other (ppm)	2	0	0.2000	0.1414								
311.33	Sodium, ICP, test portion as in 2017.02 (%)	1		0.1999									
311.99	Sodium, Other (%)	1		0.1900									
321.00	Acid Soluble Zn, AA, inorganic 965.09 (1%)	1		0.9900									
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (1%)	3	3	0.9972	0.0265	0.9972	0.1047	0.0265	0.0191	2.65%	0.59	0.0464	4.00%
321.32	Acid Soluble Zn, ICP, test portion 2006.03A-C (1%)	2	2	0.9830	0.0240								
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	8	8	0.9906	0.0604	0.9906	0.1041	0.0685	0.0303	6.92%	1.53	0.0277	4.01%
321.99	Acid Soluble Zn, Other (1%)	2	2	4,650	6,575								
325.00	Water Soluble Zn, AA (%)	1		0.4850									
325.30	Water Soluble Zn, ICP (%)	2	2	0.5600	0.1273								

The Method IA Ratio = 2.33 \* Robust SD / IA at the Method Assigned Value. IA ratios of 1 and less indicate participant data dispersion is as good or less than the IA. Red indicates the IA ratio is significantly greater than 1, Orange indicates marginally greater than 1, Green indicates IA ratio is not significantly greater than 1 and Grey indicates < 6 labs reporting. The Horwitz %RSD is calculated using the Thompson Modification, Analyst,2000,125,385-386.

Horwitz %RSD
Average Range (R-bar)
Method IA Ratio
Robust % RSD
Robust Uncertainty (U)
Robust sd
IA at Method Value
Assigned Value Robust Mean
Raw SD
Raw Mean
# Tests in Robust Calculations
# Tests Submitted
Analyte & Method Sample # 231141
Method Code



Method PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

Sample # 231141

Phosphorous Select PT Scheme

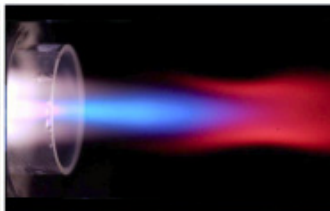
12-40-0 MAP + Zn

### Method Precision Report

Issue Date : 12/31/2023

Method Code	Analyte & Method	# Tests Submitted	# Tests Used in Precision Calcs	Mean	SD	Between Labs sL	Within Labs sr	Reproducibility sR	Between Labs %RSD	Within Labs %rsd	Reproducibility %RSD	sR/sr
001.99	Ammoniacal N, Other (%)	11	9	11.67	0.1811	0.1795	0.0338	0.1827	1.54%	0.29%	1.57%	5.406
010.60	Total N, Combustion (12%)	11	10	11.68	0.2285	0.2183	0.0953	0.2382	1.87%	0.82%	2.04%	2.498
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	7	6	40.04	0.4325	0.4169	0.1624	0.4475	1.04%	0.41%	1.12%	2.755
148.07	Total S, ICP, test portion as in 2017.02 (10%)	5	5	9.407	0.8907	0.8776	0.2148	0.9035	9.33%	2.28%	9.60%	4.207
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	8	8	0.9906	0.0604	0.0578	0.0249	0.0629	5.84%	2.51%	6.35%	2.527

Notes: Precision data calculated when 5 or more Tests included.



Method PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

# Methods: 103

Sample # 231141

Phosphorous Select PT Scheme

# Labs Reporting: 19

12-40-0 MAP + Zn

Lab Values

Issue Date : 12/31/2023

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
001.99	Ammoniacal N, Other (%)	0626	11.21	0.0000	11.68	0.1345	0.0514	10	-3.22	NA	0
001.99	Ammoniacal N, Other (%)	0220	11.22	0.1600	11.68	0.1345	0.0514	10	-3.16	NA	0
001.99	Ammoniacal N, Other (%)	0581	11.66	0.0400	11.68	0.1345	0.0514	10	-0.11	NA	0
001.99	Ammoniacal N, Other (%)	0586	11.67	0.0400	11.68	0.1345	0.0514	10	-0.04	NA	0
001.99	Ammoniacal N, Other (%)	0593	11.68	0.0150	11.68	0.1345	0.0514	10	0.04	NA	0
001.99	Ammoniacal N, Other (%)	0582	11.70	0.0950	11.68	0.1345	0.0514	10	0.15	NA	0
001.99	Ammoniacal N, Other (%)	0405	11.72	0.0200	11.68	0.1345	0.0514	10	0.30	NA	0
001.99	Ammoniacal N, Other (%)	0517	11.78	0.0400	11.68	0.1345	0.0514	10	0.72	NA	0
001.99	Ammoniacal N, Other (%)	0513	11.80	0.0600	11.68	0.1345	0.0514	10	0.85	NA	0
001.99	Ammoniacal N, Other (%)	0096	11.81	0.0500	11.68	0.1345	0.0514	10	0.89	NA	0
001.99	Ammoniacal N, Other (%)	0368	8.671	0.3070	11.68	0.1345	0.0514	10	-20.78	NA	1
002.99	Nitrate N, Other (%)	0220	< 0.01					0			5
010.60	Total N, Combustion (12%)	0494	11.26	0.5600	11.63	0.2587	0.1329	11	-1.36	OK	0
010.60	Total N, Combustion (12%)	0626	11.37	0.0000	11.63	0.2587	0.1329	11	-0.96	OK	0
010.60	Total N, Combustion (12%)	0042	11.40	0.0300	11.63	0.2587	0.1329	11	-0.87	OK	0
010.60	Total N, Combustion (12%)	0368	11.55	0.0160	11.63	0.2587	0.1329	11	-0.31	OK	0
010.60	Total N, Combustion (12%)	0086	11.65	0.1230	11.63	0.2587	0.1329	11	0.05	OK	0
010.60	Total N, Combustion (12%)	0527	11.68	0.0300	11.63	0.2587	0.1329	11	0.16	OK	0
010.60	Total N, Combustion (12%)	0561	11.69	0.0400	11.63	0.2587	0.1329	11	0.20	OK	0
010.60	Total N, Combustion (12%)	0405	11.72	0.0000	11.63	0.2587	0.1329	11	0.31	OK	0
010.60	Total N, Combustion (12%)	0220	11.76	0.0100	11.63	0.2587	0.1329	11	0.43	OK	0
010.60	Total N, Combustion (12%)	0593	11.90	0.2700	11.63	0.2587	0.1329	11	0.94	OK	0
010.60	Total N, Combustion (12%)	0040	12.15	0.3000	11.63	0.2587	0.1329	11	1.86	OK	0
010.99	Total N, Other (12%)	0517	11.83	0.0500				2			0
010.99	Total N, Other (12%)	0627	12.26	0.0900				2			0
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	0405	39.60	0.0000	40.14	0.5410	0.2952	7	-0.91	NA	0
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	0593	39.88	0.3850	40.14	0.5410	0.2952	7	-0.44	NA	0
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	0561	39.95	0.0900	40.14	0.5410	0.2952	7	-0.33	NA	0
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	0581	39.96	0.1600	40.14	0.5410	0.2952	7	-0.30	NA	0
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	0582	39.99	0.3500	40.14	0.5410	0.2952	7	-0.25	NA	0
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	0615	40.75	0.9000	40.14	0.5410	0.2952	7	1.02	NA	0

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	0220	40.88	0.1100	40.14	0.5410	0.2952	7	1.22	NA	0
020.40	Total P2O5, Automated (%)	0586	39.79	0.1100	39.97	0.2163	0.0900	3	-0.83		0
020.40	Total P2O5, Automated (%)	0096	39.91	0.1500	39.97	0.2163	0.0900	3	-0.28		0
020.40	Total P2O5, Automated (%)	0626	40.21	0.0100	39.97	0.2163	0.0900	3	1.11		0
020.50	Total P2O5, ICP (%)	0368	39.28	0.0340	39.95	0.6016	0.2149	3	-1.10		0
020.50	Total P2O5, ICP (%)	0627	40.10	0.1200	39.95	0.6016	0.2149	3	0.26		0
020.50	Total P2O5, ICP (%)	0527	40.46	0.4906	39.95	0.6016	0.2149	3	0.85		0
020.99	Total P2O5, Other (%)	0513	39.50	0.0200				2			0
020.99	Total P2O5, Other (%)	0517	40.06	0.0900				2			0
030.20	Citrate Insoluble P2O5, Spectrophotometric MolybdovanadoP (%)	0220	0.3550	0.0300				1			0
030.40	Citrate Insoluble P2O5, Automated, test portion 963.03 A-B (%)	0096	0.2825	0.0550				2			0
030.40	Citrate Insoluble P2O5, Automated, test portion 963.03 A-B (%)	0586	0.3150	0.1100				2			0
030.50	Citrate Insoluble P2O5, ICP, test portion 963.03 A-B (%)	0582	0.2600	0.0800				1			0
030.99	Citrate Insoluble P2O5, Other (%)	0593	0.3325	0.0050				1			0
040.20	Indirect Available P2O5, Spectrophotometric (40%)	0405	0.0100	0.0000	26.67	23.09	0.0800	3	-1.15		0
040.20	Indirect Available P2O5, Spectrophotometric (40%)	0586	39.47	0.0000	26.67	23.09	0.0800	3	0.55		0
040.20	Indirect Available P2O5, Spectrophotometric (40%)	0220	40.52	0.0800	26.67	23.09	0.0800	3	0.60		0
040.40	Indirect Available P2O5, Automated (40%)	0096	39.63	0.0900				1			0
040.99	Indirect Available P2O5, Other (40%)	0593	39.55	0.3900				2			0
040.99	Indirect Available P2O5, Other (40%)	0582	39.73	0.4250				2			0
041.10	Direct Available P2O5, Gravimetric Quinolinium (40%)	0040	39.55	0.3000	39.86	0.2986	0.1472	3	-1.05		0
041.10	Direct Available P2O5, Gravimetric Quinolinium (40%)	0086	39.89	0.0116	39.86	0.2986	0.1472	3	0.10		0
041.10	Direct Available P2O5, Gravimetric Quinolinium (40%)	0494	40.15	0.1300	39.86	0.2986	0.1472	3	0.95		0
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA I	0405	39.27	0.0200	39.50	0.2859	0.0700	4	-0.80		0
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA I	0513	39.32	0.0800	39.50	0.2859	0.0700	4	-0.62		0
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA I	0220	39.50	0.0200	39.50	0.2859	0.0700	4	0.01		0
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA I	0517	39.90	0.1600	39.50	0.2859	0.0700	4	1.41		0
041.40	Direct Available P2O5, Automated, Citrate-EDTA Ext. (40%)	0626	39.04	0.0200				1			0
041.51	Direct Available P2O5, ICP, Citrate-EDTA Ext. (40%)	0494	39.52	0.2300				1			0
041.99	Direct Available P2O5, Other (40%)	0405	39.59	0.0100				1			0
048.20	Water Soluble P2O5, Spectrophotometric (%)	0593	35.19	0.2950				1			0
048.40	Water Soluble P2O5, Automated (%)	0096	35.31	0.0200				2			0
048.40	Water Soluble P2O5, Automated (%)	0626	35.38	0.0200				2			0
048.99	Water Soluble P2O5, Other (%)	0517	30.35	0.1400				2			0
048.99	Water Soluble P2O5, Other (%)	0513	30.36	0.1400				2			0
050.99	Soluble K2O, Other (%)	0527	0.1404	0.0025				2			0
050.99	Soluble K2O, Other (%)	0096	0.1500	0.0000				2			0
060.00	Water (Free), Vacuum Oven (%)	0513	0.5100	0.0200	0.8267	0.5485	0.0533	3	-0.58		0
060.00	Water (Free), Vacuum Oven (%)	0517	0.5100	0.0200	0.8267	0.5485	0.0533	3	-0.58		0
060.00	Water (Free), Vacuum Oven (%)	0096	1.460	0.1200	0.8267	0.5485	0.0533	3	1.15		0
060.30	Water (Free), AFPC No. 2B (105°C oven for 2 hours, 5g sample)	0593	1.543	0.1550				1			0
101.30	Acid Soluble Ca, ICP, test portion inorganic 965.09 (%)	0096	0.4350	0.1100				1			0
101.33	Acid Soluble Ca, ICP, 2017.02 (%)	0527	0.3724	0.0275				2			0

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
101.33	Acid Soluble Ca, ICP, 2017.02 (%)	0494	0.3813	0.0071				2			0
101.99	Acid Soluble Ca, Other (%)	0593	0.3850	0.0100				1			0
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	0096	0.6060	0.0060				1			0
121.33	Acid Soluble Mg, ICP, 2017.02 (%)	0527	0.6895	0.0300				1			0
121.99	Acid Soluble Mg, Other (%)	0593	0.6150	0.0100				1			0
131.00	Water Soluble Mg, AA (%)	0626	0.1810	0.0020				1			0
143.99	Elemental S, Other (%)	0368	7.547	0.4354				1			0
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	0561	5.560	0.0200				2			0
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	0220	8.625	0.0100				2			0
145.99	Sulfate S, HCl soluble, Other (%)	0593	5.463	0.1850				1			0
148.00	Total S, Combustion (10%)	0626	10.09	0.0200	10.19	0.0693	0.0467	4	-1.44		0
148.00	Total S, Combustion (10%)	0581	10.21	0.0200	10.19	0.0693	0.0467	4	0.29		0
148.00	Total S, Combustion (10%)	0593	10.21	0.0000	10.19	0.0693	0.0467	4	0.29		0
148.00	Total S, Combustion (10%)	0405	10.25	0.1000	10.19	0.0693	0.0467	4	0.87		0
148.01	Total S, Gravimetric - sulfate and elemental (10%)	0405	9.035	0.0300	9.941	0.8118	0.0822	3	-1.12		0
148.01	Total S, Gravimetric - sulfate and elemental (10%)	0561	10.19	0.0100	9.941	0.8118	0.0822	3	0.30		0
148.01	Total S, Gravimetric - sulfate and elemental (10%)	0494	10.60	0.2065	9.941	0.8118	0.0822	3	0.82		0
148.07	Total S, ICP, test portion as in 2017.02 (10%)	0627	8.075	0.0500	9.407	0.8907	0.2670	5	-1.50		0
148.07	Total S, ICP, test portion as in 2017.02 (10%)	0527	8.940	0.1848	9.407	0.8907	0.2670	5	-0.52		0
148.07	Total S, ICP, test portion as in 2017.02 (10%)	0040	9.800	0.0000	9.407	0.8907	0.2670	5	0.44		0
148.07	Total S, ICP, test portion as in 2017.02 (10%)	0513	9.970	0.2200	9.407	0.8907	0.2670	5	0.63		0
148.07	Total S, ICP, test portion as in 2017.02 (10%)	0494	10.25	0.6133	9.407	0.8907	0.2670	5	0.95		0
148.99	Total S, Other (10%)	0096	5.595	0.2700				2			0
148.99	Total S, Other (10%)	0220	10.91	0.0500				2			0
151.30	Acid Soluble As, ICP (ppm)	0096	7.900	0.6000	8.841	1.349	0.3633	4	-0.70		0
151.30	Acid Soluble As, ICP (ppm)	0586	8.000	0.0000	8.841	1.349	0.3633	4	-0.62		0
151.30	Acid Soluble As, ICP (ppm)	0627	8.665	0.2900	8.841	1.349	0.3633	4	-0.13		0
151.30	Acid Soluble As, ICP (ppm)	0593	10.80	0.2000	8.841	1.349	0.3633	4	1.45		0
151.32	Acid Soluble As, ICP, 2006.03 (ppm)	0220	9.300	0.2000				2			0
151.32	Acid Soluble As, ICP, 2006.03 (ppm)	0405	11.00	0.0000				2			0
151.33	Acid Soluble As, ICP, 2017.02 (ppm)	0527	9.197	0.4796				2			0
151.33	Acid Soluble As, ICP, 2017.02 (ppm)	0494	28.30	2.800				2			0
151.34	Acid Soluble As, ICP, EPA 3050B/6010C (ppm)	0368	14.10	0.0000				1			0
151.99	Acid Soluble As, Other (ppm)	0626	5.865	0.1700				2			0
151.99	Acid Soluble As, Other (ppm)	0220	9.050	0.1000				2			0
165.99	Acid Soluble B, Other (%)	0593	0.0032	0.0001				1			0
165.99	Acid Soluble B, Other (%)	0527	< 0.01					1			5
181.30	Acid Soluble Cd, ICP (ppm)	0586	2.000	2.000	2.660	0.5942	0.5800	4	-1.11		0
181.30	Acid Soluble Cd, ICP (ppm)	0626	2.415	0.2300	2.660	0.5942	0.5800	4	-0.41		0
181.30	Acid Soluble Cd, ICP (ppm)	0593	2.835	0.0500	2.660	0.5942	0.5800	4	0.29		0
181.30	Acid Soluble Cd, ICP (ppm)	0627	3.390	0.0400	2.660	0.5942	0.5800	4	1.23		0
181.32	Acid Soluble Cd, ICP, 2006.03 (ppm)	0220	2.900	0.0000				2			0
181.32	Acid Soluble Cd, ICP, 2006.03 (ppm)	0405	3.000	0.0000				2			0



Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
181.33	Acid Soluble Cd, ICP, 2017.02 (ppm)	0527	3.136	0.2082				1			0
181.34	Acid Soluble Cd, ICP, EPA 3050B/6010C (ppm)	0368	2.100	0.0000				1			0
181.99	Acid Soluble Cd, Other (ppm)	0220	2.800	0.0000				1			0
191.30	Acid Soluble Cr, ICP (ppm)	0627	90.90	0.4000	101.3	13.25	2.084	5	-0.78		0
191.30	Acid Soluble Cr, ICP (ppm)	0626	92.86	0.7200	101.3	13.25	2.084	5	-0.64		0
191.30	Acid Soluble Cr, ICP (ppm)	0096	99.05	0.5000	101.3	13.25	2.084	5	-0.17		0
191.30	Acid Soluble Cr, ICP (ppm)	0593	99.60	0.8000	101.3	13.25	2.084	5	-0.13		0
191.30	Acid Soluble Cr, ICP (ppm)	0586	124.0	8.000	101.3	13.25	2.084	5	1.71		0
191.32	Acid Soluble Cr, ICP, 2006.03 (ppm)	0220	98.75	1.900				2			0
191.32	Acid Soluble Cr, ICP, 2006.03 (ppm)	0405	102.0	0.0000				2			0
191.33	Acid Soluble Cr, ICP, 2017.02 (ppm)	0494	107.5	13.00				2			0
191.33	Acid Soluble Cr, ICP, 2017.02 (ppm)	0527	117.2	1.097				2			0
191.34	Acid Soluble Cr, ICP, EPA 3050B/6010C (ppm)	0368	91.75	0.1000				1			0
191.99	Acid Soluble Cr, Other (ppm)	0626	93.42	1.460				2			0
191.99	Acid Soluble Cr, Other (ppm)	0220	95.60	0.4000				2			0
202.30	Acid Soluble Co, ICP (ppm)	0586	1.500	1.000				2			0
202.30	Acid Soluble Co, ICP (ppm)	0593	2.190	0.0000				2			0
202.30	Acid Soluble Co, ICP (ppm)	0626	< 5					2			5
202.32	Acid Soluble Co, ICP, 2006.03 (ppm)	0220	2.700	0.0000				2			0
202.32	Acid Soluble Co, ICP, 2006.03 (ppm)	0405	3.000	0.0000				2			0
202.33	Acid Soluble Co, ICP, 2017.02 (ppm)	0494	3.010	0.1000				2			0
202.33	Acid Soluble Co, ICP, 2017.02 (ppm)	0527	3.288	0.1446				2			0
202.34	Acid Soluble Co, ICP, EPA 3050B/6010C (ppm)	0368	2.650	0.1000				1			0
202.99	Acid Soluble Co, Other (ppm)	0220	2.550	0.1000				1			0
202.99	Acid Soluble Co, Other (ppm)	0626	< 5					1			5
221.00	Acid Soluble Cu, AA, inorganic 965.09 (%)	0626	0.0005	0.0001				1			0
221.30	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)	0096	0.0002	0.0000				1			0
221.32	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)	0220	0.0001	0.0000				1			0
221.32	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)	0405	< 0.0002					1			5
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	0527	0.0004	0.0001	1.335	2.312	0.5351	3	-0.58		0
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	0626	0.0005	0.0000	1.335	2.312	0.5351	3	-0.58		0
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	0627	4.005	1.070	1.335	2.312	0.5351	3	1.15		0
221.99	Acid Soluble Cu, Other (%)	0368	0.0003	0.0000				2			0
221.99	Acid Soluble Cu, Other (%)	0593	0.0003	0.0000				2			0
221.99	Acid Soluble Cu, Other (%)	0586	< 0.001					2			5
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	0096	0.8635	0.0070				1			0
241.33	Acid Soluble Fe, ICP, 2017.02 (%)	0527	0.9772	0.0057				2			0
241.33	Acid Soluble Fe, ICP, 2017.02 (%)	0494	0.9890	0.0203				2			0
241.99	Acid Soluble Fe, Other (%)	0593	0.8950	0.0100				1			0
251.30	Acid Soluble Pb, ICP (ppm)	0586	1.000	0.0000	2.024	0.7957	0.6300	4	-1.29		0
251.30	Acid Soluble Pb, ICP (ppm)	0096	1.800	0.2000	2.024	0.7957	0.6300	4	-0.28		0
251.30	Acid Soluble Pb, ICP (ppm)	0627	2.540	1.680	2.024	0.7957	0.6300	4	0.65		0
251.30	Acid Soluble Pb, ICP (ppm)	0593	2.755	0.0100	2.024	0.7957	0.6300	4	0.92		0

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
251.30	Acid Soluble Pb, ICP (ppm)	0626	< 5		2.024	0.7957	0.6300	4			5
251.32	Acid Soluble Pb, ICP, 2006.03 (ppm)	0220	6.400	0.4000				1			0
251.32	Acid Soluble Pb, ICP, 2006.03 (ppm)	0405	< 4					1			5
251.33	Acid Soluble Pb, ICP, 2017.02 (ppm)	0527	2.928	0.1348				1			0
251.34	Acid Soluble Pb, ICP, EPA 3050B/6010C (ppm)	0368	5.200	0.2000				1			0
251.99	Acid Soluble Pb, Other (ppm)	0220	6.100	0.2000				1			0
251.99	Acid Soluble Pb, Other (ppm)	0626	< 5					1			5
261.30	Acid Soluble Mn, ICP, test portion 972.02a (%)	0096	0.0277	0.0001				1			0
261.35	Acid Soluble Mn, ICP, 2017.02 (%)	0527	0.0315	0.0001				2			0
261.35	Acid Soluble Mn, ICP, 2017.02 (%)	0494	0.0354	0.0027				2			0
261.99	Acid Soluble Mn, Other (%)	0593	0.0262	0.0003				1			0
281.30	Acid Soluble Hg, ICP (ppm)	0593	0.1000	0.0000				1			0
281.30	Acid Soluble Hg, ICP (ppm)	0527	< 0.001					1			5
281.30	Acid Soluble Hg, ICP (ppm)	0405	< 2					1			5
281.30	Acid Soluble Hg, ICP (ppm)	0627	< 5					1			5
281.99	Acid Soluble Hg, Other (ppm)	0626	0.0470	0.0000				1			0
281.99	Acid Soluble Hg, Other (ppm)	0220	< 0.01					1			5
289.30	Acid Soluble Mo, ICP (ppm)	0096	10.90	3.400	12.92	1.776	2.450	3	-1.14		0
289.30	Acid Soluble Mo, ICP (ppm)	0593	13.60	0.0000	12.92	1.776	2.450	3	0.38		0
289.30	Acid Soluble Mo, ICP (ppm)	0586	14.25	1.500	12.92	1.776	2.450	3	0.75		0
289.32	Acid Soluble Mo, ICP, 2006.03 (ppm)	0220	10.55	0.1000				2			0
289.32	Acid Soluble Mo, ICP, 2006.03 (ppm)	0405	11.50	1.000				2			0
289.33	Acid Soluble Mo, ICP, 2017.02 (ppm)	0494	10.11	0.3800				2			0
289.33	Acid Soluble Mo, ICP, 2017.02 (ppm)	0527	12.71	0.4278				2			0
289.34	Acid Soluble Mo, ICP, EPA 3050B/6010C (ppm)	0368	11.25	0.1000				1			0
289.99	Acid Soluble Mo, Other (ppm)	0220	10.10	0.0000				1			0
291.30	Acid Soluble Ni, ICP (ppm)	0626	13.03	0.2500	19.48	6.671	0.5080	5	-0.97		0
291.30	Acid Soluble Ni, ICP (ppm)	0593	14.72	0.0400	19.48	6.671	0.5080	5	-0.71		0
291.30	Acid Soluble Ni, ICP (ppm)	0096	16.50	0.2000	19.48	6.671	0.5080	5	-0.45		0
291.30	Acid Soluble Ni, ICP (ppm)	0627	25.16	0.0500	19.48	6.671	0.5080	5	0.85		0
291.30	Acid Soluble Ni, ICP (ppm)	0586	28.00	2.000	19.48	6.671	0.5080	5	1.28		0
291.32	Acid Soluble Ni, ICP, 2006.03 (ppm)	0220	15.30	0.2000				2			0
291.32	Acid Soluble Ni, ICP, 2006.03 (ppm)	0405	17.50	1.000				2			0
291.33	Acid Soluble Ni, ICP, 2017.02 (ppm)	0527	18.91	0.1181				2			0
291.33	Acid Soluble Ni, ICP, 2017.02 (ppm)	0494	20.50	2.800				2			0
291.34	Acid Soluble Ni, ICP, EPA 3050B/6010C (ppm)	0368	15.00	0.2000				1			0
291.99	Acid Soluble Ni, Other (ppm)	0626	13.69	0.2100				2			0
291.99	Acid Soluble Ni, Other (ppm)	0220	14.80	0.0000				2			0
301.30	Acid Soluble Se, ICP (ppm)	0593	1.525	0.0500				1			0
301.30	Acid Soluble Se, ICP (ppm)	0627	< 1					1			5
301.32	Acid Soluble Se, ICP, 2006.03 (ppm)	0220	< 0.3					0			5
301.32	Acid Soluble Se, ICP, 2006.03 (ppm)	0405	< 10					0			5
301.33	Acid Soluble Se, ICP, 2017.02 (ppm)	0494	0.6740	0.0080				1			0

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
301.33	Acid Soluble Se, ICP, 2017.02 (ppm)	0527	< 0.01					1			5
301.34	Acid Soluble Se, ICP, EPA 3050B/6010C (ppm)	0626	< 0.5					0			5
301.34	Acid Soluble Se, ICP, EPA 3050B/6010C (ppm)	0368	< 1.4					0			5
301.99	Acid Soluble Se, Other (ppm)	0586	< 0.1					0			5
301.99	Acid Soluble Se, Other (ppm)	0220	< 0.3					0			5
311.33	Sodium, ICP, test portion as in 2017.02 (%)	0527	0.1999	0.0008				1			0
311.99	Sodium, Other (%)	0096	0.1900	0.0000				1			0
321.00	Acid Soluble Zn, AA, inorganic 965.09 (1%)	0626	0.9900	0.0400				1			0
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (1%)	0513	0.9750	0.0100	0.9972	0.0265	0.0464	3	-0.84		0
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (1%)	0581	0.9900	0.0200	0.9972	0.0265	0.0464	3	-0.27		0
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (1%)	0096	1.026	0.1091	0.9972	0.0265	0.0464	3	1.11		0
321.32	Acid Soluble Zn, ICP, test portion 2006.03A-C (1%)	0405	0.9660	0.0040				2			0
321.32	Acid Soluble Zn, ICP, test portion 2006.03A-C (1%)	0220	1.000	0.0000				2			0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0627	0.9250	0.0100	0.9906	0.0685	0.0277	8	-0.88	OK	0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0040	0.9315	0.0110	0.9906	0.0685	0.0277	8	-0.79	OK	0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0626	0.9550	0.0700	0.9906	0.0685	0.0277	8	-0.48	OK	0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0561	0.9750	0.0300	0.9906	0.0685	0.0277	8	-0.21	OK	0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0593	0.9825	0.0350	0.9906	0.0685	0.0277	8	-0.11	OK	0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0582	0.9950	0.0300	0.9906	0.0685	0.0277	8	0.06	OK	0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0494	1.079	0.0418	0.9906	0.0685	0.0277	8	1.18	OK	0
321.33	Acid Soluble Zn, ICP, 2017.02 (1%)	0527	1.082	0.0056	0.9906	0.0685	0.0277	8	1.22	OK	0
321.99	Acid Soluble Zn, Other (1%)	0368	0.9872	0.0021				2			0
321.99	Acid Soluble Zn, Other (1%)	0586	9,300	200.0				2			0
325.00	Water Soluble Zn, AA (%)	0626	0.4850	0.0100				1			0
325.30	Water Soluble Zn, ICP (%)	0626	0.4700	0.0000				2			0
325.30	Water Soluble Zn, ICP (%)	0513	0.6500	0.0200				2			0

### Interpreting Z Scores and Flags:

Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). Flags indicate data usage: 0 = Used, 1 = rejected for duplicates too far apart, 2 = rejected as extreme outlier, 3 = removed from stats, 4 = rejected due to 0s submitted and 5 = LOD. A 9 flag indicates a data problem - scores not calculated.

### Notes:

\*Robust statistics not used if < 6 labs used in calculations, in this case Values and Z Scores are grayed out and should be interpreted with extreme caution. Identical duplicates not included in calculation of Rob R-bar. IA Status describes where your result is relative to the Assigned Value ± IA. Red indicates Higher or Lower and Green indicates within the IA range about the Robust mean. Method codes in light green indicate a guaranteed analyte. Individual lab values may be below detection limits but are reported solely for