



Magruder Fertilizer Proficiency Testing

METHOD Summary Statistics

251215 (Potash)



Issue Date: 1/31/2026

Code	Analyte / Method (Guarantees in green)	¹ Trueness (Lab Value)					² Thompson Horwitz ² IA ratio		³ Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD	Thompson Horwitz %RSD	IA ratio	Robust Mean	n used
001.99	Ammoniacal N/Other (%)	3.164	2		4.407				0.16	1
005.99	Urea N/Other (%)	30.53	2		42.83				0.386	2
010.60	Total N/Combustion (%)	4.02	4	4.969	7.95	198	3.24			
010.99	Total N/Other (%)	0.052	1						0.0155	1
010.12	Total N/Salicylic (%)	0.0082	1							
020.50	Total P2O5/ICP (%)	0.0204	4	0.0093	0.0148	72.6	7.15		0.0108	3
041.51	Direct Available P2O5/ICP, Citrate-EDTA Ext. (%)	37.77	2		30.67				0.535	2
041.21	Direct Available P2O5/Spectrophotometric, Citrate-EDT	0.0105	1						0.001	1
050.99	Soluble K2O, Other (60%)	60.29	32	0.3232	1.463	2.43	1.29	1.91	0.5156	31
050.52	Soluble K2O, ICP (Citrate-EDTA) (60%)	60.58	11	0.413	1.096	1.81	1.28	1.43	1.204	10
050.00	Soluble K2O, STPB Oxalate (60%)	60.8	9	0.1496	0.3591	0.59	1.28	0.47	0.16	8
050.50	Soluble K2O, ICP (Oxalate) (60%)	60.05	8	0.2832	0.6408	1.07	1.29	0.84	0.9813	8

Code	Analyte / Method (Guarantees in green)	¹ Trueness (Lab Value)					² Thompson Horwitz ² IA ratio		³ Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD	Thompson Horwitz %RSD	IA ratio	Robust Mean	n used
050.51	Soluble K ₂ O, ICP (Citrate) (60%)	60.95	4	0.5206	0.8329	1.37	1.28	1.08	0.2345	3
050.62	Soluble K ₂ O, Flame Photometric (Citrate-EDTA) (60%)	61.93	3	0.8179	1.133	1.83	1.27	1.47	1.1	3
050.30	Soluble K ₂ O, AA (Oxalate) (60%)	62.67	2		2.238				0.315	2
050.32	Soluble K ₂ O, AA (Citrate-EDTA) (60%)	55.43	2		6.753				4.02	2
050.60	Soluble K ₂ O, Flame Photometric (Oxalate) (60%)	60.65	2		0.5303				0.22	2
050.61	Soluble K ₂ O, Flame Photometric (Citrate) (60%)	61.15	1						0.1	1
060.00	Water (Free)/Vacuum Oven (%)	0.4425	2		0.0177				0.045	2
060.20	Water (Free)/Karl Fischer (%)	0.2578	2		0.1305				0.003	1
060.30	Water (Free)/AFPC No. 2B (105°C oven for 2 hours, 5g s	0.1012	2		0.0018				0.003	1
060.99	Water (Free)/Other (%)	0.179	2		0.1287					
101.30	Acid Soluble Ca/ICP, test portion inorganic 965.09 (%)	0.1118	2		0.0469				0.01	1
101.33	Acid Soluble Ca/ICP, 2017.02 (%)	0.08	1							
121.33	Acid Soluble Mg/ICP, 2017.02 (%)	0.0558	3	0.0044	0.0061	11	6.15		0.0058	3
121.30	Acid Soluble Mg/ICP, test portion inorganic 965.09 (%)	0.0619	2		0.0044				0.01	1
121.99	Acid Soluble Mg/Other (%)	0.0513	1						0.0052	1
148.99	Total S/Other (%)	0.029	2		0.0085				0.006	2
148.07	Total S/ICP, test portion as in 2017.02 (%)	0.025	1						0.01	1
149.04	S - HNO ₃ soluble/ICP (%)	0.0256	1						0.0009	1
151.30	Acid Soluble As/ICP (ppm)	0.0952	2		0.0599				0.02425	2

Code	Analyte / Method (Guarantees in green)	¹ Trueness (Lab Value)					² Thompson Horwitz %RSD	² IA ratio	³ Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD			Robust Mean	n used
151.32	Acid Soluble As/ICP, 2006.03 (ppm)	1.98	1						0.66	1
165.99	Acid Soluble B/Other (%)	0.0001	1							
181.30	Acid Soluble Cd/ICP (ppm)	0.0204	2		0.0022				0.0029	2
181.34	Acid Soluble Cd/ICP, EPA 3050B/6010C (ppm)	0.25	1						0.1	1
181.99	Acid Soluble Cd/Other (ppm)	0.17	1							
190.00	Water Soluble Cl/Titrimetric (%)	46.74	11	0.6365	1.689	3.61	1.46		0.1788	11
190.99	Water Soluble Cl/Other (%)	46.72	4	0.5336	0.8537	1.83	1.46		0.7314	4
191.30	Acid Soluble Cr/ICP (ppm)	0.7922	4	0.4381	0.701	88.5	16.4		0.0739	4
191.34	Acid Soluble Cr/ICP, EPA 3050B/6010C (ppm)	4.262	2		5.18				5.95	1
191.32	Acid Soluble Cr/ICP, 2006.03 (ppm)	0.415	1						0.03	1
191.99	Acid Soluble Cr/Other (ppm)	0.43	1							
202.30	Acid Soluble Co/ICP (ppm)	0.1992	2		0.1326				0.0103	2
202.99	Acid Soluble Co/Other (ppm)	2.37	1						0.871	1
221.99	Acid Soluble Cu/Other (%)	0.0013	2		0.001				0.0001	1
241.33	Acid Soluble Fe/ICP, 2017.02 (%)	0.0125	3	0.0016	0.0022	17.3	7.7			
241.30	Acid Soluble Fe/ICP, test portion inorganic 965.09 (%)	0.02	1						0.02	1
241.99	Acid Soluble Fe/Other (%)	0.0128	1						0.0003	1
251.32	Acid Soluble Pb/ICP, 2006.03 (ppm)	0.412	2		0.0028				0.045	2
251.99	Acid Soluble Pb/Other (ppm)	0.2725	2		0.145				0.015	2

Code	Analyte / Method (Guarantees in green)	¹ Trueness (Lab Value)					² Thompson Horwitz ² IA ratio		³ Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD	Thompson Horwitz %RSD	IA ratio	Robust Mean	n used
251.30	Acid Soluble Pb/ICP (ppm)	0.1958	2		0.0739				0.0134	2
251.34	Acid Soluble Pb/ICP, EPA 3050B/6010C (ppm)	3.75	1						0.1	1
261.99	Acid Soluble Mn/Other (%)	0.0001	1							
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	4.117	2		0.754				2.0935	2
289.30	Acid Soluble Mo/ICP (ppm)	0.1025	2		0.1308				0.0566	1
291.30	Acid Soluble Ni/ICP (ppm)	0.2592	3	0.0161	0.0223	8.61	19.4		0.0149	3
291.99	Acid Soluble Ni/Other (ppm)	1.681	2		2.002				0.2855	2
291.32	Acid Soluble Ni/ICP, 2006.03 (ppm)	0.2368	2		0.0612				0.0305	2
301.30	Acid Soluble Se/ICP (ppm)	0.1879	2		0.0871				0.03985	2
311.99	Sodium/Other (%)	1.051	5	0.0335	0.06	5.71	3.96		0.032	4
311.30	Sodium/Flame Photometric (%)	1.55	4	0.3307	0.5291	34.1	3.74		0.1143	3
311.33	Sodium/ICP, test portion as in 2017.02 (%)	1.094	4	0.0165	0.0265	2.42	3.94		0.0511	3
311.32	Sodium/ICP, 2006.03 test portion (%)	1.1	1						0.06	1
321.32	Acid Soluble Zn/ICP, test portion 2006.03A-C (%)	0.0044	2		0.0059				0.00015	2
321.99	Acid Soluble Zn/Other (%)	0.0014	2		0.0016				0.0006	2
321.00	Acid Soluble Zn/AA, inorganic 965.09 (%)	0.0006	1						0.0006	1
321.30	Acid Soluble Zn/ICP, test portion inorganic 965.09 (%)	0.002	1							

1. Parameters evaluating Trueness of Lab Value: Trueness measures how close a Lab Value is to the mean. Parameters are shown for number of observations used (n used). Method All Tests report identifies data not used. Robust statistics was employed to determine mean and standard deviation (StDev) if number of observations used (n used) >=6 (blue background). Classical statistics was employed if number of observations used (n used) < 6 (no color background). %RSD is the relative standard deviation with respect to the mean (StDev/Mean x 100). Uncertainty (Uncert.) is a measure of where the true population mean lies.

2. Thompson-Horwitz %RSD and IA ratio: These values are benchmarks that can be used to evaluate the variability of a population of data in the round. Thompson-Horwitz %RSD is a standard benchmark on variability from proficiency testing programs. IA ratio variability of the data set divided by variability expected from AAPFCO investigational allowance. IA ratios greater than 1 indicate population variability is greater than that expected from the IA.

3. Parameters evaluating Precision of Lab Range: Lab's precision is estimated by the difference in 2 results reported by the lab (range). Mean of ranges are shown for number of observations used (n used). Method All Tests report identifies data not used. Robust statistics was employed to determine mean if number of observations used (n used) ≥ 6 (green background). Classical statistics was employed if number of observations used (n used) < 6 (no color background).

Appendix

Content Description of Method Summary Statistics Report

Data collected from all the labs provides an estimate of trueness and precision for determination of analyte by specific methods on the Method Summary Statistics report. Determination of summary statistics followed protocols in ISO 13528:2015(E) (Statistical methods for use in proficiency testing by interlaboratory comparison). Robust statistics was used to determine statistical parameters for sets with 6 or more observations. Classical statistics was used for sets with 3, 4, or 5 observations. Robust statistics has an advantage of removing undesired influence of outlying data on the mean and standard deviation without removing data from the statistical analysis.

For trueness, the mean and standard deviation (StDev) are presented for the number of observations used in a set of data. The uncertainty (Uncert.) is a measure of where the “real” value for the concentration lies around the mean with a 68% certainty ($\text{Mean} \pm \text{Uncert.}$). The larger the number of observations, the smaller the uncertainty. The relative standard deviation (%RSD) is a percentage of the standard deviation divided by the mean. The Thompson-Horwitz %RSD is a standard benchmark on inter-laboratory variability (Thompson, DOI: 10.1039/b000282h) that can be used to compare variability with Thompson-Horwitz expectation. The IA ratio is a measure of how disperse the data is in a set of data compared to dispersion expected by the AAPFCO investigational allowance (IA). The ratio is data dispersion in the data set divided by IA calculated data dispersion. Values greater than 1 indicate data dispersion was greater than IA dispersion.

Precision in the data populations is estimated by the range of duplicate results reported. The robust or classical mean is presented along with the number of observations used. Any duplicate results that are exactly the same are removed in the determination of the mean range to remove undue influence of entries from labs reporting one result twice.



Magruder Fertilizer Proficiency Testing

METHOD All Tests Report

251215 (Potash)



Issue Date: 1/31/2026

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
	Ammoniacal N/Other (%)									
001.99	Ammoniacal N/Other (%)	0524	0.048	0.048	0.048					7
001.99	Ammoniacal N/Other (%)	0423	6.36	6.2	6.28					
	Urea N/Other (%)									
005.99	Urea N/Other (%)	0524	0.24	0.242	0.241					
005.99	Urea N/Other (%)	0638	60.43	61.2	60.82					
	Total N/Salicylic (%)									
010.12	Total N/Salicylic (%)	0568	0.0082	0.0082	0.0082					7
	Total N/Combustion (%)									
010.60	Total N/Combustion (%)	0422	0.01	0.01	0.01	-0.50	4.02	7.95	4	7
010.60	Total N/Combustion (%)	0588	0.057	0.039	0.048	-0.50	4.02	7.95	4	
010.60	Total N/Combustion (%)	0354	0.077	0.077	0.077	-0.50	4.02	7.95	4	7
010.60	Total N/Combustion (%)	0423	15.93	15.96	15.94	1.50	4.02	7.95	4	2

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
	Total N/Other (%)									
010.99	Total N/Other (%)	0524	0.0443	0.0598	0.052					
	Total P2O5/ICP (%)									
020.50	Total P2O5/ICP (%)	0527	<0.01	<0.01	<0.01		0.0204	0.0148	4	6
020.50	Total P2O5/ICP (%)	0524	0.0025	0.0029	0.0027	-1.20	0.0204	0.0148	4	
020.50	Total P2O5/ICP (%)	0422	0.013	0.015	0.014	-0.43	0.0204	0.0148	4	
020.50	Total P2O5/ICP (%)	0472	0.03	0.03	0.03	0.65	0.0204	0.0148	4	7
020.50	Total P2O5/ICP (%)	0588	0.02	0.05	0.035	0.98	0.0204	0.0148	4	
020.50	Total P2O5/ICP (%)	0523	59.487	59.41	59.45	>100	0.0204	0.0148	4	2
	Direct Available P2O5/Spectrophotometric, Citrate-EDTA Ext. (%)									
041.21	Direct Available P2O5/Spectrophotometric, Citrate-EDTA Ext.	0568	0	0	0					5
041.21	Direct Available P2O5/Spectrophotometric, Citrate-EDTA Ext.	0354	0.011	0.01	0.0105					
	Direct Available P2O5/ICP, Citrate-EDTA Ext. (%)									
041.51	Direct Available P2O5/ICP, Citrate-EDTA Ext. (%)	0423	16.02	16.15	16.08					
041.51	Direct Available P2O5/ICP, Citrate-EDTA Ext. (%)	0027	58.99	59.93	59.46					1
	Soluble K2O/STPB Oxalate (60 %)									
050.00	Soluble K2O/STPB Oxalate (%)	0072	59.7	59.9	59.8	-2.78	60.8	0.3591	9	
050.00	Soluble K2O/STPB Oxalate (%)	0049	60.51	60.35	60.43	-1.02	60.8	0.3591	9	
050.00	Soluble K2O/STPB Oxalate (%)	0102	60.41	60.87	60.64	-0.44	60.8	0.3591	9	
050.00	Soluble K2O/STPB Oxalate (%)	0405	60.72	60.7	60.71	-0.24	60.8	0.3591	9	
050.00	Soluble K2O/STPB Oxalate (%)	0055	60.88	60.86	60.87	0.20	60.8	0.3591	9	

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
050.00	Soluble K2O/STPB Oxalate (%)	0220	60.97	60.99	60.98	0.51	60.8	0.3591	9	
050.00	Soluble K2O/STPB Oxalate (%)	0231	61.01	61.01	61.01	0.59	60.8	0.3591	9	7
050.00	Soluble K2O/STPB Oxalate (%)	0602	60.83	61.22	61.02	0.63	60.8	0.3591	9	
050.00	Soluble K2O/STPB Oxalate (%)	0494	60.35	62.01	61.18	1.06	60.8	0.3591	9	
050.00	Soluble K2O/STPB Oxalate (%)	0561	61.26	61.25	61.26	1.27	60.8	0.3591	9	
Soluble K2O/AA (Oxalate) (60 %)										
050.30	Soluble K2O/AA (Oxalate) (%)	0309	61.02	61.15	61.08					
050.30	Soluble K2O/AA (Oxalate) (%)	0040	64	64.5	64.25					
Soluble K2O/AA (Citrate-EDTA) (60 %)										
050.32	Soluble K2O/AA (Citrate-EDTA) (%)	0472	46.65	54.66	50.66					1
050.32	Soluble K2O/AA (Citrate-EDTA) (%)	0185	60.22	60.19	60.2					
Soluble K2O/ICP (Oxalate) (60 %)										
050.50	Soluble K2O/ICP (Oxalate) (%)	0324	60.4	58	59.2	-1.33	60.05	0.6408	8	
050.50	Soluble K2O/ICP (Oxalate) (%)	0073	60.15	59.12	59.64	-0.65	60.05	0.6408	8	
050.50	Soluble K2O/ICP (Oxalate) (%)	0292	59.86	59.62	59.74	-0.49	60.05	0.6408	8	
050.50	Soluble K2O/ICP (Oxalate) (%)	0106	59.48	60.42	59.95	-0.16	60.05	0.6408	8	
050.50	Soluble K2O/ICP (Oxalate) (%)	0169	60.08	60.1	60.09	0.06	60.05	0.6408	8	
050.50	Soluble K2O/ICP (Oxalate) (%)	0055	59.23	61.16	60.2	0.22	60.05	0.6408	8	
050.50	Soluble K2O/ICP (Oxalate) (%)	0356	60.31	60.86	60.58	0.83	60.05	0.6408	8	
050.50	Soluble K2O/ICP (Oxalate) (%)	0422	63.62	62.813	63.22 ‡	4.94	60.05	0.6408	8	

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
	Soluble K2O/ICP (Citrate) (60 %)									
050.51	Soluble K2O/ICP (Citrate) (%)	0452	60.12	60.23	60.18	-0.93	60.95	0.8329	4	
050.51	Soluble K2O/ICP (Citrate) (%)	0568	60.3	60.3	60.3	-0.78	60.95	0.8329	4	7
050.51	Soluble K2O/ICP (Citrate) (%)	0368	61.1827	61.7663	61.47	0.63	60.95	0.8329	4	
050.51	Soluble K2O/ICP (Citrate) (%)	0291	61.84	61.83	61.84	1.07	60.95	0.8329	4	
	Soluble K2O/ICP (Citrate-EDTA) (60 %)									
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0543	55.817	55.982	55.9 †	-4.27	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0377	60.09	58.57	59.33	-1.14	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0233	58.11	61.08	59.6	-0.90	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0136	61.1	60	60.55	-0.03	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0023	60.3	60.984	60.64	0.06	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0354	60.7	60.7	60.7	0.11	60.58	1.096	11	7
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0177	60.7575	60.9854	60.87	0.27	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0494	60.22	61.53	60.88	0.27	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0043	61.51	60.69	61.1	0.48	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0025	59.2	63.9	61.55	0.89	60.58	1.096	11	
050.52	Soluble K2O/ICP (Citrate-EDTA) (%)	0485	62.3	62.7	62.5 ‡	1.75	60.58	1.096	11	
	Soluble K2O/Flame Photometric (Oxalate) (60 %)									
050.60	Soluble K2O/Flame Photometric (Oxalate) (%)	0169	60.3	60.25	60.28					
050.60	Soluble K2O/Flame Photometric (Oxalate) (%)	0602	60.83	61.22	61.02					

							³ Robust Stats			
Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	Robust Mean	StDev	n used	⁴ Flag
	Soluble K2O/Flame Photometric (Citrate) (60 %)									
050.61	Soluble K2O/Flame Photometric (Citrate) (%)	0035	61.1	61.2	61.15					
	Soluble K2O/Flame Photometric (Citrate-EDTA) (60 %)									
050.62	Soluble K2O/Flame Photometric (Citrate-EDTA) (%)	0517	60.8	60.85	60.82	-0.98	61.93	1.133	3	
050.62	Soluble K2O/Flame Photometric (Citrate-EDTA) (%)	0095	61.17	62.6	61.88	-0.04	61.93	1.133	3	
050.62	Soluble K2O/Flame Photometric (Citrate-EDTA) (%)	0029	64	62.18	63.09	1.02	61.93	1.133	3	
	Soluble K2O/Other (60 %)									
050.99	Soluble K2O/Other (%)	0515	45.82	54.63	50.22 †	-6.88	60.29	1.463	32	1
050.99	Soluble K2O/Other (%)	0389	54.6	54.3	54.45 †	-3.99	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0524	55.7397	58.2079	56.97 †	-2.27	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0588	56.83	58.12	57.48 †	-1.93	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0042	56	59.2	57.6 †	-1.84	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0624	58.77	58.6	58.68	-1.10	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0371	59.05	59.17	59.11	-0.81	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0255	59.574	59.08	59.33	-0.66	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0647	60.23	59.02	59.62	-0.46	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0513	59.79	59.82	59.8	-0.33	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0521	59.8729	59.8729	59.87	-0.29	60.29	1.463	32	7
050.99	Soluble K2O/Other (%)	0556	59.85	59.95	59.9	-0.27	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0614	59.85	60.01	59.93	-0.25	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0553	60.08	59.92	60	-0.20	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0559	60.13	60.12	60.12	-0.11	60.29	1.463	32	

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
050.99	Soluble K2O/Other (%)	0551	60.12	60.15	60.14	-0.11	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0653	60.14	60.15	60.14	-0.10	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0612	57.69	62.8	60.24	-0.03	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0600	60.2	60.4	60.3	0.01	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0584	60.47	60.24	60.36	0.04	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0518	60.43	60.29	60.36	0.05	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0615	60.3	60.8	60.55	0.18	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0538	61.1	60.8	60.95	0.45	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0539	61.02	60.9	60.96	0.46	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0481	60.29	61.69	60.99	0.48	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0602	60.83	61.22	61.02	0.50	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0234	61.31	61	61.16	0.59	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0451	61.34	61.57	61.46	0.80	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0394	62.03	62.393	62.21 ‡	1.31	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0527	61.9877	62.5478	62.27 ‡	1.35	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0433	62.26	63.14	62.7 ‡	1.65	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0605	62.51	63.41	62.96 ‡	1.82	60.29	1.463	32	
050.99	Soluble K2O/Other (%)	0307	62.5	65	63.75 ‡	2.36	60.29	1.463	32	

Water (Free)/Vacuum Oven (%)

060.00	Water (Free)/Vacuum Oven (%)	0539	0.41	0.45	0.43	
060.00	Water (Free)/Vacuum Oven (%)	0538	0.43	0.48	0.455	

Water (Free)/Karl Fischer (%)

060.20	Water (Free)/Karl Fischer (%)	0513	0.164	0.167	0.1655	
--------	-------------------------------	------	-------	-------	--------	--

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
060.20	Water (Free)/Karl Fischer (%)	0371	0.35	0.35	0.35					7
Water (Free)/AFPC No. 2B (105°C oven for 2 hours, 5g sample) (%)										
060.30	Water (Free)/AFPC No. 2B (105°C oven for 2 hours, 5g sample	0220	0.1	0.1	0.1					7
060.30	Water (Free)/AFPC No. 2B (105°C oven for 2 hours, 5g sample	0394	0.101	0.104	0.1025					
Water (Free)/Other (%)										
060.99	Water (Free)/Other (%)	0481	<0.1	<0.1	<0.1					6
060.99	Water (Free)/Other (%)	0136	0.0245	0.026	0.0252					
060.99	Water (Free)/Other (%)	0405	0.088	0.088	0.088					7
060.99	Water (Free)/Other (%)	0561	0.27	0.27	0.27					7
Acid Soluble Ca/ICP, test portion inorganic 965.09 (%)										
101.30	Acid Soluble Ca/ICP, test portion inorganic 965.09 (%)	0568	0.0787	0.0787	0.0787					7
101.30	Acid Soluble Ca/ICP, test portion inorganic 965.09 (%)	0354	0.14	0.15	0.145					1
Acid Soluble Ca/ICP, 2017.02 (%)										
101.33	Acid Soluble Ca/ICP, 2017.02 (%)	0527	<0.01	<0.01	<0.01					6
101.33	Acid Soluble Ca/ICP, 2017.02 (%)	0472	0.08	0.08	0.08					7
Acid Soluble Mg/ICP, test portion inorganic 965.09 (%)										
121.30	Acid Soluble Mg/ICP, test portion inorganic 965.09 (%)	0568	0.0588	0.0588	0.0588					7
121.30	Acid Soluble Mg/ICP, test portion inorganic 965.09 (%)	0354	0.06	0.07	0.065					
Acid Soluble Mg/ICP, 2017.02 (%)										
121.33	Acid Soluble Mg/ICP, 2017.02 (%)	0527	0.0518	0.0485	0.0502	-0.93	0.0558	0.0061	3	

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
121.33	Acid Soluble Mg/ICP, 2017.02 (%)	0472	0.05	0.06	0.055	-0.13	0.0558	0.0061	3	
121.33	Acid Soluble Mg/ICP, 2017.02 (%)	0494	0.0644	0.0602	0.0623	1.06	0.0558	0.0061	3	
Acid Soluble Mg/Other (%)										
121.99	Acid Soluble Mg/Other (%)	0524	0.0487	0.0539	0.0513					
Total S/ICP, test portion as in 2017.02 (%)										
148.07	Total S/ICP, test portion as in 2017.02 (%)	0527	<0.1	<0.1	<0.1					6
148.07	Total S/ICP, test portion as in 2017.02 (%)	0472	0.03	0.02	0.025					
Total S/Other (%)										
148.99	Total S/Other (%)	0422	0.022	0.024	0.023					
148.99	Total S/Other (%)	0354	0.03	0.04	0.035					
S - HNO3 soluble/ICP (%)										
149.04	S - HNO3 soluble/ICP (%)	0524	0.0251	0.026	0.0256					
Acid Soluble As/ICP (ppm)										
151.30	Acid Soluble As/ICP (ppm)	0605	<6.25	<6.25	<6.25					6
151.30	Acid Soluble As/ICP (ppm)	0255	0	0	0					5
151.30	Acid Soluble As/ICP (ppm)	0524	0.0401	0.0656	0.0528					
151.30	Acid Soluble As/ICP (ppm)	0523	0.126	0.149	0.1375					
Acid Soluble As/ICP, 2006.03 (ppm)										
151.32	Acid Soluble As/ICP, 2006.03 (ppm)	0220	<0.5	<0.5	<0.5					6
151.32	Acid Soluble As/ICP, 2006.03 (ppm)	0405	<3	<3	<3					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
151.32	Acid Soluble As/ICP, 2006.03 (ppm)	0485	2.31	1.65	1.98					1
Acid Soluble As/ICP, 2017.02 (ppm)										
151.33	Acid Soluble As/ICP, 2017.02 (ppm)	0527	<0.0001	<0.0001	<0.0001					6
151.33	Acid Soluble As/ICP, 2017.02 (ppm)	0515	<0.25	<0.25	<0.25					6
151.33	Acid Soluble As/ICP, 2017.02 (ppm)	0136	<1	<1	<1					6
151.33	Acid Soluble As/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
151.33	Acid Soluble As/ICP, 2017.02 (ppm)	0117	<10	<10	<10					6
Acid Soluble As/ICP, EPA 3050B/6010C (ppm)										
151.34	Acid Soluble As/ICP, EPA 3050B/6010C (ppm)	0368	<0.3	<0.3	<0.3					6
151.34	Acid Soluble As/ICP, EPA 3050B/6010C (ppm)	0515	<0.406	<0.406	<0.406					6
Acid Soluble As/Other (ppm)										
151.99	Acid Soluble As/Other (ppm)	0481	<0.5	<0.5	<0.5					6
151.99	Acid Soluble As/Other (ppm)	0220	<0.5	<0.5	<0.5					6
Acid Soluble B/ICP, test portion in 982.01 (%)										
165.30	Acid Soluble B/ICP, test portion in 982.01 (%)	0354	<0.01	<0.01	<0.01					6
Acid Soluble B/Other (%)										
165.99	Acid Soluble B/Other (%)	0527	<0.01	<0.01	<0.01					6
165.99	Acid Soluble B/Other (%)	0524	0.0001	0.0001	0.0001					7
Acid Soluble Cd/ICP (ppm)										
181.30	Acid Soluble Cd/ICP (ppm)	0394	<0.1	<0.1	<0.1					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
181.30	Acid Soluble Cd/ICP (ppm)	0605	<0.25	<0.25	<0.25					6
181.30	Acid Soluble Cd/ICP (ppm)	0524	0.018	0.0198	0.0189					
181.30	Acid Soluble Cd/ICP (ppm)	0523	0.024	0.02	0.022					
181.30	Acid Soluble Cd/ICP (ppm)	0255	0.854	0.649	0.7515					1
Acid Soluble Cd/ICP, 2006.03 (ppm)										
181.32	Acid Soluble Cd/ICP, 2006.03 (ppm)	0220	<0.1	<0.1	<0.1					6
181.32	Acid Soluble Cd/ICP, 2006.03 (ppm)	0485	<0.2	<0.2	<0.2					6
181.32	Acid Soluble Cd/ICP, 2006.03 (ppm)	0405	<1	<1	<1					6
Acid Soluble Cd/ICP, 2017.02 (ppm)										
181.33	Acid Soluble Cd/ICP, 2017.02 (ppm)	0527	<0.0001	<0.0001	<0.0001					6
181.33	Acid Soluble Cd/ICP, 2017.02 (ppm)	0515	<0.19	<0.19	<0.19					6
181.33	Acid Soluble Cd/ICP, 2017.02 (ppm)	0136	<1	<1	<1					6
181.33	Acid Soluble Cd/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
181.33	Acid Soluble Cd/ICP, 2017.02 (ppm)	0117	<5	<5	<5					6
181.33	Acid Soluble Cd/ICP, 2017.02 (ppm)	0086	<5	<5	<5					6
Acid Soluble Cd/ICP, EPA 3050B/6010C (ppm)										
181.34	Acid Soluble Cd/ICP, EPA 3050B/6010C (ppm)	0515	<0.333	<0.333	<0.333					6
181.34	Acid Soluble Cd/ICP, EPA 3050B/6010C (ppm)	0368	0.3	0.2	0.25					
Acid Soluble Cd/Other (ppm)										
181.99	Acid Soluble Cd/Other (ppm)	0220	<0.1	<0.1	<0.1					6
181.99	Acid Soluble Cd/Other (ppm)	0481	<0.5	<0.5	<0.5					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
181.99	Acid Soluble Cd/Other (ppm)	0371	0.17	0.17	0.17					7
Water Soluble Cl/Titrimetric (%)										
190.00	Water Soluble Cl/Titrimetric (%)	0553	44.75	44.5	44.62	-1.25	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0538	45.4	45.1	45.25	-0.88	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0539	45.36	45.2	45.28	-0.86	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0220	45.23	45.37	45.3	-0.85	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0029	46.32	46.74	46.53	-0.12	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0513	46.64	46.54	46.59	-0.09	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0405	47.54	47.56	47.55	0.48	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0394	47.8	47.76	47.78	0.62	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0561	47.97	47.96	47.96	0.73	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0231	47.89	48.09	47.99	0.74	46.74	1.689	11	
190.00	Water Soluble Cl/Titrimetric (%)	0605	50.59	50.25	50.42	2.18	46.74	1.689	11	
Water Soluble Cl/Other (%)										
190.99	Water Soluble Cl/Other (%)	0136	44.7	46.9	45.8	-1.08	46.72	0.8537	4	1
190.99	Water Soluble Cl/Other (%)	0029	46.62	46.24	46.43	-0.34	46.72	0.8537	4	
190.99	Water Soluble Cl/Other (%)	0481	46.96	46.7	46.83	0.12	46.72	0.8537	4	
190.99	Water Soluble Cl/Other (%)	0524	47.7925	47.878	47.84	1.30	46.72	0.8537	4	
Acid Soluble Cr/ICP (ppm)										
191.30	Acid Soluble Cr/ICP (ppm)	0394	<2	<2	<2		0.7922	0.701	4	6
191.30	Acid Soluble Cr/ICP (ppm)	0524	0.2778	0.3045	0.2912	-0.71	0.7922	0.701	4	
191.30	Acid Soluble Cr/ICP (ppm)	0389	0.31	0.3	0.305	-0.69	0.7922	0.701	4	

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
191.30	Acid Soluble Cr/ICP (ppm)	0523	0.822	0.753	0.7875	-0.01	0.7922	0.701	4	
191.30	Acid Soluble Cr/ICP (ppm)	0605	1.88	1.69	1.785	1.42	0.7922	0.701	4	
Acid Soluble Cr/ICP, 2006.03 (ppm)										
191.32	Acid Soluble Cr/ICP, 2006.03 (ppm)	0405	<1	<1	<1					6
191.32	Acid Soluble Cr/ICP, 2006.03 (ppm)	0220	0.4	0.43	0.415					
Acid Soluble Cr/ICP, 2017.02 (ppm)										
191.33	Acid Soluble Cr/ICP, 2017.02 (ppm)	0527	<0.0001	<0.0001	<0.0001					6
191.33	Acid Soluble Cr/ICP, 2017.02 (ppm)	0515	0.749	<0.22	<0.22					6
191.33	Acid Soluble Cr/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
191.33	Acid Soluble Cr/ICP, 2017.02 (ppm)	0086	<10	<10	<10					6
191.33	Acid Soluble Cr/ICP, 2017.02 (ppm)	0136	<2.5	<2.5	<2.5					6
191.33	Acid Soluble Cr/ICP, 2017.02 (ppm)	0117	<5	<5	<5					6
Acid Soluble Cr/ICP, EPA 3050B/6010C (ppm)										
191.34	Acid Soluble Cr/ICP, EPA 3050B/6010C (ppm)	0368	0.6	0.6	0.6					7
191.34	Acid Soluble Cr/ICP, EPA 3050B/6010C (ppm)	0515	10.9	4.95	7.925					1
Acid Soluble Cr/Other (ppm)										
191.99	Acid Soluble Cr/Other (ppm)	0481	<20	<20	<20					6
191.99	Acid Soluble Cr/Other (ppm)	0220	0.43	0.43	0.43					7
Acid Soluble Co/ICP (ppm)										
202.30	Acid Soluble Co/ICP (ppm)	0605	<1.25	<1.25	<1.25					6
202.30	Acid Soluble Co/ICP (ppm)	0523	0.105	0.106	0.1055					

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
202.30	Acid Soluble Co/ICP (ppm)	0524	0.2832	0.3028	0.293					
Acid Soluble Co/ICP, 2006.03 (ppm)										
202.32	Acid Soluble Co/ICP, 2006.03 (ppm)	0485	<0.1	<0.1	<0.1					6
202.32	Acid Soluble Co/ICP, 2006.03 (ppm)	0220	<0.1	<0.1	<0.1					6
202.32	Acid Soluble Co/ICP, 2006.03 (ppm)	0405	<1	<1	<1					6
Acid Soluble Co/ICP, 2017.02 (ppm)										
202.33	Acid Soluble Co/ICP, 2017.02 (ppm)	0527	<0.0001	<0.0001	<0.0001					6
202.33	Acid Soluble Co/ICP, 2017.02 (ppm)	0515	<0.26	<0.26	<0.26					6
202.33	Acid Soluble Co/ICP, 2017.02 (ppm)	0086	<10	<10	<10					6
202.33	Acid Soluble Co/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
202.33	Acid Soluble Co/ICP, 2017.02 (ppm)	0136	<2.5	<2.5	<2.5					6
202.33	Acid Soluble Co/ICP, 2017.02 (ppm)	0117	<5	<5	<5					6
Acid Soluble Co/ICP, EPA 3050B/6010C (ppm)										
202.34	Acid Soluble Co/ICP, EPA 3050B/6010C (ppm)	0368	<0.1	<0.1	<0.1					6
202.34	Acid Soluble Co/ICP, EPA 3050B/6010C (ppm)	0515	<0.324	<0.324	<0.324					6
Acid Soluble Co/Other (ppm)										
202.99	Acid Soluble Co/Other (ppm)	0220	<0.1	<0.1	<0.1					6
202.99	Acid Soluble Co/Other (ppm)	0481	<20	<20	<20					6
202.99	Acid Soluble Co/Other (ppm)	0255	1.934	2.805	2.37					1
Acid Soluble Cu/ICP, test portion inorganic 965.09 (%)										
221.30	Acid Soluble Cu/ICP, test portion inorganic 965.09 (%)	0354	<0.01	<0.01	<0.01					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
221.30	Acid Soluble Cu/ICP, test portion inorganic 965.09 (%)	0255	0	0	0					5
Acid Soluble Cu/ICP, test portion 2006.03A-C (%)										
221.32	Acid Soluble Cu/ICP, test portion 2006.03A-C (%)	0405	<0.0002	<0.0002	<0.0002					6
Acid Soluble Cu/ICP, 2017.02 (%)										
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0527	<0.0001	<0.0001	<0.0001					6
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0136	<0.0002	<0.0002	<0.0002					6
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0394	<0.0002	<0.0002	<0.0002					6
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0515	<0.0003	<0.0003	<0.0003					6
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0027	<0.001	<0.001	<0.001					6
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0117	<0.0025	<0.0025	<0.0025					6
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0086	<10	<10	<10					6
221.33	Acid Soluble Cu/ICP, 2017.02 (%)	0106	0	0	0					5
Acid Soluble Cu/Other (%)										
221.99	Acid Soluble Cu/Other (%)	0515	<0.0003	<0.0003	<0.0003					6
221.99	Acid Soluble Cu/Other (%)	0481	<0.01	<0.01	<0.01					6
221.99	Acid Soluble Cu/Other (%)	0368	0.0005	0.0006	0.0006					
221.99	Acid Soluble Cu/Other (%)	0523	0.002	0.002	0.002					7
Acid Soluble Fe/ICP, test portion inorganic 965.09 (%)										
241.30	Acid Soluble Fe/ICP, test portion inorganic 965.09 (%)	0354	0.01	0.03	0.02					1
Acid Soluble Fe/ICP, 2017.02 (%)										
241.33	Acid Soluble Fe/ICP, 2017.02 (%)	0472	0.01	0.01	0.01	-1.15	0.0125	0.0022	3	7

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
241.33	Acid Soluble Fe/ICP, 2017.02 (%)	0494	0.0128	0.0145	0.0136	0.53	0.0125	0.0022	3	
241.33	Acid Soluble Fe/ICP, 2017.02 (%)	0527	0.0137	0.014	0.0138	0.62	0.0125	0.0022	3	
Acid Soluble Fe/Other (%)										
241.99	Acid Soluble Fe/Other (%)	0524	0.0126	0.0129	0.0128					
Acid Soluble Pb/ICP (ppm)										
251.30	Acid Soluble Pb/ICP (ppm)	0394	<1	<1	<1					6
251.30	Acid Soluble Pb/ICP (ppm)	0605	<6.25	<6.25	<6.25					6
251.30	Acid Soluble Pb/ICP (ppm)	0255	0	0	0					5
251.30	Acid Soluble Pb/ICP (ppm)	0523	0.141	0.146	0.1435					
251.30	Acid Soluble Pb/ICP (ppm)	0524	0.2371	0.2589	0.248					
Acid Soluble Pb/ICP, 2006.03 (ppm)										
251.32	Acid Soluble Pb/ICP, 2006.03 (ppm)	0405	<4	<4	<4					6
251.32	Acid Soluble Pb/ICP, 2006.03 (ppm)	0220	0.38	0.44	0.41					
251.32	Acid Soluble Pb/ICP, 2006.03 (ppm)	0485	0.399	0.429	0.414					
Acid Soluble Pb/ICP, 2017.02 (ppm)										
251.33	Acid Soluble Pb/ICP, 2017.02 (ppm)	0527	<0.0001	<0.0001	<0.0001					6
251.33	Acid Soluble Pb/ICP, 2017.02 (ppm)	0515	<0.21	<0.21	<0.21					6
251.33	Acid Soluble Pb/ICP, 2017.02 (ppm)	0086	<1	<1	<1					6
251.33	Acid Soluble Pb/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
251.33	Acid Soluble Pb/ICP, 2017.02 (ppm)	0136	<3	<3	<3					6
251.33	Acid Soluble Pb/ICP, 2017.02 (ppm)	0117	<5	<5	<5					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
	Acid Soluble Pb/ICP, EPA 3050B/6010C (ppm)									
251.34	Acid Soluble Pb/ICP, EPA 3050B/6010C (ppm)	0515	<0.496	<0.496	<0.496					6
251.34	Acid Soluble Pb/ICP, EPA 3050B/6010C (ppm)	0368	3.8	3.7	3.75					1
	Acid Soluble Pb/Other (ppm)									
251.99	Acid Soluble Pb/Other (ppm)	0481	<1	<1	<1					6
251.99	Acid Soluble Pb/Other (ppm)	0371	0.18	0.16	0.17					
251.99	Acid Soluble Pb/Other (ppm)	0220	0.38	0.37	0.375					
	Acid Soluble Mn/ICP, test portion 972.02a (%)									
261.30	Acid Soluble Mn/ICP, test portion 972.02a (%)	0354	<0.01	<0.01	<0.01					6
	Acid Soluble Mn/ICP, 2017.02 (%)									
261.35	Acid Soluble Mn/ICP, 2017.02 (%)	0527	<0.0001	<0.0001	<0.0001					6
	Acid Soluble Mn/Other (%)									
261.99	Acid Soluble Mn/Other (%)	0524	0.0001	0.0001	0.0001					7
	Acid Soluble Hg/AA (ppm)									
281.00	Acid Soluble Hg/AA (ppm)	0481	<0.5	<0.5	<0.5					6
	Acid Soluble Hg/ICP (ppm)									
281.30	Acid Soluble Hg/ICP (ppm)	0527	<0.001	<0.001	<0.001					6
281.30	Acid Soluble Hg/ICP (ppm)	0515	<0.01	<0.01	<0.01					6
281.30	Acid Soluble Hg/ICP (ppm)	0371	<0.05	<0.05	<0.05					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
281.30	Acid Soluble Hg/ICP (ppm)	0605	<1.25	<1.25	<1.25					6
281.30	Acid Soluble Hg/ICP (ppm)	0405	<2	<2	<2					6
Acid Soluble Hg/Other (ppm)										
281.99	Acid Soluble Hg/Other (ppm)	0220	<0.01	<0.01	<0.01					6
281.99	Acid Soluble Hg/Other (ppm)	0025	0	0	0					5
Acid Soluble Mo/ICP (ppm)										
289.30	Acid Soluble Mo/ICP (ppm)	0255	0	0	0					5
289.30	Acid Soluble Mo/ICP (ppm)	0523	0.01	0.01	0.01					7
289.30	Acid Soluble Mo/ICP (ppm)	0524	0.1667	0.2233	0.195					
Acid Soluble Mo/ICP, 2006.03 (ppm)										
289.32	Acid Soluble Mo/ICP, 2006.03 (ppm)	0220	<0.1	<0.1	<0.1					6
289.32	Acid Soluble Mo/ICP, 2006.03 (ppm)	0485	0.441	<0.2	<0.2					6
289.32	Acid Soluble Mo/ICP, 2006.03 (ppm)	0405	<1	<1	<1					6
Acid Soluble Mo/ICP, 2017.02 (ppm)										
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	0515	<0.23	<0.23	<0.23					6
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	0136	<2.5	<2.5	<2.5					6
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	0086	<5	<5	<5					6
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	0106	0	0	0					5
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	0527	3.5172	3.6502	3.584					
289.33	Acid Soluble Mo/ICP, 2017.02 (ppm)	0117	6.677	2.623	4.65					1

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
	Acid Soluble Mo/ICP, EPA 3050B/6010C (ppm)									
289.34	Acid Soluble Mo/ICP, EPA 3050B/6010C (ppm)	0368	0	<0.1	<0.1					6
289.34	Acid Soluble Mo/ICP, EPA 3050B/6010C (ppm)	0515	<0.255	<0.255	<0.255					6
	Acid Soluble Mo/Other (ppm)									
289.99	Acid Soluble Mo/Other (ppm)	0220	<0.1	<0.1	<0.1					6
289.99	Acid Soluble Mo/Other (ppm)	0481	<50	<50	<50					6
	Acid Soluble Ni/ICP (ppm)									
291.30	Acid Soluble Ni/ICP (ppm)	0605	<1.25	<1.25	<1.25		0.2592	0.0223	3	6
291.30	Acid Soluble Ni/ICP (ppm)	0394	<2	<2	<2		0.2592	0.0223	3	6
291.30	Acid Soluble Ni/ICP (ppm)	0389	0.23	0.24	0.235	-1.08	0.2592	0.0223	3	
291.30	Acid Soluble Ni/ICP (ppm)	0524	0.2601	0.2668	0.2634	0.19	0.2592	0.0223	3	
291.30	Acid Soluble Ni/ICP (ppm)	0523	0.265	0.293	0.279	0.89	0.2592	0.0223	3	
	Acid Soluble Ni/ICP, 2006.03 (ppm)									
291.32	Acid Soluble Ni/ICP, 2006.03 (ppm)	0405	<1	<1	<1					6
291.32	Acid Soluble Ni/ICP, 2006.03 (ppm)	0485	0.214	0.173	0.1935					
291.32	Acid Soluble Ni/ICP, 2006.03 (ppm)	0220	0.27	0.29	0.28					
	Acid Soluble Ni/ICP, 2017.02 (ppm)									
291.33	Acid Soluble Ni/ICP, 2017.02 (ppm)	0527	<0.0001	<0.0001	<0.0001					6
291.33	Acid Soluble Ni/ICP, 2017.02 (ppm)	0515	<0.26	<0.26	<0.26					6
291.33	Acid Soluble Ni/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
291.33	Acid Soluble Ni/ICP, 2017.02 (ppm)	0086	<10	<10	<10					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
291.33	Acid Soluble Ni/ICP, 2017.02 (ppm)	0136	<2.5	<2.5	<2.5					6
291.33	Acid Soluble Ni/ICP, 2017.02 (ppm)	0117	<5	<5	<5					6
Acid Soluble Ni/ICP, EPA 3050B/6010C (ppm)										
291.34	Acid Soluble Ni/ICP, EPA 3050B/6010C (ppm)	0368	<0.2	<0.2	<0.2					6
291.34	Acid Soluble Ni/ICP, EPA 3050B/6010C (ppm)	0515	<0.483	<0.483	<0.483					6
Acid Soluble Ni/Other (ppm)										
291.99	Acid Soluble Ni/Other (ppm)	0481	<20	<20	<20					6
291.99	Acid Soluble Ni/Other (ppm)	0220	0.28	0.25	0.265					
291.99	Acid Soluble Ni/Other (ppm)	0255	3.367	2.826	3.096					1
Acid Soluble Se/ICP (ppm)										
301.30	Acid Soluble Se/ICP (ppm)	0605	<6.25	<6.25	<6.25					6
301.30	Acid Soluble Se/ICP (ppm)	0524	0.105	0.1477	0.1264					
301.30	Acid Soluble Se/ICP (ppm)	0523	0.231	0.268	0.2495					
Acid Soluble Se/ICP, 2006.03 (ppm)										
301.32	Acid Soluble Se/ICP, 2006.03 (ppm)	0220	<0.3	<0.3	<0.3					6
301.32	Acid Soluble Se/ICP, 2006.03 (ppm)	0405	<10	<10	<10					6
Acid Soluble Se/ICP, 2017.02 (ppm)										
301.33	Acid Soluble Se/ICP, 2017.02 (ppm)	0527	<0.01	<0.01	<0.01					6
301.33	Acid Soluble Se/ICP, 2017.02 (ppm)	0515	<0.27	<0.27	<0.27					6
301.33	Acid Soluble Se/ICP, 2017.02 (ppm)	0027	<10	<10	<10					6
301.33	Acid Soluble Se/ICP, 2017.02 (ppm)	0117	<5	<5	<5					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
Acid Soluble Se/ICP, EPA 3050B/6010C (ppm)										
301.34	Acid Soluble Se/ICP, EPA 3050B/6010C (ppm)	0515	<0.554	<0.554	<0.554					6
301.34	Acid Soluble Se/ICP, EPA 3050B/6010C (ppm)	0368	<1	<1.1	<1.1					6
Acid Soluble Se/Other (ppm)										
301.99	Acid Soluble Se/Other (ppm)	0485	<0.02	<0.02	<0.02					6
301.99	Acid Soluble Se/Other (ppm)	0220	<0.3	<0.3	<0.3					6
301.99	Acid Soluble Se/Other (ppm)	0481	<0.5	<0.5	<0.5					6
301.99	Acid Soluble Se/Other (ppm)	0255	0	0	0					5
Sodium/Flame Photometric (%)										
311.30	Sodium/Flame Photometric (%)	0513	1.05	1.05	1.05	-0.95	1.55	0.5291	4	7
311.30	Sodium/Flame Photometric (%)	0405	1.143	1.13	1.136	-0.78	1.55	0.5291	4	
311.30	Sodium/Flame Photometric (%)	0538	2.1	1.9	2	0.85	1.55	0.5291	4	
311.30	Sodium/Flame Photometric (%)	0539	2.08	1.95	2.015	0.88	1.55	0.5291	4	
Sodium/ICP, 2006.03 test portion (%)										
311.32	Sodium/ICP, 2006.03 test portion (%)	0220	1.07	1.13	1.1					
Sodium/ICP, test portion as in 2017.02 (%)										
311.33	Sodium/ICP, test portion as in 2017.02 (%)	0494	1.0682	1.0517	1.06	-1.27	1.094	0.0265	4	
311.33	Sodium/ICP, test portion as in 2017.02 (%)	0043	1.075	1.106	1.09	-0.12	1.094	0.0265	4	
311.33	Sodium/ICP, test portion as in 2017.02 (%)	0136	1.1	1.1	1.1	0.24	1.094	0.0265	4	7
311.33	Sodium/ICP, test portion as in 2017.02 (%)	0527	1.071	1.1768	1.124	1.15	1.094	0.0265	4	
311.33	Sodium/ICP, test portion as in 2017.02 (%)	0394	1.0004	9686	4844	>100	1.094	0.0265	4	3

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
	Sodium/Other (%)									
311.99	Sodium/Other (%)	0255	0.942	0.99	0.966	-1.42	1.051	0.06	5	
311.99	Sodium/Other (%)	0035	1.01	1.01	1.01	-0.69	1.051	0.06	5	7
311.99	Sodium/Other (%)	0481	1.09	1.08	1.085	0.56	1.051	0.06	5	
311.99	Sodium/Other (%)	0605	1.09	1.1	1.095	0.73	1.051	0.06	5	
311.99	Sodium/Other (%)	0354	1.07	1.13	1.1	0.81	1.051	0.06	5	
311.99	Sodium/Other (%)	0485	1.45	1.14	1.295	4.06	1.051	0.06	5	
	Acid Soluble Zn/AA, inorganic 965.09 (%)									
321.00	Acid Soluble Zn/AA, inorganic 965.09 (%)	0485	0.0003	0.0009	0.0006					
	Acid Soluble Zn/ICP, test portion inorganic 965.09 (%)									
321.30	Acid Soluble Zn/ICP, test portion inorganic 965.09 (%)	0354	<0.01	<0.01	<0.01					6
321.30	Acid Soluble Zn/ICP, test portion inorganic 965.09 (%)	0255	0.002	0.002	0.002					7
	Acid Soluble Zn/ICP, test portion 2006.03A-C (%)									
321.32	Acid Soluble Zn/ICP, test portion 2006.03A-C (%)	0405	<0.0003	<0.0003	<0.0003					6
321.32	Acid Soluble Zn/ICP, test portion 2006.03A-C (%)	0485	0.0003	0.0002	0.0002					
321.32	Acid Soluble Zn/ICP, test portion 2006.03A-C (%)	0220	0.0085	0.0087	0.0086					
	Acid Soluble Zn/ICP, 2017.02 (%)									
321.33	Acid Soluble Zn/ICP, 2017.02 (%)	0515	<0.0002	<0.0002	<0.0002					6
321.33	Acid Soluble Zn/ICP, 2017.02 (%)	0394	<0.0002	<0.0002	<0.0002					6
321.33	Acid Soluble Zn/ICP, 2017.02 (%)	0136	<0.0003	<0.0003	<0.0003					6
321.33	Acid Soluble Zn/ICP, 2017.02 (%)	0027	<0.001	<0.001	<0.001					6

Code	Analyte and Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
							Robust Mean	StDev	n used	⁴ Flag
321.33	Acid Soluble Zn/ICP, 2017.02 (%)	0527	<0.001	<0.001	<0.001					6
321.33	Acid Soluble Zn/ICP, 2017.02 (%)	0117	<0.0025	<0.0025	<0.0025					6
321.33	Acid Soluble Zn/ICP, 2017.02 (%)	0106	0	0	0					5
Acid Soluble Zn/Other (%)										
321.99	Acid Soluble Zn/Other (%)	0515	<0.0004	<0.0004	<0.0004					6
321.99	Acid Soluble Zn/Other (%)	0481	<0.01	<0.01	<0.01					6
321.99	Acid Soluble Zn/Other (%)	0368	0.0002	0.0004	0.0003					
321.99	Acid Soluble Zn/Other (%)	0523	0.002	0.003	0.0025					
321.99	Acid Soluble Zn/Other (%)	0389	0.478	0.438	0.458					3

1. Lab Data: Lab Value is the average of 2 reported lab results. † or ‡ beside Lab Value denotes the value exceeds the investigational allowance (IA) around the analyte mean. † denotes value is less than IA and ‡ denotes value is greater than IA. This is noted for guaranteed analytes with # of observations >= 6. Method code and analyte name are shown in green for guaranteed analytes along with guaranteed concentration.

2. Z score: Red = Z value >3 or <-3 (action required), Orange = Z value between 2 and 3 or -2 and -3 (warning), Green = Z value between -2 and 2 (pass). Z values are shown for data sets with number of observation used (n used) >= 3 for Lab Values that are not an analytical limit or 0. Color ratings shown for number of observations used (n used) >=6. Z values were calculated as (Lab Value - Mean Value)/(Standard Deviation). Unspecified methods identified as "Other" are shown in grey without color ratings on Z-score.

3. Statistical parameters: Robust statistics was employed to determine mean and standard deviation (StDev) if number of observations used (n used) >=6 (blue background). Classical statistics was employed if number of observations used (n used) = 3, 4, or 5 (pink background). Flags identify data not used to calculate statistical parameters.

4. Flag: Flag number identifies why data was not used to determine statistical parameters. 1 = data rejected for dups too far apart, 2 = rejected as extreme outlier, 3 = rejected for both dups too far apart and extreme outlier, 4 = removed after manual inspection, 5 = rejected due to zero(s) submitted, 6 = rejected due to analytical limit submitted (eg "<0.1"), 7 = Lab's range rejected for determining mean range on Report Cards due to identical values reported for two results.

Appendix

Content Description of Method All Tests Report

The All Tests reports have results listed for every lab grouped by Method with data in each group sorted by lab value. The reports are helpful to see where your lab result fell within the whole set of data for the Method by identifying your results by your lab code. Data on the right side of the report shows the mean, standard deviation, and number of observations (obs) used in the analysis of each group. An observation was a lab value for a test which was the average of reported duplicate results. Determination of mean and standard deviation followed protocols in ISO 13528:2015(E) (Statistical methods for use in proficiency testing by interlaboratory comparison) where robust statistics was used to determine the mean and standard deviation for 6 or more observations. Robust statistics has an advantage of removing undesired influence of outlying data on the mean and standard deviation without removing data from the statistical analysis. Robust statistics is only appropriate for use on data sets with 6 or more observations. For data sets with 3, 4, or 5 observations, classical calculation of mean and standard deviation was performed. Z scores for data sets with a small number of observations are given less importance as indicated by no color coding of Z score with less than 6 observations. No Z scores were determined for 1 or 2 observations.

Before determining mean and standard deviation for a set of data, data was removed from statistical analysis for various reasons. Mandel statistical analysis was used to identify and remove extreme outliers and lab values from duplicate results that were too far apart (ISO 5725-2:1994, Accuracy (trueness and precision) of measurement methods and results – Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.). Any individual result report of zero or less than a limit resulted in lab value removed from analysis. The lab values removed from analysis are denoted with numerical flags on the far right-hand side of the report. Z scores are reported for data removed due to extreme outlier or duplicates too far apart even though data was not used in the determination of mean and standard deviation. However, Z scores are not reported for results reported as 0 or less than a limit. Also, any submission of just one lab result is removed for consideration in statistical analysis and presentation on reports.

The American Association of Plant Food Control Officials (AAPFCO) recommends limits around a nutrient guarantee that should initiate an investigation if observed nutrient concentration falls outside of the limits. These limits are referred to as Investigational Allowances (IAs). Lab Values that fall outside of the IA limits around the method mean are denoted with † (below limit) or ‡ (above limit). These same symbols are also used to denote Lab Values beyond IA limits on Laboratory Report Cards.