

magruder fertilizer

check sample program



STRIVING FOR EXCELLENCE IN ANALYSIS

Analyte Proficiency From All Labs

Sample # 161012

ZnSO4

Statistical Summary

Analytes: 28

Labs Reporting: 69

Issue Date : 12/31/2016

Analyte Code	Analyte	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Analyte Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	IA %RSD	Average Range (R-bar)	Horwitz %RSD
010	Total Nitrogen (%)	7	7	2.930	0.2342	2.868		0.0951	0.0449	3.32%		0.0360	3.41%
020	Total Phosphorus as P2O5 (%)	3	3	0.0541	0.0495	0.0541		0.0495	0.0357	91.47%		0.0001	6.20%
041	Direct Available Phosphorus as P2O5 (%)	2	1	0.4490									
050	Soluble Potassium as K2O (%)	7	6	1.543	0.3076	1.583		0.2514	0.1283	15.88%		0.0585	3.73%
060	Water (Free) (%)	3	3	1.400	1.427	1.400		1.427	1.030	101.93%		0.0387	3.80%
101	Acid Soluble Calcium (%)	9	9	0.1887	0.0373	0.1887		0.0423	0.0176	22.41%		0.0251	5.14%
121	Acid Soluble Magnesium (%)	10	10	0.0730	0.0101	0.0719		0.0087	0.0034	12.05%		0.0067	5.94%
143	Elemental Sulfur (%)	4	4	16.73	0.1099	16.73		0.1099	0.0687	0.66%		0.1575	2.62%
145	Sulfate Sulfur, HCl soluble (%)	6	6	16.02	0.4747	16.02		0.5383	0.2747	3.36%		0.1617	2.63%
147	Total Sulfur in Urea/Formulations (%)	1		16.16									
148	Total Sulfur (17%)	48	46	16.28	0.9714	16.22	1.0000	0.9040	0.1666	5.57%	3.08%	0.3710	2.63%
149	Sulfur - HNO3 soluble (%)	3	3	16.98	0.8890	16.98		0.8890	0.6416	5.23%		0.2464	2.61%
151	Acid Soluble Arsenic (ppm)	5	3	0.9312	1.185	0.9312		1.185	0.8551	127.24%		0.0297	16.17%
165	Acid Soluble Boron (%)	4	4	0.0107	0.0049	0.0107		0.0049	0.0031	45.75%		0.0022	7.91%
181	Acid Soluble Cadmium (ppm)	16	15	5.117	1.074	4.960		0.6037	0.1949	12.17%		0.2909	12.57%
191	Acid Soluble Chromium (ppm)	11	10	8.908	0.6244	8.908		0.7080	0.2799	7.95%		0.6408	11.51%
202	Acid Soluble Cobalt (ppm)	11	10	8.713	1.595	8.441		1.048	0.4143	12.42%		0.4740	11.60%
221	Acid Soluble Copper (%)	7	6	0.0870	0.2097	0.0025		0.0037	0.0019	146.90%		0.0321	9.84%
241.00	Acid Soluble Iron (%)	10	9	0.0342	0.0034	0.0342		0.0039	0.0016	11.36%		0.0012	6.65%
251.00	Acid Soluble Lead (ppm)	9	8	3.627	4.517	3.627		5.122	2.264	141.21%		2.198	13.18%
261.00	Acid Soluble Manganese (%)	10	10	0.1486	0.0068	0.1486		0.0077	0.0031	5.22%		0.0018	5.33%
281.00	Acid Soluble Mercury (ppm)	2	1	0.0605									
289.00	Acid Soluble Molybdenum (ppm)	9	6	3.149	4.768	1.868		2.073	1.058	110.96%		0.2062	14.56%
291.00	Acid Soluble Nickel (ppm)	17	17	91.53	9.566	91.65		10.43	3.164	11.39%		2.542	8.10%
301.00	Acid Soluble Selenium (ppm)	5	3	5.994	4.296	5.994		4.296	3.101	71.68%		4.419	12.22%
311.00	Sodium (%)	6	6	0.6375	0.0631	0.6539		0.0290	0.0148	4.43%		0.0229	4.26%
321.00	Acid Soluble Zinc (35%)	63	61	33.18	3.315	33.27	1.0000	2.230	0.3569	6.70%	1.50%	0.4615	2.36%
325.00	Water Soluble Zinc (%)	14	13	31.49	1.695	31.41		1.744	0.6048	5.55%		0.3734	2.38%

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Analytes: 28

Sample # 161012

Lab Values

Labs Reporting: 69

ZnSO4

Issue Date : 12/31/2016

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder CS Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
010	Total Nitrogen (%)	0521	2.785	0.0000	2.868	0.0951	0.0360	7	-0.79	010.60	0
010	Total Nitrogen (%)	0325	2.795	0.0900	2.868	0.0951	0.0360	7	-0.70	010.60	0
010	Total Nitrogen (%)	0354	2.819	0.0050	2.868	0.0951	0.0360	7	-0.47	010.60	0
010	Total Nitrogen (%)	0524	2.848	0.0071	2.868	0.0951	0.0360	7	-0.19	010.99	0
010	Total Nitrogen (%)	0292	2.870	0.0000	2.868	0.0951	0.0360	7	0.02	010.60	0
010	Total Nitrogen (%)	0482	2.950	0.1200	2.868	0.0951	0.0360	7	0.78	010.60	0
010	Total Nitrogen (%)	0351	3.447	0.0300	2.868	0.0951	0.0360	7	5.50	010.60	0
020	Total Phosphorus as P2O5 (%)	0524	0.0159	0.0002	0.0541	0.0495	0.0001	3	-0.77	020.50	0
020	Total Phosphorus as P2O5 (%)	0521	0.0364	0.0000	0.0541	0.0495	0.0001	3	-0.36	020.50	0
020	Total Phosphorus as P2O5 (%)	0292	0.1100	0.0000	0.0541	0.0495	0.0001	3	1.13	020.20	0
041	Direct Available Phosphorus as P2O5 (%)	0354	0.4490	0.0040				1		041.60	0
041	Direct Available Phosphorus as P2O5 (%)	0325	0.0000	0.0000				1		041.50	4
050	Soluble Potassium as K2O (%)	0354	0.9675	0.1210	1.583	0.2514	0.0585	6	-2.18	050.52	0
050	Soluble Potassium as K2O (%)	0521	1.440	0.0000	1.583	0.2514	0.0585	6	-0.51	050.99	0
050	Soluble Potassium as K2O (%)	0482	1.615	0.0900	1.583	0.2514	0.0585	6	0.11	050.99	0
050	Soluble Potassium as K2O (%)	0524	1.723	0.0101	1.583	0.2514	0.0585	6	0.50	050.99	0
050	Soluble Potassium as K2O (%)	0292	1.730	0.0000	1.583	0.2514	0.0585	6	0.52	050.50	0
050	Soluble Potassium as K2O (%)	0096	1.785	0.1300	1.583	0.2514	0.0585	6	0.71	050.99	0
050	Soluble Potassium as K2O (%)	0325	0.0000	0.0000	1.583	0.2514	0.0585	6		050.99	4
060	Water (Free) (%)	0510	0.4059	0.0020	1.400	1.427	0.0387	3	-0.70	060.99	0
060	Water (Free) (%)	0105	0.7590	0.0840	1.400	1.427	0.0387	3	-0.45	060.00	0
060	Water (Free) (%)	0513	3.035	0.0300	1.400	1.427	0.0387	3	1.15	060.30	0
101	Acid Soluble Calcium (%)	0105	0.1485	0.0130	0.1887	0.0423	0.0251	9	-0.88	101.00	0
101	Acid Soluble Calcium (%)	0482	0.1600	0.0000	0.1887	0.0423	0.0251	9	-0.63	101.30	0
101	Acid Soluble Calcium (%)	0105	0.1605	0.0030	0.1887	0.0423	0.0251	9	-0.62	101.03	0
101	Acid Soluble Calcium (%)	0117	0.1665	0.0021	0.1887	0.0423	0.0251	9	-0.49	101.33	0
101	Acid Soluble Calcium (%)	0096	0.1730	0.0020	0.1887	0.0423	0.0251	9	-0.34	101.30	0
101	Acid Soluble Calcium (%)	0025	0.1812	0.0021	0.1887	0.0423	0.0251	9	-0.16	101.33	0
101	Acid Soluble Calcium (%)	0521	0.2277	0.0000	0.1887	0.0423	0.0251	9	0.85	101.32	0
101	Acid Soluble Calcium (%)	0035	0.2305	0.1110	0.1887	0.0423	0.0251	9	0.91	101.30	0
101	Acid Soluble Calcium (%)	0354	0.2505	0.0930	0.1887	0.0423	0.0251	9	1.35	101.30	0
121	Acid Soluble Magnesium (%)	0524	0.0621	0.0002	0.0719	0.0087	0.0067	10	-1.05	121.99	0
121	Acid Soluble Magnesium (%)	0482	0.0650	0.0100	0.0719	0.0087	0.0067	10	-0.74	121.30	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder CS Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
121	Acid Soluble Magnesium (%)	0105	0.0665	0.0010	0.0719	0.0087	0.0067	10	-0.58	121.03	0
121	Acid Soluble Magnesium (%)	0117	0.0683	0.0019	0.0719	0.0087	0.0067	10	-0.39	121.33	0
121	Acid Soluble Magnesium (%)	0105	0.0685	0.0010	0.0719	0.0087	0.0067	10	-0.37	121.00	0
121	Acid Soluble Magnesium (%)	0096	0.0700	0.0000	0.0719	0.0087	0.0067	10	-0.21	121.30	0
121	Acid Soluble Magnesium (%)	0025	0.0736	0.0009	0.0719	0.0087	0.0067	10	0.18	121.33	0
121	Acid Soluble Magnesium (%)	0521	0.0773	0.0000	0.0719	0.0087	0.0067	10	0.58	121.32	0
121	Acid Soluble Magnesium (%)	0035	0.0830	0.0240	0.0719	0.0087	0.0067	10	1.19	121.30	0
121	Acid Soluble Magnesium (%)	0354	0.0960	0.0280	0.0719	0.0087	0.0067	10	2.58	121.30	0
143	Elemental Sulfur (%)	0390	16.59	0.2300	16.73	0.1099	0.1575	4	-1.29	143.99	0
143	Elemental Sulfur (%)	0472	16.72	0.2900	16.73	0.1099	0.1575	4	-0.10	143.99	0
143	Elemental Sulfur (%)	0055	16.76	0.0100	16.73	0.1099	0.1575	4	0.26	143.00	0
143	Elemental Sulfur (%)	0389	16.85	0.1000	16.73	0.1099	0.1575	4	1.13	143.99	0
145	Sulfate Sulfur, HCl soluble (%)	0444	15.36	0.0300	16.02	0.5383	0.1617	6	-1.10	145.00	0
145	Sulfate Sulfur, HCl soluble (%)	0027	15.82	0.0900	16.02	0.5383	0.1617	6	-0.34	145.00	0
145	Sulfate Sulfur, HCl soluble (%)	0485	15.85	0.3600	16.02	0.5383	0.1617	6	-0.28	145.00	0
145	Sulfate Sulfur, HCl soluble (%)	0233	15.98	0.0500	16.02	0.5383	0.1617	6	-0.07	145.00	0
145	Sulfate Sulfur, HCl soluble (%)	0200	16.42	0.3500	16.02	0.5383	0.1617	6	0.66	145.99	0
145	Sulfate Sulfur, HCl soluble (%)	0043	16.70	0.0900	16.02	0.5383	0.1617	6	1.12	145.00	0
147	Total Sulfur in Urea/Formulations (%)	0131	16.16	0.0400				1		147.99	0
148	Total Sulfur (17%)	0422	14.44*	0.6600	16.22	0.9040	0.3710	46	-1.97	148.99	0
148	Total Sulfur (17%)	0230	14.95*	0.5000	16.22	0.9040	0.3710	46	-1.41	148.01	0
148	Total Sulfur (17%)	0481	15.27	0.0400	16.22	0.9040	0.3710	46	-1.05	148.01	0
148	Total Sulfur (17%)	0117	15.36	0.0000	16.22	0.9040	0.3710	46	-0.95	148.07	0
148	Total Sulfur (17%)	0040	15.44	0.8100	16.22	0.9040	0.3710	46	-0.87	148.99	0
148	Total Sulfur (17%)	0494	15.44	0.0900	16.22	0.9040	0.3710	46	-0.87	148.07	0
148	Total Sulfur (17%)	0029	15.46	0.4300	16.22	0.9040	0.3710	46	-0.85	148.00	0
148	Total Sulfur (17%)	0351	15.47	0.0053	16.22	0.9040	0.3710	46	-0.83	148.00	0
148	Total Sulfur (17%)	0405	15.50	0.0000	16.22	0.9040	0.3710	46	-0.80	148.00	0
148	Total Sulfur (17%)	0025	15.53	0.0900	16.22	0.9040	0.3710	46	-0.77	148.00	0
148	Total Sulfur (17%)	0371	15.60	0.2000	16.22	0.9040	0.3710	46	-0.69	148.01	0
148	Total Sulfur (17%)	0096	15.65	0.0400	16.22	0.9040	0.3710	46	-0.63	148.99	0
148	Total Sulfur (17%)	0231	15.66	0.0700	16.22	0.9040	0.3710	46	-0.63	148.01	0
148	Total Sulfur (17%)	0177	15.68	0.0285	16.22	0.9040	0.3710	46	-0.60	148.07	0
148	Total Sulfur (17%)	0040	15.70	0.0000	16.22	0.9040	0.3710	46	-0.58	148.01	0
148	Total Sulfur (17%)	0520	15.72	0.0100	16.22	0.9040	0.3710	46	-0.56	148.99	0
148	Total Sulfur (17%)	0360	15.72	0.1800	16.22	0.9040	0.3710	46	-0.55	148.00	0
148	Total Sulfur (17%)	0073	15.74	0.1300	16.22	0.9040	0.3710	46	-0.54	148.01	0
148	Total Sulfur (17%)	0444	15.82	0.0000	16.22	0.9040	0.3710	46	-0.44	148.01	0
148	Total Sulfur (17%)	0394	15.85	0.3000	16.22	0.9040	0.3710	46	-0.41	148.04	0
148	Total Sulfur (17%)	0485	15.85	0.3600	16.22	0.9040	0.3710	46	-0.41	148.01	0
148	Total Sulfur (17%)	0377	15.85	0.3600	16.22	0.9040	0.3710	46	-0.41	148.99	0
148	Total Sulfur (17%)	0029	15.88	0.0300	16.22	0.9040	0.3710	46	-0.38	148.01	0
148	Total Sulfur (17%)	0105	16.01	0.0000	16.22	0.9040	0.3710	46	-0.23	148.01	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder CS Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
148	Total Sulfur (17%)	0102	16.06	0.1300	16.22	0.9040	0.3710	46	-0.18	148.01	0
148	Total Sulfur (17%)	0157	16.10	0.4000	16.22	0.9040	0.3710	46	-0.13	148.00	0
148	Total Sulfur (17%)	0157	16.10	0.0000	16.22	0.9040	0.3710	46	-0.13	148.01	0
148	Total Sulfur (17%)	0354	16.15	0.0030	16.22	0.9040	0.3710	46	-0.08	148.99	0
148	Total Sulfur (17%)	0324	16.20	0.4000	16.22	0.9040	0.3710	46	-0.02	148.01	0
148	Total Sulfur (17%)	0482	16.55	0.7000	16.22	0.9040	0.3710	46	0.36	148.99	0
148	Total Sulfur (17%)	0307	16.59	0.2760	16.22	0.9040	0.3710	46	0.40	148.99	0
148	Total Sulfur (17%)	0526	16.75	0.1000	16.22	0.9040	0.3710	46	0.59	148.01	0
148	Total Sulfur (17%)	0483	16.80	0.6000	16.22	0.9040	0.3710	46	0.64	148.07	0
148	Total Sulfur (17%)	0519	16.81	0.0700	16.22	0.9040	0.3710	46	0.65	148.99	0
148	Total Sulfur (17%)	0506	17.00	1.000	16.22	0.9040	0.3710	46	0.86	148.99	0
148	Total Sulfur (17%)	0523	17.01	0.0700	16.22	0.9040	0.3710	46	0.87	148.99	0
148	Total Sulfur (17%)	0500	17.05	0.1000	16.22	0.9040	0.3710	46	0.92	148.01	0
148	Total Sulfur (17%)	0486	17.08	0.1600	16.22	0.9040	0.3710	46	0.95	148.07	0
148	Total Sulfur (17%)	0510	17.14	0.0324	16.22	0.9040	0.3710	46	1.02	148.01	0
148	Total Sulfur (17%)	0406	17.34	2.420	16.22	0.9040	0.3710	46	1.24	148.07	0
148	Total Sulfur (17%)	0102	17.59	0.5046	16.22	0.9040	0.3710	46	1.52	148.07	0
148	Total Sulfur (17%)	0525	17.80	1.060	16.22	0.9040	0.3710	46	1.75	148.07	0
148	Total Sulfur (17%)	0451	17.80	0.6000	16.22	0.9040	0.3710	46	1.75	148.00	0
148	Total Sulfur (17%)	0325	18.00	1.000	16.22	0.9040	0.3710	46	1.97	148.07	0
148	Total Sulfur (17%)	0513	18.05	0.1000	16.22	0.9040	0.3710	46	2.02	148.01	0
148	Total Sulfur (17%)	0515	19.44	3.008	16.22	0.9040	0.3710	46	3.56	148.07	0
148	Total Sulfur (17%)	0501	11.57*	6.013	16.22	0.9040	0.3710	46	-5.15	148.99	1
148	Total Sulfur (17%)	0292	31.17	0.0100	16.22	0.9040	0.3710	46	16.53	148.07	2
149	Sulfur - HNO3 soluble (%)	0368	16.15	0.5549	16.98	0.8890	0.2464	3	-0.93	149.04	0
149	Sulfur - HNO3 soluble (%)	0524	16.87	0.1844	16.98	0.8890	0.2464	3	-0.12	149.04	0
149	Sulfur - HNO3 soluble (%)	0521	17.92	0.0000	16.98	0.8890	0.2464	3	1.06	149.04	0
151	Acid Soluble Arsenic (ppm)	0523	0.0835	0.0090	0.9312	1.185	0.0297	3	-0.72	151.30	0
151	Acid Soluble Arsenic (ppm)	0519	0.4250	0.0100	0.9312	1.185	0.0297	3	-0.43	151.30	0
151	Acid Soluble Arsenic (ppm)	0368	2.285	0.0700	0.9312	1.185	0.0297	3	1.14	151.30	0
151	Acid Soluble Arsenic (ppm)	0515	0.0000	0.0000	0.9312	1.185	0.0297	3		151.33	4
151	Acid Soluble Arsenic (ppm)	0515	0.0000	0.0000	0.9312	1.185	0.0297	3		151.34	4
165	Acid Soluble Boron (%)	0521	0.0072	0.0000	0.0107	0.0049	0.0022	4	-0.72	165.30	0
165	Acid Soluble Boron (%)	0524	0.0086	0.0001	0.0107	0.0049	0.0022	4	-0.45	165.99	0
165	Acid Soluble Boron (%)	0117	0.0092	0.0006	0.0107	0.0049	0.0022	4	-0.31	165.99	0
165	Acid Soluble Boron (%)	0354	0.0180	0.0080	0.0107	0.0049	0.0022	4	1.48	165.30	0
181	Acid Soluble Cadmium (ppm)	0368	3.750	0.6200	4.960	0.6037	0.2909	15	-2.00	181.30	0
181	Acid Soluble Cadmium (ppm)	0481	4.240	0.2400	4.960	0.6037	0.2909	15	-1.19	181.00	0
181	Acid Soluble Cadmium (ppm)	0444	4.395	0.2100	4.960	0.6037	0.2909	15	-0.94	181.30	0
181	Acid Soluble Cadmium (ppm)	0523	4.545	0.2300	4.960	0.6037	0.2909	15	-0.69	181.30	0
181	Acid Soluble Cadmium (ppm)	0096	4.650	0.1000	4.960	0.6037	0.2909	15	-0.51	181.30	0
181	Acid Soluble Cadmium (ppm)	0524	4.672	0.0112	4.960	0.6037	0.2909	15	-0.48	181.30	0
181	Acid Soluble Cadmium (ppm)	0394	4.800	0.0000	4.960	0.6037	0.2909	15	-0.26	181.30	0

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			Value	Range	Rob Mean	Rob SD	R-bar				
181	Acid Soluble Cadmium (ppm)	0230	4.995	0.0700	4.960	0.6037	0.2909	15	0.06	181.34	0
181	Acid Soluble Cadmium (ppm)	0519	5.130	0.0600	4.960	0.6037	0.2909	15	0.28	181.30	0
181	Acid Soluble Cadmium (ppm)	0035	5.250	0.1600	4.960	0.6037	0.2909	15	0.48	181.30	0
181	Acid Soluble Cadmium (ppm)	0117	5.338	0.0560	4.960	0.6037	0.2909	15	0.63	181.33	0
181	Acid Soluble Cadmium (ppm)	0482	5.400	0.4000	4.960	0.6037	0.2909	15	0.73	181.30	0
181	Acid Soluble Cadmium (ppm)	0102	5.463	0.0160	4.960	0.6037	0.2909	15	0.83	181.30	0
181	Acid Soluble Cadmium (ppm)	0520	5.600	0.0000	4.960	0.6037	0.2909	15	1.06	181.99	0
181	Acid Soluble Cadmium (ppm)	0515	8.529	2.190	4.960	0.6037	0.2909	15	5.91	181.34	0
181	Acid Soluble Cadmium (ppm)	0515	6.037	2.701	4.960	0.6037	0.2909	15	1.78	181.33	1
191	Acid Soluble Chromium (ppm)	0482	7.850	0.7000	8.908	0.7080	0.6408	10	-1.39	191.30	0
191	Acid Soluble Chromium (ppm)	0117	7.971	0.2130	8.908	0.7080	0.6408	10	-1.23	191.33	0
191	Acid Soluble Chromium (ppm)	0096	8.700	2.000	8.908	0.7080	0.6408	10	-0.27	191.30	0
191	Acid Soluble Chromium (ppm)	0230	8.805	0.1500	8.908	0.7080	0.6408	10	-0.14	191.34	0
191	Acid Soluble Chromium (ppm)	0368	9.045	0.4700	8.908	0.7080	0.6408	10	0.18	191.30	0
191	Acid Soluble Chromium (ppm)	0519	9.095	0.0900	8.908	0.7080	0.6408	10	0.25	191.30	0
191	Acid Soluble Chromium (ppm)	0515	9.158	2.046	8.908	0.7080	0.6408	10	0.33	191.33	0
191	Acid Soluble Chromium (ppm)	0102	9.223	0.2090	8.908	0.7080	0.6408	10	0.41	191.30	0
191	Acid Soluble Chromium (ppm)	0035	9.275	0.0100	8.908	0.7080	0.6408	10	0.48	191.30	0
191	Acid Soluble Chromium (ppm)	0523	9.960	0.5200	8.908	0.7080	0.6408	10	1.38	191.30	0
191	Acid Soluble Chromium (ppm)	0515	13.39	4.748	8.908	0.7080	0.6408	10	5.89	191.34	1
202	Acid Soluble Cobalt (ppm)	0524	7.360	0.0182	8.441	1.048	0.4740	10	-0.96	202.30	0
202	Acid Soluble Cobalt (ppm)	0523	7.435	0.0500	8.441	1.048	0.4740	10	-0.89	202.30	0
202	Acid Soluble Cobalt (ppm)	0035	7.490	0.2000	8.441	1.048	0.4740	10	-0.84	202.30	0
202	Acid Soluble Cobalt (ppm)	0482	7.700	0.4000	8.441	1.048	0.4740	10	-0.66	202.30	0
202	Acid Soluble Cobalt (ppm)	0096	8.495	0.2900	8.441	1.048	0.4740	10	0.05	202.30	0
202	Acid Soluble Cobalt (ppm)	0520	8.600	0.0000	8.441	1.048	0.4740	10	0.14	202.99	0
202	Acid Soluble Cobalt (ppm)	0117	8.789	0.1480	8.441	1.048	0.4740	10	0.31	202.33	0
202	Acid Soluble Cobalt (ppm)	0102	9.062	0.0630	8.441	1.048	0.4740	10	0.55	202.30	0
202	Acid Soluble Cobalt (ppm)	0368	9.465	0.6700	8.441	1.048	0.4740	10	0.91	202.30	0
202	Acid Soluble Cobalt (ppm)	0515	12.73	2.901	8.441	1.048	0.4740	10	3.81	202.34	0
202	Acid Soluble Cobalt (ppm)	0515	12.39	4.862	8.441	1.048	0.4740	10	3.50	202.33	1
221	Acid Soluble Copper (%)	0433	0.0003	0.0001	0.0025	0.0037	0.0321	6	-0.55	221.30	0
221	Acid Soluble Copper (%)	0515	0.0005	0.0001	0.0025	0.0037	0.0321	6	-0.50	221.33	0
221	Acid Soluble Copper (%)	0521	0.0005	0.0000	0.0025	0.0037	0.0321	6	-0.49	221.32	0
221	Acid Soluble Copper (%)	0515	0.0009	0.0003	0.0025	0.0037	0.0321	6	-0.40	221.99	0
221	Acid Soluble Copper (%)	0354	0.0050	0.0020	0.0025	0.0037	0.0321	6	0.60	221.30	0
221	Acid Soluble Copper (%)	0368	0.5150	0.1900	0.0025	0.0037	0.0321	6	123.27	221.30	0
221	Acid Soluble Copper (%)	0394	1.320	0.4800	0.0025	0.0037	0.0321	6	316.91	221.32	1
241	Acid Soluble Iron (%)	0096	0.0300	0.0000	0.0342	0.0039	0.0012	9	-0.99	241.30	0
241	Acid Soluble Iron (%)	0482	0.0300	0.0000	0.0342	0.0039	0.0012	9	-0.99	241.30	0
241	Acid Soluble Iron (%)	0521	0.0317	0.0000	0.0342	0.0039	0.0012	9	-0.58	241.32	0
241	Acid Soluble Iron (%)	0524	0.0323	0.0004	0.0342	0.0039	0.0012	9	-0.44	241.99	0
241	Acid Soluble Iron (%)	0117	0.0334	0.0025	0.0342	0.0039	0.0012	9	-0.19	241.33	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder CS Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
241	Acid Soluble Iron (%)	0025	0.0363	0.0021	0.0342	0.0039	0.0012	9	0.50	241.33	0
241	Acid Soluble Iron (%)	0035	0.0373	0.0004	0.0342	0.0039	0.0012	9	0.75	241.30	0
241	Acid Soluble Iron (%)	0105	0.0375	0.0010	0.0342	0.0039	0.0012	9	0.80	241.00	0
241	Acid Soluble Iron (%)	0105	0.0390	0.0040	0.0342	0.0039	0.0012	9	1.15	241.03	0
241	Acid Soluble Iron (%)	0354	0.0205	0.0330	0.0342	0.0039	0.0012	9	-3.25	241.30	1
251	Acid Soluble Lead (ppm)	0519	0.0100	0.0000	3.627	5.122	2.198	8	-0.65	251.30	0
251	Acid Soluble Lead (ppm)	0524	0.4707	0.0290	3.627	5.122	2.198	8	-0.56	251.30	0
251	Acid Soluble Lead (ppm)	0523	0.5000	0.0400	3.627	5.122	2.198	8	-0.56	251.30	0
251	Acid Soluble Lead (ppm)	0394	0.7100	0.2600	3.627	5.122	2.198	8	-0.52	251.30	0
251	Acid Soluble Lead (ppm)	0481	1.570	0.0800	3.627	5.122	2.198	8	-0.37	251.00	0
251	Acid Soluble Lead (ppm)	0515	4.660	1.571	3.627	5.122	2.198	8	0.18	251.34	0
251	Acid Soluble Lead (ppm)	0515	10.13	7.942	3.627	5.122	2.198	8	1.16	251.33	0
251	Acid Soluble Lead (ppm)	0035	10.97	7.660	3.627	5.122	2.198	8	1.31	251.30	0
251	Acid Soluble Lead (ppm)	0368	0.0000	0.0000	3.627	5.122	2.198	8		251.30	4
261	Acid Soluble Manganese (%)	0521	0.1387	0.0000	0.1486	0.0077	0.0018	10	-1.18	261.34	0
261	Acid Soluble Manganese (%)	0524	0.1413	0.0006	0.1486	0.0077	0.0018	10	-0.87	261.99	0
261	Acid Soluble Manganese (%)	0096	0.1442	0.0034	0.1486	0.0077	0.0018	10	-0.52	261.30	0
261	Acid Soluble Manganese (%)	0117	0.1450	0.0019	0.1486	0.0077	0.0018	10	-0.43	261.35	0
261	Acid Soluble Manganese (%)	0354	0.1465	0.0010	0.1486	0.0077	0.0018	10	-0.25	261.30	0
261	Acid Soluble Manganese (%)	0035	0.1490	0.0000	0.1486	0.0077	0.0018	10	0.05	261.30	0
261	Acid Soluble Manganese (%)	0105	0.1500	0.0060	0.1486	0.0077	0.0018	10	0.17	261.12	0
261	Acid Soluble Manganese (%)	0025	0.1540	0.0028	0.1486	0.0077	0.0018	10	0.65	261.35	0
261	Acid Soluble Manganese (%)	0105	0.1570	0.0020	0.1486	0.0077	0.0018	10	1.01	261.15	0
261	Acid Soluble Manganese (%)	0482	0.1600	0.0000	0.1486	0.0077	0.0018	10	1.37	261.31	0
281	Acid Soluble Mercury (ppm)	0519	0.0605	0.0010				1		281.30	0
281	Acid Soluble Mercury (ppm)	0515	0.0000	0.0000				1		281.30	4
289	Acid Soluble Molybdenum (ppm)	0524	0.2880	0.0114	1.868	2.073	0.2062	6	-0.68	289.30	0
289	Acid Soluble Molybdenum (ppm)	0102	0.3605	0.0230	1.868	2.073	0.2062	6	-0.65	289.30	0
289	Acid Soluble Molybdenum (ppm)	0096	1.100	0.2000	1.868	2.073	0.2062	6	-0.33	289.30	0
289	Acid Soluble Molybdenum (ppm)	0433	1.405	0.0040	1.868	2.073	0.2062	6	-0.20	289.30	0
289	Acid Soluble Molybdenum (ppm)	0515	3.079	0.9990	1.868	2.073	0.2062	6	0.52	289.34	0
289	Acid Soluble Molybdenum (ppm)	0521	12.66	0.0000	1.868	2.073	0.2062	6	4.64	289.30	0
289	Acid Soluble Molybdenum (ppm)	0035	14.05	11.70	1.868	2.073	0.2062	6	5.23	289.30	1
289	Acid Soluble Molybdenum (ppm)	0368	0.0000	0.0000	1.868	2.073	0.2062	6		289.30	4
289	Acid Soluble Molybdenum (ppm)	0515	0.0385	0.0770	1.868	2.073	0.2062	6		289.33	4
291	Acid Soluble Nickel (ppm)	0394	73.40	5.200	91.65	10.43	2.542	17	-1.75	291.30	0
291	Acid Soluble Nickel (ppm)	0444	77.46	0.3200	91.65	10.43	2.542	17	-1.36	291.30	0
291	Acid Soluble Nickel (ppm)	0035	79.70	0.6000	91.65	10.43	2.542	17	-1.14	291.30	0
291	Acid Soluble Nickel (ppm)	0523	82.35	1.100	91.65	10.43	2.542	17	-0.89	291.30	0
291	Acid Soluble Nickel (ppm)	0482	84.10	4.400	91.65	10.43	2.542	17	-0.72	291.30	0
291	Acid Soluble Nickel (ppm)	0515	86.41	10.56	91.65	10.43	2.542	17	-0.50	291.33	0
291	Acid Soluble Nickel (ppm)	0481	88.31	1.670	91.65	10.43	2.542	17	-0.32	291.00	0
291	Acid Soluble Nickel (ppm)	0230	94.80	0.6000	91.65	10.43	2.542	17	0.30	291.34	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder CS Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
291	Acid Soluble Nickel (ppm)	0117	95.05	0.7800	91.65	10.43	2.542	17	0.33	291.33	0
291	Acid Soluble Nickel (ppm)	0368	95.18	9.980	91.65	10.43	2.542	17	0.34	291.30	0
291	Acid Soluble Nickel (ppm)	0096	96.60	1.000	91.65	10.43	2.542	17	0.47	291.30	0
291	Acid Soluble Nickel (ppm)	0521	97.29	0.0000	91.65	10.43	2.542	17	0.54	291.30	0
291	Acid Soluble Nickel (ppm)	0520	98.00	0.0000	91.65	10.43	2.542	17	0.61	291.99	0
291	Acid Soluble Nickel (ppm)	0515	98.21	4.940	91.65	10.43	2.542	17	0.63	291.34	0
291	Acid Soluble Nickel (ppm)	0524	99.22	1.044	91.65	10.43	2.542	17	0.73	291.30	0
291	Acid Soluble Nickel (ppm)	0102	102.0	0.9900	91.65	10.43	2.542	17	0.99	291.30	0
291	Acid Soluble Nickel (ppm)	0519	108.0	0.0300	91.65	10.43	2.542	17	1.56	291.30	0
301	Acid Soluble Selenium (ppm)	0524	1.080	0.0454	5.994	4.296	4.419	3	-1.14	301.30	0
301	Acid Soluble Selenium (ppm)	0515	7.863	13.17	5.994	4.296	4.419	3	0.43	301.33	0
301	Acid Soluble Selenium (ppm)	0519	9.040	0.0400	5.994	4.296	4.419	3	0.71	301.30	0
301	Acid Soluble Selenium (ppm)	0368	0.0000	0.0000	5.994	4.296	4.419	3		301.30	4
301	Acid Soluble Selenium (ppm)	0515	0.9370	1.874	5.994	4.296	4.419	3		301.34	4
311	Sodium (%)	0521	0.5121	0.0000	0.6539	0.0290	0.0229	6	-4.36	311.32	0
311	Sodium (%)	0025	0.6475	0.0102	0.6539	0.0290	0.0229	6	-0.20	311.32	0
311	Sodium (%)	0482	0.6500	0.0200	0.6539	0.0290	0.0229	6	-0.12	311.99	0
311	Sodium (%)	0035	0.6595	0.0050	0.6539	0.0290	0.0229	6	0.17	311.33	0
311	Sodium (%)	0096	0.6700	0.0400	0.6539	0.0290	0.0229	6	0.49	311.99	0
311	Sodium (%)	0354	0.6860	0.0620	0.6539	0.0290	0.0229	6	0.99	311.99	0
321	Acid Soluble Zinc (35%)	0292	15.50*	0.1300	33.27	2.230	0.4615	61	-7.97	321.30	0
321	Acid Soluble Zinc (35%)	0042	29.17*	2.010	33.27	2.230	0.4615	61	-1.84	321.99	0
321	Acid Soluble Zinc (35%)	0428	29.30*	0.2000	33.27	2.230	0.4615	61	-1.78	321.00	0
321	Acid Soluble Zinc (35%)	0482	30.00*	0.8000	33.27	2.230	0.4615	61	-1.47	321.30	0
321	Acid Soluble Zinc (35%)	0481	30.42*	0.2300	33.27	2.230	0.4615	61	-1.28	321.00	0
321	Acid Soluble Zinc (35%)	0117	30.47*	0.1100	33.27	2.230	0.4615	61	-1.26	321.33	0
321	Acid Soluble Zinc (35%)	0515	30.54*	1.344	33.27	2.230	0.4615	61	-1.23	321.33	0
321	Acid Soluble Zinc (35%)	0526	30.65*	0.5000	33.27	2.230	0.4615	61	-1.18	321.00	0
321	Acid Soluble Zinc (35%)	0405	30.80*	0.0000	33.27	2.230	0.4615	61	-1.11	321.99	0
321	Acid Soluble Zinc (35%)	0029	31.06*	1.480	33.27	2.230	0.4615	61	-0.99	321.00	0
321	Acid Soluble Zinc (35%)	0324	31.35*	0.5000	33.27	2.230	0.4615	61	-0.86	321.30	0
321	Acid Soluble Zinc (35%)	0200	31.38*	1.110	33.27	2.230	0.4615	61	-0.85	321.99	0
321	Acid Soluble Zinc (35%)	0025	31.47*	0.0500	33.27	2.230	0.4615	61	-0.81	321.33	0
321	Acid Soluble Zinc (35%)	0233	31.49*	0.5900	33.27	2.230	0.4615	61	-0.80	321.30	0
321	Acid Soluble Zinc (35%)	0105	31.69*	0.3100	33.27	2.230	0.4615	61	-0.71	321.03	0
321	Acid Soluble Zinc (35%)	0307	31.69*	0.2600	33.27	2.230	0.4615	61	-0.71	321.30	0
321	Acid Soluble Zinc (35%)	0231	31.79*	0.1600	33.27	2.230	0.4615	61	-0.67	321.30	0
321	Acid Soluble Zinc (35%)	0513	32.03*	0.0500	33.27	2.230	0.4615	61	-0.56	321.00	0
321	Acid Soluble Zinc (35%)	0043	32.06*	0.0800	33.27	2.230	0.4615	61	-0.54	321.00	0
321	Acid Soluble Zinc (35%)	0105	32.12*	0.1000	33.27	2.230	0.4615	61	-0.52	321.00	0
321	Acid Soluble Zinc (35%)	0040	32.13*	0.0600	33.27	2.230	0.4615	61	-0.51	321.00	0
321	Acid Soluble Zinc (35%)	0371	32.35	1.100	33.27	2.230	0.4615	61	-0.41	321.30	0
321	Acid Soluble Zinc (35%)	0433	32.39	0.4600	33.27	2.230	0.4615	61	-0.40	321.30	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder CS Z Score	Your Method	Flag
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321	Acid Soluble Zinc (35%)	0096	32.41	0.8200	33.27	2.230	0.4615	61	-0.39	321.30	0
321	Acid Soluble Zinc (35%)	0494	32.42	0.0500	33.27	2.230	0.4615	61	-0.38	321.33	0
321	Acid Soluble Zinc (35%)	0177	32.49	0.1127	33.27	2.230	0.4615	61	-0.35	321.33	0
321	Acid Soluble Zinc (35%)	0157	32.60	1.000	33.27	2.230	0.4615	61	-0.30	321.30	0
321	Acid Soluble Zinc (35%)	0420	32.61	1.200	33.27	2.230	0.4615	61	-0.30	321.30	0
321	Acid Soluble Zinc (35%)	0073	32.74	0.0500	33.27	2.230	0.4615	61	-0.24	321.30	0
321	Acid Soluble Zinc (35%)	0377	32.91	0.1500	33.27	2.230	0.4615	61	-0.17	321.30	0
321	Acid Soluble Zinc (35%)	0095	33.43	0.0000	33.27	2.230	0.4615	61	0.07	321.30	0
321	Acid Soluble Zinc (35%)	0368	33.44	0.2277	33.27	2.230	0.4615	61	0.07	321.30	0
321	Acid Soluble Zinc (35%)	0444	33.68	0.1300	33.27	2.230	0.4615	61	0.18	321.30	0
321	Acid Soluble Zinc (35%)	0523	33.73	0.3800	33.27	2.230	0.4615	61	0.20	321.99	0
321	Acid Soluble Zinc (35%)	0034	33.86	0.0500	33.27	2.230	0.4615	61	0.26	321.33	0
321	Acid Soluble Zinc (35%)	0230	34.00	0.0000	33.27	2.230	0.4615	61	0.33	321.30	0
321	Acid Soluble Zinc (35%)	0422	34.01	0.0000	33.27	2.230	0.4615	61	0.33	321.30	0
321	Acid Soluble Zinc (35%)	0354	34.26	0.0260	33.27	2.230	0.4615	61	0.44	321.30	0
321	Acid Soluble Zinc (35%)	0394	34.30	2.000	33.27	2.230	0.4615	61	0.46	321.32	0
321	Acid Soluble Zinc (35%)	0524	34.60	0.1020	33.27	2.230	0.4615	61	0.60	321.99	0
321	Acid Soluble Zinc (35%)	0360	34.64	0.5500	33.27	2.230	0.4615	61	0.61	321.30	0
321	Acid Soluble Zinc (35%)	0390	34.72	0.3700	33.27	2.230	0.4615	61	0.65	321.30	0
321	Acid Soluble Zinc (35%)	0472	34.76	0.3100	33.27	2.230	0.4615	61	0.66	321.30	0
321	Acid Soluble Zinc (35%)	0521	34.77	0.0000	33.27	2.230	0.4615	61	0.67	321.32	0
321	Acid Soluble Zinc (35%)	0090	34.87	0.0500	33.27	2.230	0.4615	61	0.71	321.30	0
321	Acid Soluble Zinc (35%)	0519	34.90	0.0100	33.27	2.230	0.4615	61	0.73	321.99	0
321	Acid Soluble Zinc (35%)	0055	34.95	0.1600	33.27	2.230	0.4615	61	0.75	321.30	0
321	Acid Soluble Zinc (35%)	0500	35.10	0.2000	33.27	2.230	0.4615	61	0.82	321.00	0
321	Acid Soluble Zinc (35%)	0486	35.11	0.0600	33.27	2.230	0.4615	61	0.82	321.33	0
321	Acid Soluble Zinc (35%)	0457	35.29	0.9100	33.27	2.230	0.4615	61	0.90	321.00	0
321	Acid Soluble Zinc (35%)	0389	35.30	0.6000	33.27	2.230	0.4615	61	0.91	321.99	0
321	Acid Soluble Zinc (35%)	0508	35.43	0.0100	33.27	2.230	0.4615	61	0.96	321.99	0
321	Acid Soluble Zinc (35%)	0520	35.50	0.0000	33.27	2.230	0.4615	61	1.00	321.99	0
321	Acid Soluble Zinc (35%)	0506	35.55	0.1000	33.27	2.230	0.4615	61	1.02	321.99	0
321	Acid Soluble Zinc (35%)	0325	35.65	1.100	33.27	2.230	0.4615	61	1.07	321.33	0
321	Acid Soluble Zinc (35%)	0485	35.69	0.7500	33.27	2.230	0.4615	61	1.08	321.00	0
321	Acid Soluble Zinc (35%)	0027	36.09	0.5950	33.27	2.230	0.4615	61	1.26	321.99	0
321	Acid Soluble Zinc (35%)	0501	36.43	1.674	33.27	2.230	0.4615	61	1.42	321.99	0
321	Acid Soluble Zinc (35%)	0035	38.75	2.300	33.27	2.230	0.4615	61	2.46	321.30	0
321	Acid Soluble Zinc (35%)	0516	39.33	0.3820	33.27	2.230	0.4615	61	2.71	321.00	0
321	Acid Soluble Zinc (35%)	0234	42.20	0.0900	33.27	2.230	0.4615	61	4.00	321.30	0
321	Acid Soluble Zinc (35%)	0483	26.30*	3.200	33.27	2.230	0.4615	61	-3.13	321.30	1
321	Acid Soluble Zinc (35%)	0515	32.62	4.122	33.27	2.230	0.4615	61	-0.29	321.99	1
325	Water Soluble Zinc (%)	0231	29.04	0.9700	31.41	1.744	0.3734	13	-1.36	325.30	0
325	Water Soluble Zinc (%)	0200	29.89	0.1200	31.41	1.744	0.3734	13	-0.87	325.99	0
325	Water Soluble Zinc (%)	0117	30.15	0.2500	31.41	1.744	0.3734	13	-0.73	325.30	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder CS Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
325	Water Soluble Zinc (%)	0394	30.15	0.3000	31.41	1.744	0.3734	13	-0.72	325.30	0
325	Water Soluble Zinc (%)	105	30.65	0.3800	31.41	1.744	0.3734	13	-0.44	325	0
325	Water Soluble Zinc (%)	368	31.00	0.2448	31.41	1.744	0.3734	13	-0.23	325.3	0
325	Water Soluble Zinc (%)	27	31.34	0.4090	31.41	1.744	0.3734	13	-0.04	325	0
325	Water Soluble Zinc (%)	25	31.42	1.160	31.41	1.744	0.3734	13	0.00	325.3	0
325	Water Soluble Zinc (%)	485	31.59	0.5000	31.41	1.744	0.3734	13	0.10	325	0
325	Water Soluble Zinc (%)	487	32.20	0.0000	31.41	1.744	0.3734	13	0.45	325.99	0
325	Water Soluble Zinc (%)	406	32.92	0.2000	31.41	1.744	0.3734	13	0.86	325.3	0
325	Water Soluble Zinc (%)	230	34.00	0.0000	31.41	1.744	0.3734	13	1.48	325.3	0
325	Water Soluble Zinc (%)	444	35.02	0.3200	31.41	1.744	0.3734	13	2.07	325.3	0
325	Water Soluble Zinc (%)	501	36.71	2.045	31.41	1.744	0.3734	13	3.04	325.3	1

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 and a 4 flag indicates rejected due to 0 value submitted. Robust statistics not used if < 6 labs used in calculations, in this case the Z Scores are included for information only (Grey). An offset lab value with an astrix indicates that the value is lower than the Analyte value less the IA. Method or Analyte codes in light green indicate a guaranteed analyte. Individual lab values may be below detection limits but are reported solely for the purpose of this Proficiency Testing program.