

AFPC Rock Check Program

Sample No. 2009-12

	Method #	# of Anal.	Grand Median	Std Dev
Moisture				
Ground Sample AFPC 9-2	101	20	0.82	0.095
Other (describe)	102	10	0.89	0.030
Method Group 100		30	0.86	0.07
BPL or P₂O₅				
Gravimetric AFPC 9-5	201	3	28.50	0.110
ICP-induced coupled plasma	202	4	28.54	0.213
Photometric-AFPC 9-6	203	17	28.51	0.190
Automated -AOAC 978.01-15th	204	13	28.50	0.116
Other(describe)	205	3	28.70	0.116
Method Group 200		40	28.51	0.14
BPL or P₂O₅ (on Dry Basis)				
Gravimetric AFPC 9-5	211	2	28.81	0.124
ICP-induced coupled plasma	212	4	28.77	0.216
Photometric-AFPC 9-6	213	10	28.75	0.170
Automated -AOAC 978.01-15th	214	13	28.74	0.090
Other(describe)	215	1	28.96	0.000
Method Group 210		30	28.75	0.13
Fe₂O₃				
Atomic Absorption-AFPC 9-12,13	301	5	0.69	0.104
ICP-induced coupled plasma	302	30	0.71	0.235
Other(describe)	303	2	0.70	0.035
Method Group 300		37	0.71	0.22
Al₂O₃				
Atomic Absorption-AFPC 9-16,17	401	3	0.87	0.174
ICP-induced coupled plasma	402	31	0.96	0.091
Other(describe)	403	1	1.82	0.000
Method Group 400		35	0.96	0.11
MgO				
Atomic Absorption-AFPC 9-18,19	501	5	0.26	0.030
ICP-induced coupled plasma	502	30	0.26	0.015
Other(describe)	503	2	0.30	0.024
Method Group 500		37	0.26	0.02
Acid Insoluble				
Insoluble-AFPC 9-8	601	19	8.89	0.345
Other(describe)	602	3	8.66	0.914
Method Group 600		22	8.89	0.38
CaO				
Gravimetric sulfate	701			
ICP-induced coupled plasma	702	16	46.05	0.395
Ceric Sulfate volumetric	703	1	47.33	0.000
Permanganate	704	5	45.95	0.366
EDTA Volumetric	705	6	46.23	0.702
Other(describe)	706	10	46.19	0.671
Method Group 700		38	46.13	0.56
CaO (on Dry Basis)				
Gravimetric sulfate	711			
ICP-induced coupled plasma	712	11	46.40	0.216
Ceric Sulfate volumetric	713			
Permanganate	714	4	46.42	0.144
EDTA Volumetric	715	5	46.78	0.399
Other(describe)	716	9	46.57	0.629
Method Group 710		29	46.44	0.43

	Method #	# of Anal.	Grand Median	Std Dev
Fluorine, F				
Volumetric-AFPC 9-37	801	1	3.13	0.000
Specific Ion Electrode	802	22	3.24	0.057
Other (describe)	803	3	3.31	0.049
Method Group 800		26	3.24	0.07
Arsenic, As				
Atomic Absorption	911			
ICP-induced coupled plasma	912	4	8.5	1.81
Other(describe)	913	2	4.4	0.30
Method Group 900		6	6.5	2.89
Cadmium, Cd				
Atomic Absorption	921	1	2	0.0
ICP-induced coupled plasma	922	13	19	1.9
Other(describe)	923	3	21	3.8
Method Group 910		17	19	3.0
Cobalt, Co				
Atomic Absorption	931			
ICP-induced coupled plasma	932	9	1	0.4
Other(describe)	933	3	8	2.4
Method Group 920		12	1	0.5
Mercury, Hg				
Atomic Absorption	941			
ICP-induced coupled plasma	942	1	19.0	0.00
Other(describe)	943			
Method Group 930		1	19.0	0.00
Molybdenum, Mo				
Atomic Absorption	951			
ICP-induced coupled plasma	952	9	4	0.4
Other(describe)	953	2	15	7.4
Method Group 940		11	4	0.5
Nickel, Ni				
Atomic Absorption	961	1	46	0.0
ICP-induced coupled plasma	962	11	17	2.2
Other(describe)	963	3	20	10.8
Method Group 950		15	20	2.6
Lead, Pb				
Atomic Absorption	971	1	23	0.0
ICP-induced coupled plasma	972	9	5	3.0
Other(describe)	973	2	9	2.1
Method Group 960		12	7	5.0
Selenium, Se				
Atomic Absorption	981			
ICP-induced coupled plasma	982	2	4	0.9
Other(describe)	983	1	5	0.0
Method Group 970		3	5	0.9
Zinc, Zn				
Atomic Absorption	991	2	62	35
ICP-induced coupled plasma	992	12	126	9
Other(describe)	993	3	125	7
Method Group 980		17	124	15

101 Ground Sample AFPC 9-2			
Lab	%	H ₂ O	
35	1.08		-2.733
27	1.06		-2.522
51	0.97		-1.576
Std Dev	0.92		-1.000
50	0.90		-0.841
10	0.89		-0.683
16	0.87		-0.525
49	0.87		-0.525
6	0.85		-0.315
16	0.84		-0.210
15	0.82		0.000
Median	0.82		0.000
15	0.82		0.000
10	0.80		0.210
75	0.80		0.210
30	0.76		0.631
24	0.76		0.683
Std Dev	0.72		1.000
24	0.72		1.051
266	0.70		1.261
75	0.62		2.102
77	0.55		2.838
77	0.50		3.363

102 Other (describe)			
Lab	%	H ₂ O	
9	1.04		-5.025
69	1.03		-4.690
21	0.92		-1.005
26	0.92		-1.005
Std Dev	0.92		-1.000
9	0.89		0.000
13	0.89		0.000
Median	0.89		0.000
13	0.88		0.335
21	0.88		0.335
Std Dev	0.86		1.000
6	0.85		1.340
33	0.83		2.010

201 Gravimetric AFPC 9-5			
Lab	%	P2O5	
21	28.70		-1.772
Std Dev	28.61		-1.000
77	28.50		0.000
Median	28.50		0.000
241	28.40		0.908

202 ICP-induced coupled plasma			
Lab	%	P2O5	
10	28.67		-0.599
10	28.60		-0.270
Median	28.54		0.000
6	28.48		0.270
Std Dev	28.32		1.000
266	27.87		3.138

203 Photometric-AFPC 9-6			
Lab	%	P2O5	
35	29.09		-3.048
237	29.07		-2.943
270	28.86		-1.839
69	28.84		-1.734
Std Dev	28.70		-1.000
9	28.70		-0.972
60	28.55		-0.210
26	28.54		-0.131
9	28.52		-0.053
30	28.51		0.000
Median	28.51		0.000
92	28.50		0.053
16	28.48		0.158
16	28.47		0.210
78	28.44		0.368
78	28.43		0.420
92	28.40		0.578
33	28.35		0.841
Std Dev	28.32		1.000
27	27.73		4.099

204 Automated -AOAC 978.01-15th			
Lab	%	P2O5	
75	28.65		-1.297
Std Dev	28.62		-1.000
75	28.60		-0.865
21	28.60		-0.821

21	28.56		-0.475
24	28.55		-0.389
6	28.51		-0.086
24	28.50		0.000
Median	28.50		0.000
13	28.49		0.086
13	28.48		0.173
50	28.40		0.865
15	28.39		0.951
77	28.39		0.951
15	28.39		0.994

205 Other(describe)			
Lab	%	P2O5	
49	28.71		-0.086
19	28.70		0.000
Median	28.70		0.000
Std Dev	28.58		1.000
51	28.40		2.594

211 Gravimetric AFPC 9-5			
Lab	%	P2O5	dB
51	28.98		-1.340
Std Dev	28.93		-1.000
Median	28.81		0.000
Std Dev	28.69		1.000
77	28.64		1.340

212 ICP-induced coupled plasma			
Lab	%	P2O5	dB
10	28.92		-0.676
10	28.83		-0.235
Median	28.77		0.000
6	28.72		0.235
Std Dev	28.56		1.000
266	28.07		3.277

213 Photometric-AFPC 9-6			
Lab	%	P2O5	dB
35	29.41		-3.865
69	29.14		-2.288
9	29.00		-1.441
Std Dev	28.92		-1.000
26	28.80		-0.282

9	28.78		-0.141
Median	28.75		0.000
30	28.73		0.141
16	28.72		0.183
16	28.72		0.191
33	28.59		0.973
Std Dev	28.58		1.000
27	28.03		4.277

214 Automated -AOAC 978.01-15th			
Lab	%	P2O5	dB
75	28.88		-1.536
21	28.86		-1.307
Std Dev	28.83		-1.000
21	28.81		-0.729
75	28.78		-0.395
6	28.75		-0.128
24	28.75		-0.101
13	28.74		0.000
Median	28.74		0.000
13	28.74		0.080
24	28.72		0.291
50	28.66		0.945
Std Dev	28.65		1.000
15	28.62		1.315
15	28.62		1.371
77	28.55		2.179

215 Other(describe)			
Lab	%	P2O5	dB
49	28.96		0.000
Median	28.96		0.000

301 Atomic Absorption-AFPC 9-12,13			
Lab	%	Fe2O3	
33	0.75		-0.574
30	0.74		-0.479
241	0.69		0.000
Median	0.69		0.000
60	0.60		0.861
Std Dev	0.59		1.000
27	0.39		2.919

302 ICP-induced coupled plasma		
Lab	%	Fe2O3
50	0.88	-0.723
26	0.82	-0.447
77	0.81	-0.425
77	0.81	-0.425
35	0.79	-0.336
78	0.79	-0.319
266	0.78	-0.298
78	0.78	-0.277
51	0.74	-0.128
270	0.73	-0.085
75	0.72	-0.043
15	0.72	-0.043
15	0.72	-0.021
75	0.71	-0.009
6	0.71	0.000
92	0.71	0.000
Median	0.71	0.000
92	0.70	0.043
237	0.67	0.170
Std Dev	0.47	1.000
9	0.47	1.042
9	0.46	1.063
49	0.46	1.063
10	0.46	1.085
10	0.45	1.106
16	0.45	1.127
16	0.44	1.149
13	0.43	1.191
24	0.43	1.212
21	0.42	1.255
21	0.41	1.276
13	0.41	1.276

303 Other(describe)		
Lab	%	Fe2O3
69	0.75	-1.340
Std Dev	0.73	-1.000
Median	0.70	0.000
Std Dev	0.66	1.000
19	0.65	1.340

401 Atomic Absorption-AFPC 9-16,17		
Lab	%	Al2O3
30	1.06	-1.095
Std Dev	1.04	-1.000
241	0.87	0.000
Median	0.87	0.000
Std Dev	0.70	1.000
27	0.60	1.585

402 ICP-induced coupled plasma		
Lab	%	Al2O3
78	2.13	-12.798
78	1.99	-11.212
266	1.90	-10.282
77	1.87	-9.954
77	1.86	-9.845
24	1.09	-1.422
Std Dev	1.05	-1.000
237	1.03	-0.711
21	1.02	-0.602
9	1.01	-0.492
21	1.01	-0.492
15	0.97	-0.109
75	0.97	-0.096
9	0.97	-0.055
15	0.96	0.000
26	0.96	0.000
49	0.96	0.000
Median	0.96	0.000
75	0.96	0.054
6	0.92	0.438
16	0.92	0.492
16	0.91	0.602
10	0.89	0.766
92	0.89	0.766
270	0.89	0.766
10	0.89	0.820
Std Dev	0.87	1.000
69	0.87	1.039
92	0.85	1.203
35	0.84	1.313
51	0.83	1.477
50	0.82	1.531
13	0.80	1.750

502 ICP-induced coupled plasma		
Lab	%	MgO
50	1.11	-57.747
237	1.07	-54.690
92	0.33	-4.756
92	0.31	-3.397
26	0.30	-2.378
78	0.29	-1.698
266	0.28	-1.359
Std Dev	0.27	-1.000
9	0.27	-0.679
49	0.27	-0.679
9	0.27	-0.340
15	0.27	-0.340
16	0.27	-0.340
24	0.27	-0.340
6	0.26	0.000
10	0.26	0.000
10	0.26	0.000
13	0.26	0.000
15	0.26	0.000
16	0.26	0.000
69	0.26	0.000
78	0.26	0.000
Median	0.26	0.000
75	0.25	0.604
13	0.25	0.679

403 Other(describe)		
Lab	%	Al2O3
19	1.82	0.000
Median	1.82	0.000

501 Atomic Absorption-AFPC 9-18,19		
Lab	%	MgO
30	0.33	-2.345
35	0.30	-1.340
Std Dev	0.29	-1.000
33	0.26	0.000
241	0.26	0.000
Median	0.26	0.000
60	0.24	0.670

601 Insoluble-AFPC 9-8		
Lab	%	Al
15	9.54	-1.883
15	9.54	-1.883
6	9.43	-1.565
26	9.39	-1.434
Std Dev	9.24	-1.000
69	9.16	-0.782
16	9.08	-0.536
9	9.04	-0.420
16	9.01	-0.333
9	8.89	0.000
13	8.89	0.000
Median	8.89	0.000
10	8.89	0.014
24	8.89	0.014
13	8.80	0.261
10	8.75	0.406
33	8.56	0.956
Std Dev	8.54	1.000
24	8.53	1.058
21	8.45	1.275
35	8.12	2.231
21	8.09	2.332

602 Other(describe)		
Lab	%	Al
77	0.25	0.679
77	0.25	0.679
75	0.25	0.903
Std Dev	0.25	1.000
51	0.25	1.019
21	0.24	1.698
21	0.23	2.378
270	0.16	6.794

503 Other(describe)		
Lab	%	MgO
19	0.33	-1.340
Std Dev	0.32	-1.000
Median	0.30	0.000
Std Dev	0.27	1.000
27	0.27	1.340

602 Other(describe)		
Lab	%	Al
75	0.25	0.604
13	0.25	0.679

27	11.07	-2.636
Std Dev	9.57	-1.000
266	8.66	0.000
Median	8.66	0.000
19	8.62	0.044

701 Gravimetric sulfate			
Lab	%	CaO	
Median	0.00		0.000

702 ICP-induced coupled plasma			
Lab	%	CaO	

78	47.34	-3.270
78	47.23	-2.979
75	46.69	-1.623
49	46.46	-1.040
Std Dev	46.44	-1.000
92	46.28	-0.584
77	46.22	-0.432
77	46.18	-0.331
75	46.11	-0.151
Median	46.05	0.000
92	45.99	0.151
10	45.99	0.163
10	45.85	0.518
16	45.81	0.620
6	45.77	0.708
16	45.73	0.810
Std Dev	45.65	1.000
237	45.00	2.660
69	42.40	9.249

703 Ceric Sulfate volumetric			
Lab	%	CaO	
241	47.33		0.000
Median	47.33		0.000

704 Permanganate			
Lab	%	CaO	
21	46.15		-0.547
30	46.04		-0.246
27	45.95		0.000
Median	45.95		0.000
Std Dev	45.58		1.000

21	45.55	1.094
60	44.75	3.282

705 EDTA Volumetric			
Lab	%	CaO	

26	49.54	-4.716
Std Dev	46.93	-1.000
266	46.78	-0.787
9	46.30	-0.096
Median	46.23	0.000
9	46.16	0.096
35	45.57	0.936
Std Dev	45.53	1.000
270	45.41	1.164

706 Other(describe)			
Lab	%	CaO	

19	46.50	-0.462
24	46.40	-0.313
24	46.37	-0.261
51	46.34	-0.224
15	46.19	0.000
15	46.19	0.000
Median	46.19	0.000
Std Dev	45.52	1.000
13	45.46	1.088
33	45.46	1.088
13	45.45	1.103
50	44.30	2.818

711 Gravimetric sulfate				
Lab	%	CaO		dB
Median	0.00			0.000

712 ICP-induced coupled plasma				
Lab	%	CaO		dB

75	46.98	-2.717
49	46.87	-2.190
Std Dev	46.61	-1.000
75	46.48	-0.395
77	46.45	-0.263
77	46.44	-0.185
10	46.40	0.000
Median	46.40	0.000

10	46.21	0.839
16	46.19	0.940
Std Dev	46.18	1.000
6	46.16	1.082
16	46.13	1.226
69	42.84	16.489

713 Ceric Sulfate volumetric				
Lab	%	CaO		dB
Median	0.00			0.000

714 Permanganate				
Lab	%	CaO		dB

21	46.58	-1.117
Std Dev	46.56	-1.000
27	46.44	-0.172
Median	46.42	0.000
30	46.39	0.172
Std Dev	46.27	1.000
21	45.95	3.210

715 EDTA Volumetric				
Lab	%	CaO		dB

26	50.00	-8.057
Std Dev	47.18	-1.000
266	47.11	-0.822
9	46.78	0.000
Median	46.78	0.000
9	46.57	0.518
Std Dev	46.38	1.000
35	46.07	1.787

716 Other(describe)				
Lab	%	CaO		dB

51	46.79	-0.353
24	46.75	-0.288
24	46.70	-0.206
15	46.57	0.000
15	46.57	0.000
Median	46.57	0.000
Std Dev	45.94	1.000
13	45.86	1.126
13	45.86	1.134
33	45.84	1.162

50	44.70	2.971	
801 Volumetric-AFPC 9-37			
Lab	%	Fluorine, F	
33	3.13		0.000
Median	3.13		0.000

802 Specific Ion Electrode			
Lab	%	Fluorine, F	

69	3.48	-4.086
30	3.40	-2.768
24	3.40	-2.680
24	3.33	-1.538
9	3.32	-1.274
Std Dev	3.30	-1.000
266	3.28	-0.659
9	3.28	-0.571
6	3.26	-0.308
13	3.25	-0.132
27	3.25	-0.132
270	3.25	-0.132
Median	3.24	0.000
21	3.24	0.132
75	3.23	0.220
35	3.22	0.395
75	3.22	0.483
51	3.21	0.571
13	3.20	0.747
21	3.20	0.835
Std Dev	3.19	1.000
49	3.13	1.977
15	3.09	2.680
15	3.09	2.768
50	3.05	3.383

803 Other(describe)			
Lab	%	Fluorine, F	

77	3.35	-0.825
19	3.31	0.000
Median	3.31	0.000
Std Dev	3.26	1.000
77	3.22	1.855

911 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Arsenic, As	
Median	0.0	0.000	

912 ICP-induced coupled plasma			
Lab	ppm	Arsenic, As	
78	<1	0.000	
78	<1	0.000	
69	11.4	-1.630	
Std Dev	10.3	-1.000	
270	9.0	-0.304	
Median	8.5	0.000	
266	7.9	0.304	
6		1.906	

913 Other(describe)			
Lab	ppm	Arsenic, As	
13	4.8	-1.340	
Std Dev	4.7	-1.000	
Median	4.4	0.000	
Std Dev	4.1	1.000	
19	4.0	1.340	

921 Atomic Absorption-AFPC 9-12,13			
Lab	ppm	Cadmium, Cd	
27	2	0.000	
Median	2	0.000	

922 ICP-induced coupled plasma			
Lab	ppm	Cadmium, Cd	
78	25	-3.144	
78	23	-2.036	
51	21	-1.031	
Std Dev	21	-1.000	
26	21	-0.773	
77	20	-0.515	
270	20	-0.350	
75	19	0.000	
75	19	0.000	
77	19	0.000	
Median	19	0.000	
266	18	0.567	
Std Dev	17	1.000	
6	17	1.031	

237	16	1.546
50	2	8.762

923 Other(describe)			
Lab	ppm	Cadmium, Cd	
19	26	-1.249	
Std Dev	25	-1.000	
13	21	0.000	
Median	21	0.000	
Std Dev	17	1.000	
69	16	1.431	

931 Atomic Absorption-AFPC 9-16,17			
Lab	ppm	Cobalt, Co	
Median	0	0.000	

932 ICP-induced coupled plasma			
Lab	ppm	Cobalt, Co	
78	2	-2.680	
75	2	-1.340	
78	2	-1.340	
Std Dev	1	-1.000	
266	1	-0.804	
75	1	0.000	
77	1	0.000	
77	1	0.000	
Median	1	0.000	
237	1	0.804	
Std Dev	1	1.000	
270	0	2.680	

933 Other(describe)			
Lab	ppm	Cobalt, Co	
69	8	-0.021	
27	8	0.000	
Median	8	0.000	
Std Dev	5	1.000	
13	1	2.659	

941 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Mercury, Hg	
Median	0.0	0.000	

942 ICP-induced coupled plasma			
Lab	ppm	Mercury, Hg	
266	19.0	0.000	
Median	19.0	0.000	

943 Other(describe)			
Lab	ppm	Mercury, Hg	
69	<0.5	0.000	
13	<0.07	0.000	
Median		0.000	

951 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Molybdenum, Mo	
Median	0	0.000	

952 ICP-induced coupled plasma			
Lab	ppm	Molybdenum, Mo	
78	5	-3.484	
266	5	-1.501	
51	5	-1.340	
Std Dev	4	-1.000	
78	4	-0.670	
77	4	0.000	
77	4	0.000	
270	4	0.000	
Median	4	0.000	
Std Dev	4	1.000	
237	4	1.072	
6	3	2.680	

953 Other(describe)			
Lab	ppm	Molybdenum, Mo	
69	25	-1.340	
Std Dev	22	-1.000	
Median	15	0.000	
Std Dev	7	1.000	
13	5	1.340	

961 Atomic Absorption-AFPC 9-12,13			
Lab	ppm	Nickel, Ni	
27	46	0.000	
Median	46	0.000	

962 ICP-induced coupled plasma			
Lab	ppm	Nickel, Ni	
266	32	-6.655	
270	20	-1.340	
51	20	-1.117	
78	20	-1.117	
Std Dev	19	-1.000	
237	19	-0.670	
6	17	0.000	
75	17	0.000	
Median	17	0.000	
75	17	0.223	
78	17	0.223	
77	16	0.447	
77	15	0.893	

963 Other(describe)			
Lab	ppm	Nickel, Ni	
19	49	-2.668	
Std Dev	31	-1.000	
13	20	0.000	
Median	20	0.000	
69	20	0.012	

971 Atomic Absorption-AFPC 9-16,17			
Lab	ppm	Lead, Pb	
27	23	0.000	
Median	23	0.000	

972 ICP-induced coupled plasma			
Lab	ppm	Lead, Pb	
26	13	-2.680	
266	10	-1.776	
270	8	-1.005	
Std Dev	8	-1.000	
78	7	-0.670	
6	5	0.000	
Median	5	0.000	
77	4	0.335	
77	4	0.335	
237	4	0.419	
Std Dev	2	1.000	
78	2	1.173	

973 Other(describe)		
Lab	ppm	Lead, Pb
69	12	-1.340
Std Dev	11	-1.000
Median	9	0.000
Std Dev	7	1.000
13	6	1.340

75	124	0.212
237	124	0.212
6	123	0.318
51	120	0.690
Std Dev	117	1.000
77	108	1.910
77	106	2.123

981 Atomic Absorption-AFPC 9-18,19		
Lab	ppm	Selenium, Se
Median	0	0.000

993 Other(describe)		
Lab	ppm	Zinc, Zn
13	127	-0.268
69	125	0.000
Median	125	0.000
Std Dev	118	1.000
19	107	2.412

982 ICP-induced coupled plasma		
Lab	ppm	Selenium, Se
266	5	-1.340
Std Dev	5	-1.000
Median	4	0.000
Std Dev	3	1.000
270	3	1.340

983 Other(describe)		
Lab	ppm	Selenium, Se
69	<0.5	0.000
13	5	0.000
Median	5	0.000

991 Atomic Absorption-AFPC 9-18,19		
Lab	ppm	Zinc, Zn
60	109	-1.340
Std Dev	97	-1.000
Median	62	0.000
Std Dev	27	1.000
27	16	1.340

992 ICP-induced coupled plasma		
Lab	ppm	Zinc, Zn
270	262	-14.435
24	146	-2.070
266	140	-1.486
Std Dev	135	-1.000
78	133	-0.743
78	130	-0.371
75	128	-0.212
Median	126	0.000