

Table 1**Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur, S	Pyritic Sulfur, S	Sulfate Sulfur, S	Total Sulfur, S
		ton CaCO ₃ per kton soil	weight %	weight %	weight %	weight %			
IH020 330-335	Quartzite	-52.8	63.8	52.8	-0.3	0.14	1.69	0.21	2.04
IH020 285-295	Quartzite	-79.1	85.6	79.1	-0.3	0.05	2.53	0.16	2.74
IH020 340-350	Quartzite	-6.6	9.7	6.6	-0.3	0.01	0.21	0.09	0.31
IH149 198-206	Quartzite	-0.6	0.6	0.6	-0.2	-0.01	0.02	-0.01	0.02
IH149 128-138	Andesite	8.3	-0.3	-0.3	8.3	-0.01	-0.01	-0.01	-0.01
IH149 181-186	Andesite	-2.2	3.4	2.2	-0.3	0.01	0.07	0.03	0.11

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- One sample is considered non acid generating IH149 128-138

Table 2 **Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur, S	Pyritic Sulfur, S	Sulfate Sulfur, S	Total Sulfur, S
		ton CaCO ₃ per kton soil	weight %	weight %	weight %	weight %			
IH209 1016-1026	Quartzite	-24.8	37.50	27.5	2.7	0.02	0.88	0.3	1.2
IH209 1040-1050	Quartzite	-1.7	11.88	9.4	7.7	0.01	0.3	0.07	0.38
IH208 514-522.4	Quartzite	-42.2	124.38	42.2	-0.3	2.18	1.35	0.45	3.98
IH208 530-537	Argillite	-50.3	172.81	50.3	-0.3	3.43	1.61	0.49	5.53
IH208 547.9-556	Argillite	-11.6	18.75	11.9	-0.3	0.07	0.38	0.15	0.6
IH157 1016-1026	Quartzite	-2	5.31	3.4	1.5	0.02	0.11	0.04	0.17
IH112 308-318	Quartzite	-63.8	83.44	63.8	-0.3	0.05	2.04	0.58	2.67
IH083 587-596	Quartzite	-81.6	182.19	81.6	-0.3	2.52	2.61	0.7	5.83
IH083 596-605.7	Siltite	-93.4	135.00	93.4	-0.3	0.83	2.99	0.5	4.32
IH070 695-705	Quartzite	-44.7	59.06	44.7	-0.3	0.04	1.43	0.42	1.89
IH059 641-651	Argillite	-33.4	44.06	33.4	-0.3	0.06	1.07	0.28	1.41
IH059 651-661	Argillite	-44.4	56.25	44.4	-0.3	0.1	1.42	0.28	1.8
IH057 528-538	Quartzite	-12.6	21.88	12.8	-0.3	0.1	0.41	0.19	0.7
IH013 700-710	Siltite	-50.4	101.56	50.9	0.5	1.05	1.63	0.57	3.25
IH013 690-700	Quartzite	-42.8	72.19	42.8	-0.3	0.5	1.37	0.44	2.31

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 3 Results of ABA Testing

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur,S	Pyritic Sulfur,S	Sulfate Sulfur,S	Total Sulfur, S
		ton CaCO ₃ kiloton soil	weight %	weight %	weight %	weight %			
BH-01 740-745	quartzite	-45.1	53.8	49.1	3.98	0.05	1.57	0.1	1.72
BH-01 745-750	siltite	-19.1	27.8	22.8	3.73	0.04	0.73	0.12	0.89
BH-01 750-755	siltite	-13.3	16.6	13.8	0.5	0.04	0.44	0.05	0.53
BH-01 755-760	quartzite	-11.5	16.3	13.4	1.99	0.04	0.43	0.05	0.52
BH-01 760-765	quartzite	-20.9	25.6	21.9	0.99	0.05	0.7	0.07	0.82
BH-01 765-770	siltite	-16.5	22.2	18.4	1.99	0.04	0.59	0.08	0.71
BH-01 770-775	siltite	-20.4	25.3	23.1	2.73	0.05	0.74	0.02	0.81

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 4 **Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur, S	Pyritic Sulfur, S	Sulfate Sulfur, S	Total Sulfur, S
		ton CaCO ₃ per kton soil	weight %	weight %	weight %	weight %			
BH-02 650-655	siltite	-43.1	48.75	44.4	1.24	0.1	1.42	0.04	1.56
BH-02 660-665	siltite	-48.2	63.75	53.1	4.96	0.08	1.7	0.26	2.04
BH-02 665-670	quartzite	-19.1	23.13	19.4	-0.3	0.03	0.62	0.09	0.74
BH-02 675-680	quartzite	-24.2	31.25	25.9	1.74	0.07	0.83	0.1	1
BH-02 670-675	quartzite	-21.5	29.38	25.9	4.47	0.05	0.83	0.06	0.94
BH-02 680-685	siltite	-56.8	66.25	60	3.23	0.12	1.92	0.08	2.12
BH-02 655-660	siltite	-33.2	47.81	35.6	2.48	0.08	1.14	0.31	1.53

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 5 **Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur, S	Pyritic Sulfur, S	Sulfate Sulfur, S	Total Sulfur, S
		ton CaCO ₃ per kton soil	weight %	weight %	weight %	weight %			
BH-03 600-605	quartzite	-30.3	35.6	30.3	-0.3	0.04	0.97	0.13	1.14
BH-03 605-610	quartzite	-20	34.7	20	-0.3	0.41	0.64	0.06	1.11
BH-03 610-615	quartzite	-15.9	28.1	15.9	-0.3	0.33	0.51	0.06	0.9
BH-03 615-620	quartzite	-15.9	16.9	15.9	-0.3	0.03	0.51	-0.01	0.54
BH-03 620-625	quartzite	-49.7	59.7	49.7	-0.3	0.22	1.59	0.1	1.91
BH-03 625-630	quartzite	-26.2	39.4	29.7	3.49	0.16	0.95	0.15	1.26
BH-03 630-635	quartzite	-16.4	25.0	16.9	0.5	0.17	0.54	0.09	0.8

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 6 **Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur,S	Pyritic Sulfur,S	Sulfate Sulfur,S	Total Sulfur, S
		ton CaCO ₃ kiloton soil	weight %	weight %	weight %	weight %			
BH-04 610-615	quartzite	-21.8	41.25	22.8	0.99	0.42	0.73	0.17	1.32
BH-04 615-620	quartzite	-28.4	55.94	28.4	-0.3	0.72	0.91	0.16	1.79
BH-04 620-625	quartzite	-15.8	50.94	19.1	3.23	0.95	0.61	0.07	1.63
BH-04 625-630	quartzite	-7.51	30.00	8.75	1.24	0.45	0.28	0.23	0.96
BH-04 630-635	quartzite	-29.5	44.06	32.5	2.98	0.28	1.04	0.09	1.41
BH-04 635-640	quartzite	-19.9	28.13	20.6	0.74	0.13	0.66	0.11	0.9
BH-04 640-645	quartzite	-50.6	63.75	52.8	2.23	0.12	1.69	0.23	2.04

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 7**Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur, S	Pyritic Sulfur, S	Sulfate Sulfur, S	Total Sulfur, S
		ton CaCO ₃ per kton soil	weight %	weight %	weight %	weight %			
BH-05 510-515	siltite	-71.2	92.8	79.7	8.48	0.25	2.55	0.17	2.97
BH-05 515-520	siltite	-69.6	79.4	74.1	4.49	0.12	2.37	0.05	2.54
BH-05 520-525	siltite	-63.1	72.2	63.1	-0.3	0.07	2.02	0.22	2.31
BH-05 525-530	siltite	-73.8	80.9	73.8	-0.3	0.07	2.36	0.16	2.59
BH-05 530-535	siltite	-63.5	73.4	63.8	-0.3	0.07	2.04	0.24	2.35
BH-05 535-540	siltite	-83.2	92.8	83.4	-0.3	0.08	2.67	0.22	2.97
BH-05 540-545	siltite	-95.9	108.4	95.9	-0.3	0.1	3.07	0.3	3.47

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 8**Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur, S	Pyritic Sulfur, S	Sulfate Sulfur, S	Total Sulfur, S
		ton CaCO ₃ per kton soil	weight %	weight %	weight %	weight %			
BH-06 400-405	quartzite	-22.2	24.7	22.2	-0.3	0.02	0.71	0.06	0.79
BH-06 405-410	quartzite	-26.6	38.1	26.6	-0.3	0.17	0.85	0.2	1.22
BH-06 410-415	quartzite	-16.6	26.3	16.6	-0.3	0.13	0.53	0.18	0.84
BH-06 415-420	quartzite	-42.5	64.4	42.5	-0.3	0.26	1.36	0.44	2.06
BH-06 420-425	quartzite	-7.44	13.4	9.69	2.25	0.02	0.31	0.1	0.43
BH-06 425-430	quartzite	-10.9	20.6	16.9	5.99	0.05	0.54	0.07	0.66
BH-06 430-435	quartzite	-12.2	18.1	12.2	-0.3	0.01	0.39	0.18	0.58

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 9**Results of ABA Testing**

Sample Site Depth Interval (ft)	Rock Type	ABP	AGP (total sulfur)	AGP (pyritic sulfur)	ANP	Non-Extractable Sulfur, S	Pyritic Sulfur, S	Sulfate Sulfur, S	Total Sulfur, S
		ton CaCO ₃ per kton soil	weight %	weight %	weight %	weight %			
BH-08 945-950	quartzite	-19.9	32.8	27.5	7.62	0.02	0.88	0.15	1.05
BH-08 950-955	siltite	-24.4	37.5	30	5.65	-0.01	0.96	0.24	1.2
BH-08 955-960	siltite	-31	45.3	38.1	7.13	0.02	1.22	0.21	1.45
BH-08 960-965	quartzite	-48.3	63.8	55.6	7.37	0.02	1.78	0.24	2.04
BH-08 965-970	quartzite	-41.9	55.0	46.6	4.67	0.02	1.49	0.25	1.76
BH-08 970-975	quartzite	-29.7	42.8	36.6	6.88	-0.01	1.17	0.19	1.37
BH-08 975-980	quartzite	-21.3	37.5	29.7	8.36	0.02	0.95	0.23	1.2
BH-08 980-985	quartzite	-63.2	83.4	73.8	10.6	0.03	2.36	0.28	2.67

Acid Base Potential (ABP) = Acid Neutralizing Potential (ANP) - Acid Generating Potential (AGP) note: if ANP is less than 0, use 0

AGP = weight percent of sulfur x conversion factor (31.25)

Acid Neutralizing Potential (ANP) is determined using the modified Sobek method

NDEP Requirements:

1. If the ANP exceeds the total sulfur by 20% then material is considered non acid generating and no further testing is required, if not go to #2
 2. If the ANP exceeds the pyritic sulfur by 20% then material is considered non acid generating and no further testing is required, if not proceed with kinetic testing
- All samples are considered acid generating:

Table 10
ABP Summary, Rock Type Sorting

Sample Site Units	Rock Type	ABP ton CaCO ₃ / kiloton soil	Pyritic Sulfur,S weight %
IH020 330-335	Quartzite	-52.8	1.69
IH020 285-295	Quartzite	-79.1	2.53
IH020 340-350	Quartzite	-6.6	0.21
IH149 198-206	Quartzite	-0.6	0.02
IH149 128-138	Andesite	8.3	-0.01
IH149 181-186	Andesite	-2.2	0.07
IH209 1016-1026	Quartzite	-24.8	0.88
IH209 1040-1050	Quartzite	-1.7	0.3
IH208 514-522,4	Quartzite	-42.2	1.35
IH208 530-537	Argillite	-50.3	1.61
IH208 547.9-556	Argillite	-11.6	0.38
IH157 1016-1026	Quartzite	-2	0.11
IH112 308-318	Quartzite	-63.8	2.04
IH083 587-596	Quartzite	-81.6	2.61
IH083 596-605,7	Siltite	-93.4	2.99
IH070 695-705	Quartzite	-44.7	1.43
IH059 641-651	Argillite	-33.4	1.07
IH059 651-661	Argillite	-44.4	1.42
IH057 528-538	Quartzite	-12.6	0.41
IH013 700-710	Siltite	-50.4	1.63
IH013 690-700	Quartzite	-42.8	1.37
BH-01 740-745	Quartzite	-45.1	1.57
BH-01 745-750	Siltite	-19.1	0.73
BH-01 750-755	Siltite	-13.3	0.44
BH-01 755-760	Quartzite	-11.5	0.43
BH-01 760-765	Quartzite	-20.9	0.7
BH-01 765-770	Siltite	-16.5	0.59
BH-01 770-775	Siltite	-20.4	0.74
BH-02 650-655	siltite	-43.1	1.42
BH-02 660-665	siltite	-48.2	1.7
BH-02 665-670	quartzite	-19.1	0.62
BH-02 675-680	quartzite	-24.2	0.83
BH-02 670-675	quartzite	-21.5	0.83
BH-02 680-685	siltite	-56.8	1.92
BH-02 655-660	siltite	-33.2	1.14
BH-03 600-605	quartzite	-30.3	0.97
BH-03 605-610	quartzite	-20	0.64
BH-03 610-615	quartzite	-15.9	0.51
BH-03 615-620	quartzite	-15.9	0.51
BH-03 620-625	quartzite	-49.7	1.59
BH-03 625-630	quartzite	-26.2	0.95
BH-03 630-635	quartzite	-16.4	0.54
BH-04 610-615	quartzite	-21.8	0.73
BH-04 615-620	quartzite	-28.4	0.91
BH-04 620-625	quartzite	-15.8	0.61
BH-04 625-630	quartzite	-7.51	0.28
BH-04 630-635	quartzite	-29.5	1.04
BH-04 635-640	quartzite	-19.9	0.66
BH-04 640-645	quartzite	-50.6	1.69
BH-05 510-515	siltite	-71.2	2.55
BH-05 515-520	siltite	-69.6	2.37
BH-05 520-525	siltite	-63.1	2.02
BH-05 525-530	siltite	-73.8	2.36
BH-05 530-535	siltite	-63.5	2.04
BH-05 535-540	siltite	-83.2	2.67
BH-05 540-545	siltite	-95.9	3.07
BH-06 400-405	quartzite	-22.2	0.06
BH-06 405-410	quartzite	-26.6	0.2
BH-06 410-415	quartzite	-16.6	0.18
BH-06 415-420	quartzite	-42.5	0.44
BH-06 420-425	quartzite	-7.44	0.1
BH-06 425-430	quartzite	-10.9	0.07
BH-06 430-435	quartzite	-12.2	0.18
BH-08 945-950	quartzite	-19.9	0.88
BH-08 950-955	siltite	-24.4	0.96
BH-08 955-960	siltite	-31	1.22
BH-08 960-965	quartzite	-48.3	1.78
BH-08 965-970	quartzite	-41.9	1.49
BH-08 970-975	quartzite	-29.7	1.17
BH-08 975-980	quartzite	-21.3	0.95
BH-08 980-985	quartzite	-63.2	2.36

Table 11
Statistics by Rock Type

Rock type	Number of Occurrences	Mean Pyritic Sulfur, S weight %	Mean ABP ton CaCO ₃ / kiloton soil
Andesite	2	0.03	3.05
Argillite	4	1.12	-34.93
Quartzite	46	0.90	-28.65
Siltite	19	1.71	-51.06