E-TEMPLATE
OVERBURDEN ANALYSIS REPORT
08/2021

Provide data and interpretation of overburden analysis. The plan for material placement (e.g., alkaline redistribution) should be provided in the Special Handling section of Operations. The overburden analysis report must include at a minimum:

1. Completed geologic logs of overburden analysis test holes logged by a professional geologist (P.G.) <use/link to Geologic Drill Log template> including Munsell color codes. Holes should be surveyed and shown on Environmental Resources Map.

   OB-4 was used to determine the overburden quality associated with the Upper Freeport coal seam. Rosebud Mining Company is requesting an overburden waiver for the Lower Freeport, Upper Kittanning and Middle Kittanning coal seams; since surface mining was successfully conducted in these coal seams at the adjacent Mine 78 Surface Mine Permit No. 56080104. Rosebud will utilize the same alkaline addition rates defined in Module 10 of the permit application (copy attached below). The remainder of this section applies to the Upper Freeport overburden area only.

2. Explain how you determined the following:

   - drill hole spacing and number of holes,

     The spacing, number and location of overburden test holes were determined by first evaluating and determining the proposed mine plan. The UF excavation area consists of approximately 5.2 acres. Due to the limited excavation area, one drill hole located above the proposed highwall was deemed adequate to evaluate the overburden material.

   - sampling depth

     The overburden hole was drilled to intercept all rock units that would be encountered for the extraction of the Upper Freeport coal seam. The test pit intercepted the soils and near surface material to a depth of 77'. The upper 18' of the drill hole were not used in the evaluation of overburden quality because these stratagraphic units will not be encountered during mining.

   - sampling intervals of overburden analysis test holes.

     Overburden samples from test hole drilled using standard air rotary methods were collected in composite samples of the same lithologic unit at intervals not exceeding one foot in depth. These rock cuttings (rock chips) are placed in labeled "Ziploc" plastic bags and sealed. The sampling is continuous throughout the entire depth of the overburden hole.

     The following table lists the Department's required maximum thicknesses to be tested for certain lithotypes. Lithotypes are not to be combined.

LITHOTYPES	MAXIMUM COLUMN THICKNESS (FT)
Sandstone*	3
Limestone or calcareous deposits	3
Mudstone or claystone	3
Coal**	3
Mine spoil	5
Tipple refuse	5
Glacial till or outwash	5
Unspecified unconsolidated deposits	5

*** Channel sandstone with coal inclusions should be tested separately.**
**** Strata within 1 foot above and below the coal should be tested separately**

3. Cross-sections. A series of stratigraphic cross-sections or fence diagrams including all overburden analysis test holes, plus other representative test holes. Show stratigraphic correlations between overburden holes and other test holes and hydrogeologic information (such as water table, perched systems, etc.). The vertical scale must be sufficient to show all potentially acidic and alkaline zones and any zones proposed for special handling; a scale of one (1) inch to twenty (20) feet or greater is recommended.

   Given the small area to be excavated and limited amount of alkaline/acidic material in the overburden hole, Rosebud requests the waiver of a cross-section.

4. Results of the chemical analysis of all overburden strata, coals and strata immediately below the coal.

   The chemical analysis of the overburden strata, coal and underlying strata is presented in Form 7.1b for OB-6.

5. Acid-base accounting data. This can be shown on Geologic Drill Log sheet. Submission of the laboratory analysis sheets is also recommended. Forms of sulfur (when submitted) should be submitted on a separate sheet.

   The acid-base accounting data is shown on Form 7.1b for OB-6.

6. Techniques and methods of chemical analyses. References pertaining to technique or method should be cited (e.g. Sobek, and others 1978, p.47-50; ASTM Method D2492-84). Where a standard method is not used or has been modified, describe the method used in detail.

   Overburden samples for the drill hole were delivered to G&C Coal Analysis Lab., Inc. (G&C) for analysis. The samples were analyzed for total sulfur, fizz rating, and neutralization potential. G&C forwarded overburden analysis reports to Rosebud Mining Company once completed. The lab reported that the samples were prepared and analyzed according to procedures found in Noll et.al. (1988), "Overburden Sampling and Testing Manual". The results from the analytical reports provided by the lab are presented on Form 7.1b for each drill hole

7. Interpretation. Identify all stratigraphic units possessing the potential for significant acid or alkaline production and provide an overall interpretation of the overburden analysis data. Explain fully the criterion and rationale by which the overburden is being assessed.

   The alkaline zones associated with the mining area, includes the following zones:

   - **69.0-72.0 – a shale unit**

   The potentially acidic strata associated with the mining area, includes the following zones:

   - **60.0-63.0 – a shale unit**
     72.0-73.0 – a shale unit
     73.0-76.0 – Upper Freeport coal seam

   Overburden analysis data were evaluated for the purposes of this report using a computer spreadsheet model similar to that described by Smith and Brady (1990). Items entered into the spreadsheet model include the lithologic interval and rock type, analytical laboratory data (lab sample ID #, fizz rating, sulfur weight %, neutralization potential (NP)), and bottom area of each overburden volume. The exact overburden volume for each stratagraphic unit was determined by analyzing the pit volumes using an AutoCAD volume report program. The Overburden Analysis Spreadsheet is provided below.

   Mining of the Upper Freeport coal to a highwall of 60 feet may generate an alkaline excess, exhibiting a net NP of 2.70 without thresholds and 0.35 with thresholds. Alkaline addition in the amount of 111 tons per acre is required to meet a net NP of 4.00 with thresholds since the site is located in a CWF watershed along a stream that does not support aquatic life.

   One half of the alkaline addition rate will be applied to the floor of the Upper Freeport coal seam. The remaining half will be placed immediately below the topsoil cap on the spoil backfill. Material used for alkaline addition will be unprocessed Harsco AgrowSil ("Rec-Mix") which typically has a calcium carbonate equivalency of 103%.

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: OB-4
Surface Elevation: 2061.5
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1985.5
Static Water Elevations and Date Measured: Not Recorded
Surveyed by: RMC **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 04/14/20
Drilled By: Holt Drilling
Logged By: Holt Drilling
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: G&C Coal Analysis Lab., Inc.
Grid Coordinates Northing 332,346 Easting 1,675,576
Latitude: 40° 14' 27.16" **Longitude:** 78° 47' 57.48"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
XXXXXXXXXXXX XXXXXXXXXXXX	2.0	2.0		Fill			1	0-3	0.03	None	-0.70
////////////////////////	3.0	1.0		Clay, Brown							
							2	3-6	0.01	None	-0.81
							3	6-9	0.00	None	0.59
			10				4	9-12	0.00	None	-0.14
				Sandstone, Brown			5	12-15	0.00	None	-0.34
							6	15-18	0.00	None	0.22
			20				7	18-21	0.00	None	7.84
	24.0	21.0					8	21-24	0.00	None	8.31
==========							9	24-27	0.00	None	1.38
==========							10	27-30	0.00	None	1.46
==========			30	Shale, Brown							
==========							11	30-33	0.00	None	1.35
==========	34.0	10.0									
				Sandstone, Brown			12	33-36	0.01	None	0.42
							13	36-39	0.00	None	3.29
			40				14	39-42	0.05	None	1.97
				Sandstone, Gray			15	42-45	0.04	None	0.73
							16	45-48	0.05	None	-0.39
				Sandstone, Brown							
			50				17	48-51	0.02	None	-0.17
					Water @ 52' 2-3 gpm		18	51-54	0.03	None	-0.03
				Sandstone, Gray			19	54-57	0.13	None	-0.03
							20	57-60	0.15	None	0.98
			60								
	62.0	28.0					21	60-63	0.99	None	10.47
==========							22	63-66	0.46	None	11.49
==========				Shale, Gray							
==========							23	66-69	0.22	None	25.90
==========			70				24	69-72	0.05	Slight	36.09
==========	73.0	11.0		Shale, Dark			25	72-73	0.74	None	10.73
	76.0	3.0		Upper Freeport Coal (E) - 36.0"			26	73-76	3.47	None	-1.54
							27	76-77	0.06	None	11.71
			80	Sandstone, Gray			28	77-80	0.39	None	5.50

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

Rosebud Mining Company
Mine 78 Surface No. 3 Mine
08/2021

GEOLOGIC LOG DRILL HOLES/OVERBURDEN ANALYSIS DATA

Hole No.: OB-4
Surface Elevation: 2061.5
Bottom of Coal Elevations: Upper Freeport Coal (E) - 1985.5

Static Water Elevations and Date Measured: Not Recorded

Surveyed by: RMC **Method:** Rotary Air
Remarks: None

Operation Name : Mine 78 Surface No. 3 Mine
Method of Drilling: Rotary Air
Date Drilled: 04/14/20
Drilled By: Holt Drilling
Logged By: Holt Drilling
Township: Paint
County: Somerset
Quadrangle: Windber
Laboratory: G&C Coal Analysis Lab., Inc.
Grid Coordinates Northing 332,346 Easting 1,675,576
Latitude: 40° 14' 27.16" **Longitude:** 78° 47' 57.48"

Graphic Log	Depth	Thickness	Scale 1" = 10'	Lithologic Description: rock type, weathering, color, fossils, carbonate minerals concentrations, pyrite, etc.	Water Conditions	Overburden Analysis Logs					
						Munsell Color Code	OBA Sample	Log Interval	% Total Sulfur	Fizz Rating	NP
	81.0	5.0		Sandstone, Gray			29	80-81	0.28	None	4.97
			90								
			100								
			110								
			120								
			130								
			140								
			150								
			160								

OVERBURDEN ANALYSIS SPREADSHEET

OPERATOR Rosebud Mining Company
PERMIT NO.
DRILL HOLE OB-6

COUNTY Somerset
TWP Paint

ALK ADD (t/a CaCO3)	111
LATITUDE	40° 14' 27.16"
LONGITUDE	78° 47' 57.48"
COAL SEAMS	Upper Freeport
STATE PLANE ZONE	South
FEET (NORTH/SOUTH)	
FEET (EAST/WEST)	
SURFACE ELEV. (feet)	2061.5
STATIC WATER (feet)	ND

CARBONOLITH	cb	2580	
CLAY	cl	3450	
COAL	co	1800	
LIMESTONE	lm	3670	
OTHER, SPOIL	ot	3670	
SANDSTONE	ss	3670	
SHALE	sh	3700	
SILTSTONE	st	3750	
SOIL	so	2000	
TILL	ti	3600	

THRESHOLD	VALUES		SULFUR	NP	FIZZ
			0.5	30	1

TOTAL DEPTH 77 ACREAGE

TOP 0 BOTTOM 15.6

/Thrs = Using Thresholds

BOTTOM DEPTH (feet)	BOTTOM ELEV. (feet)		THICK (feet)	ROCK TYPE	COAL SEAM	DRILL LOG *	SULFUR (percent)	FIZZ	NP (t / 1000t)	Volume (Acre/Ft)	UNIT WT. (t /acre-ft)	SPOILED (percent)	MPA/Thrs (tons)	MPA (tons)	NP/Thrs (tons)	NP (tons)	NNP/Thrs (tons)	NNP (tons)	OVRBRDN (tons)
3.00	2058.50	TOO HIGH	3.00	SO			0.030	0	-0.70	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00	2055.50	TOO HIGH	3.00	SS			0.010	0	-0.81	0.00	3670	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00	2052.50	TOO HIGH	3.00	SS			0.000	0	0.59	0.00	3670	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12.00	2049.50	TOO HIGH	3.00	SS			0.000	0	-0.14	0.00	3670	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	2046.50	TOO HIGH	3.00	SS			0.000	0	-0.34	0.00	3670	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18.00	2043.50	TOO HIGH	3.00	SS			0.000	0	0.22	0.00	3670	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.00	2037.50		6.00	SS			0.000	0	7.84	0.69	3670	1.00	0.00	0.00	0.00	19.82	0.00	19.82	2,527.55
27.00	2034.50		3.00	SS			0.000	0	8.31	1.45	3670	1.00	0.00	0.00	0.00	44.11	0.00	44.11	5,307.85
30.00	2031.50		3.00	SH			0.000	0	1.38	2.13	3700	1.00	0.00	0.00	0.00	10.90	0.00	10.90	7,899.45
33.00	2028.50		3.00	SH			0.000	0	1.46	2.82	3700	1.00	0.00	0.00	0.00	15.25	0.00	15.25	10,447.66
36.00	2025.50		3.00	SS			0.100	0	1.35	3.55	3670	1.00	0.00	40.74	0.00	17.60	0.00	-23.14	13,036.37
39.00	2022.50		3.00	SS			0.000	0	0.42	4.27	3670	1.00	0.00	0.00	0.00	6.58	0.00	6.58	15,670.80
42.00	2019.50		3.00	SS			0.050	0	3.29	5.03	3670	1.00	0.00	28.83	0.00	60.70	0.00	31.87	18,451.10
45.00	2016.50		3.00	SS			0.040	0	1.97	6.53	3670	1.00	0.00	29.94	0.00	47.19	0.00	17.25	23,952.56
48.00	2013.50		3.00	SS			0.050	0	0.73	7.23	3670	1.00	0.00	41.47	0.00	19.37	0.00	-22.09	26,539.26
51.00	2010.50		3.00	SS			0.020	0	-0.17	7.99	3670	1.00	0.00	18.32	0.00	-4.98	0.00	-23.31	29,319.56
54.00	2007.50		3.00	SS			0.030	0	-0.03	8.75	3670	1.00	0.00	30.09	0.00	-0.96	0.00	-31.06	32,099.86
57.00	2004.50		3.00	SS			0.130	0	-0.03	9.56	3670	1.00	0.00	142.60	0.00	-1.05	0.00	-143.65	35,100.87
60.00	2001.50		3.00	SS			0.150	0	0.98	10.33	3670	1.00	0.00	177.72	0.00	37.15	0.00	-140.56	37,913.22
63.00	1998.50		3.00	SH			0.990	0	10.47	11.02	3700	1.00	1261.36	1261.36	0.00	426.88	-1261.36	-834.49	40,771.35
66.00	1995.50		3.00	SH			0.460	0	11.49	12.60	3700	1.00	0.00	670.25	0.00	535.73	0.00	-134.52	46,626.13
69.00	1992.50		3.00	SH			0.220	0	25.90	13.09	3700	1.00	0.00	332.86	0.00	1253.97	0.00	921.11	48,415.98
72.00	1989.50		3.00	SH			0.050	1	36.09	15.15	3700	1.00	0.00	87.59	2023.23	2023.23	2023.23	1935.63	56,060.61
73.00	1988.50		1.00	SH			0.740	0	10.73	5.17	3700	1.00	442.36	442.36	0.00	205.25	-442.36	-237.10	19,129.00
76.00	1985.50		3.00	CO	UF		3.470	0	-1.54	15.66	1800	0.05	152.83	152.83	0.00	-2.17	-152.83	-155.00	1,409.40
77.00	1984.50		1.00	SS			0.060	0	11.74	5.22	3670	0.10	0.00	3.59	0.00	22.49	0.00	18.90	1,915.74
													1856.55	3460.56	3754.83	6468.66	1898.27	3008.10	474,325.91
													3.91	7.30	7.92	13.64	4.00	6.34	

TOTAL (TONS):
TOTAL (TONS/THOUSAND):

* Drill log is not to scale

OVERBURDEN ANALYSIS SPREAD SHEET CALCULATION SUMMARY

OPERATOR	Rosebud Mining Company	COUNTY	Somerset	COAL SEAMS: Upper Freeport
PERMIT NO.		TOWNSHIP	Paint	
DRILL HOLE	OB-6			

TOTAL DEPTH	TOP ACREAGE	BOTTOM ACREAGE
77.0	0.0	15.60

THRESHOLD VALUES		
SULFUR	NP	FIZZ
0.5	30	1

MPA, NP or NNP/Thrs = Using Thresholds

	MPA/Thrs (tons)	MPA (tons)	NP/Thrs (tons)	NP (tons)	NNP/Thrs (tons)	NNP (tons)	Overburden (total tons)
TOTAL (TONS):	1857	3461	3755	6469	1898	3008	474326
TOTAL (TONS/THOUSAND):	3.91	7.30	7.92	13.64	4.00	6.34	

With Thresholds @ 31.25

MPA (Total Tons)	1857	Tons/1000 tons	3.91
NP (Total Tons)	3755	Tons/1000 tons	7.92
Net Tons NP	1898	Tons/1000 tons	4.00
NP/MPA Ratio	2.02		
Available NP (NNP=0)	**122**	**EXCESS**	
NNP=**1** (0.10%)	91	NNP=**4** (0.40%)	0
NNP=**1.5** (0.15%)	76	NNP=**4.5** (0.45%	-15
NNP=**2** (0.20%)	61	NNP=**5** (0.50%)	-30
NNP=**2.5** (0.25%)	46	NNP=**5.5** (0.55%	-46
NNP=**3** (0.30%)	30	NNP=**6** (0.60%)	-61
NNP=**3.5** (0.35%)	15		

Without Thresholds @ 31.25

MPA (Total Tons)	3461	Tons/1000 tons	7.30
NP (Total Tons)	6469	Tons/1000 tons	13.64
Net Tons NP	3008	Tons/1000 tons	6.34
NP/MPA Ratio	1.87		
Available NP (NNP=0)	**193**	**EXCESS**	
NNP=**1** (0.1%)	162	NNP=**7** (0.7%)	-20
NNP=**2** (0.2%)	132	NNP=**8** (0.8%)	-50
NNP=**3** (0.3%)	102	NNP=**9** (0.9%)	-81
NNP=**4** (0.4%)	71	NNP=**10** (1.0%)	-111
NNP=**5** (0.5%)	41	NNP=**11** (1.1%)	-142
NNP=**6** (0.6%)	10	NNP=**12** (1.2%)	-172

With Thresholds @ 62.50

MPA (Total Tons)	3713	Tons/1000 tons	7.83
NP (Total Tons)	3754.83	Tons/1000 tons	7.92
Net Tons NP	42	Tons/1000 tons	0.09
NP/MPA Ratio	1.01		
Available NP (Tons per acre)	**3**	**EXCESS**	

Without Thresholds @ 62.50

MPA (Total Tons)	6921	Tons/1000 tons	14.59
NP (Total Tons)	6469	Tons/1000 tons	13.64
Net Tons NP	-452	Tons/1000 tons	-0.95
NP/MPA Ratio	0.93		
Available NP (Tons per acre)	**29**	**DEFICIENT**	

A summary of alkaline addition rates for the Upper Freeport coal seam and other coal seams as identified in Module 10 of Mine 78 Surface Mine Permit No. 56080104 are:

Coal Seam	Alkaline Addition Rate (Tons/Acre)	Source
Upper Freeport	111	OB-4
Lower Freeport	160	Module 10 – SMP 56080104, Phase 2
Upper Kittanning	55	Module 10 – SMP 56080104, Phase 1
Middle Kittanning	430	Module 10 – SMP 56080104, Phase 1

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10.8 Special Handling of Potentially Acid-Forming, Toxic-Forming, and Alkaline-Producing Material

a) Identify the stratigraphic and areal extent, and amount (thickness, tons, and/or cubic yards) of acid, toxic, and alkaline materials that will be special handled. The amount of coal and boney material that would be spoiled must be accurately determined. This may include the top and bottom of a coal interval and any partings. Identify the amount, chemical characteristics, and location of spoil to be placed above and below the special handled material.

Any associated binder or rooster in the Clarion (CL), Lower Kittanning (LK), Middle Kittanning (MK), Upper Kittanning (UK), Lower Freeport (LF), Upper Freeport (UF) coal seams.

The potentially acidic zones for the Clarion coal seam are:

The Rider coal seam approximately 30 feet above the coal seam, where the overburden is between 20-40 feet, the maximum highwall height.

One foot of shale immediately above the coal seam.

The potentially acidic zones for the Lower Kittanning coal seam are:

The first one-foot increment of clay that underlies the coal is potentially acidic Phase I only.

The potentially acidic zones for the Middle Kittanning coal seam are:

The first one-foot increment of shale that underlies the coal

The potentially acidic zones for the Upper Kittanning coal seam are:

Mining of the Upper Kittanning coal will be crop removal only and will encounter only well weathered material.

The potentially acidic zones for the Lower Freeport coal seam are:

Only the coal seam itself.

The potentially acidic zones for the Upper Freeport coal seam are:

The one-foot thick shale unit immediately above the Upper Freeport coal seam.

The first one-foot increment of shale that underlies the coal seam.

Maximum cubic yards of special handled material expected to be encountered.

Phase I

6.0 acres of CL 24" thickness at 5% being spoiled	= 968.0 cubic yards
4.9 acres of LK 40" thickness at 5% being spoiled	= 1317.5 cubic yards
5.0 acres of MK 34" thickness at 5% being spoiled	= 1142.8 cubic yards
2.75 acres of UK 24" thickness at 5% being spoiled	= 443.7 cubic yards
3.0 acres of shale above CL, 12" thickness	= 4840.0 cubic yards

Phase II

4.5 acres of MK 34" thickness at 5% being spoiled	= 1028.5 cubic yards
1.4 acres of UK 24" thickness at 5% being spoiled	= 225.8 cubic yards

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10.8 Special Handling of Potentially Acid-Forming, Toxic-Forming, and Alkaline-Producing Material(cont)

Phase III

2.4 acres of LF 26" thickness at 5% being spoiled	=	506.8 cubic yards
16.4 acres of UF 32" thickness at 5% being spoiled	=	3527.8 cubic yards
6.6 acres of shale above the UF, 12" thickness	=	10648.0 cubic yards
Total	=	24648.9 cubic yards

Acid/Base Accounting & Special Handling

For each seam to be mined the portion of the coal that is not trucked to market (maximum 5%) and strata immediately above the coal that has been removed as part of the coal pit preparations should be special-handled. All material to be special-handled should be placed in pods high in the backfill above the anticipated post-mining water table. Typical drawings for placement of this material are attached to Module 10.

Clarion

The initial 1.0 foot thick shale zone immediately above the Clarion coal seam shall be special-handled in addition to the above mentioned special handling for all seams.

Mining of the Clarion coal to a highwall of 40 feet may generate an alkaline deficiency as high as 198 tons per acre, exhibiting a net NP of -2.7 with thresholds, requiring 490 tons of 100% $CaCO_3$ per acre (534 tons at 91% $CaCO_3$ equivalency) to achieve a net NP of 4 with thresholds.

Maximum post mining water table anticipated at 6 feet (using the EPA HELP Model, Please see attachment)

Lower Kittanning

Mining will be conducted on the Lower Kittanning coal up to the abandoned Wilmore Coal 36 deep mine boundary.

Mining of the Lower Kittanning coal may generate an alkaline deficiency as high as 3 tons per acre, exhibiting a net NP of -.05 with thresholds, requiring 225 tons of 100% $CaCO_3$ per acre (245 tons at 91% $CaCO_3$ equivalency) to achieve a net NP of 4 with thresholds.

Middle Kittanning

Mining of the Middle Kittanning coal to a highwall of 60 feet may generate an alkaline deficiency as high as 37 tons per acre, exhibiting a net NP of -.38 with thresholds, requiring 430 tons of 100% $CaCO_3$ per acre (469 tons at 91% $CaCO_3$ equivalency) to achieve a net NP of 4 with thresholds.

Upper Kittanning

The Upper Kittanning coal has been heavily deep mined and surface mined in the permit area. However, as much as 50 feet of crop coal may exist on site.

An overburden waiver is requested for the Upper Kittanning coal since only the crop coal that has been left by previous mining can be removed.

Lower Freeport

Mining of the Lower Freeport coal to a highwall of 40 feet with no crop coal to be mined. May generate an alkaline deficiency as high as 6 tons per acre, exhibiting a net NP of -.08 with thresholds, requiring 160 tons of 100% $CaCO_3$ per acre (174 tons at 91% $CaCO_3$ equivalency) to achieve a net NP of 2 with thresholds.

A maximum of 300 feet of auger mining is proposed for the Lower Freeport coal.

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10.8 Special Handling of Potentially Acid-Forming, Toxic-Forming, and Alkaline-Producing Material(cont)

Upper Freeport

The initial 1.0 foot thick shale zone immediately above the Upper Freeport coal seam shall be special-handled in addition to the above mentioned special handling for all seams.

Mining of the Upper Freeport coal to a highwall of 50 feet may generate an alkaline excess as high as 290 tons per acre, exhibiting a net NP of +2.9 with thresholds. Therefore, no alkaline addition is proposed for the Upper Freeport coal seam.

A maximum of 300 feet of auger mining is proposed for the Upper Freeport coal.

The lime addition rates will be applied one-half to the floor of all pits developed on each coal seam and one-half immediately before spreading soil. Material to be used for lime addition will come from New Enterprise Stone and Lime Ashcom plant. Calcium carbonate equivalency of this material is 91%.

b) Show location of acid and toxic-forming material placement on Module 9 or, if too cluttered, on a separate map. Plan map(s) must show locations of placement and sequence of placement within mining plan, include coal crop lines, final highwall limits, pit dimensions, and phase and sequence of mining. Schematic plan maps will be accepted where placement is site-wide and exact pit locations can not be precisely determined.

The above material will be deposited high in the backfill in every cut area due to the small amount of material being placed. At backfilling, it will be placed above any local water table encountered in one compacted layer, at least 5 feet below soil level. It will also be placed a minimum of 10 feet above the pit floor or projected post-mining static water level and 10 feet from the final highwall in all other areas. This will avoid contact with water in the backfill.

c) Discuss, and show on cross-section(s), the location of the handled material relative to anticipated postmining groundwater conditions.

Cross-sections are not needed since the material will be placed, as described above. The material will be placed above any local water table encountered, in one compacted layer.

d) Describe the equipment to be used, and the methods to be used in the separation and handling of acid and toxic-forming material.

The associated binder or rooster in the coal seams, from the first cuts along the crop, will remain in the pit until placement, in the backfill. End loaders and/or trucks will be used to separate and place the potentially acid forming material.

e) Describe the groundwater monitoring plan and specify the monitoring points related to monitoring the success of the special handling plan. The monitoring program must include suitable groundwater monitoring points which will adequately represent groundwater from the area where special handling occurred. These must be in place and sampled prior to activation of mining.

Stream monitoring points 1, 2, 3, 8, 11, 12 and 29 will be used to monitor the groundwater from the proposed site. See Module 8.2 attachments.

f) Describe how special handling will be coordinated with other pollution prevention techniques such as alkaline addition, compaction, clay caps, etc.

Compacted clay seals will be placed along the exposed coal face, in the final highwalls and lowalls and to seal auger holes when complete.

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g) Describe the compaction and other methods that will be used to preclude combustion of the material.

Compaction will be accomplished using heavy equipment, as backfilling continues, to preclude combustion of the material.

10.9 Importation (Addition) and Redistribution of Alkaline Materials

a) Show on Module 9 or, if too cluttered, on a separate map the areas where alkaline addition or alkaline redistribution will be used. The map must show how much alkaline material will be added to specific areas (in total tons and in tons/acre). When different application rates will be used on different parts of the permit area, the map should delineate the boundaries of the different areas and their respective application rates. The maps for proposals for alkaline redistribution must show the areas where alkaline material will be obtained and where the material will be redeposited and the application rates.

b) Provide a detailed description, supplemented by plan views and maps, showing how the alkaline materials will be placed. If the addition of alkaline material is being done in conjunction with selective handling of overburden materials, cross-sections should be provided showing the placement of the alkaline material relative to the special handled overburden (this can be combined with the plans and cross-sections described in Module 10.8). Schematic plan maps will be accepted where placement is site-wide and exact pit locations can not be precisely determined.

Net NP material = 100% calcium carbonate equivalent.
Raw tons = 91% calcium carbonate equivalent material.

Phase I

A total of 490 Net NP tons per acre (534 raw tons per acre) will be placed on the Phase I Clarion pits, 50% on the pit floor and the remainder placed just below the subsoil.

A total of 225 Net NP tons per acre (245 raw tons per acre) will be placed on the Phase I Lower Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil.

A total of 430 Net NP tons per acre (469 raw tons per acre) will be placed on the Phase I Middle Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil.

A total of 55 Net NP tons per acre (60.5 raw tons per acre) will be placed on the Phase I Upper Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil.

Phase II

A total of 190 Net NP tons per acre (209 raw tons per acre) will be placed on the Phase II Middle Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil.

A total of 55 Net NP tons per acre (60.5 raw tons per acre) will be placed on the Phase II Upper Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil.

Phase III

A total of 160 Net NP tons per acre (174 raw tons per acre) will be placed on the Phase III Lower Freeport pits, 50% on the pit floor and the remainder placed just below the subsoil.

Mining of the Upper Freeport coal to a maximum 50-foot highwall will generate an alkaline excess as high as 290 tons per acre, exhibiting a net NP of +3.5 with thresholds. No alkaline addition is proposed for the Upper Freeport coal seam.

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10.9 Importation (Addition) and Redistribution of Alkaline Materials(cont)

c) **Describe how alkaline addition calculations were determined. Provide the calculations used to determine the amount of alkaline material. The amount of coal and boney material that would be spoiled must be accurately determined and considered in any alkaline addition calculations. This may include the top and bottom of a coal interval and any partings. Calculations should be reported as tons of alkaline material per acre, or tons of alkaline material per tons of overburden material, and as an application thickness. For example: "The limestone placed on the backfill surface will be 400 tons per acre, which is an approximate thickness of 2 inches."**

See the attached overburden ABA spreadsheets.

Phase I

A total of 490 Net NP tons per acre (534 raw tons per acre) will be placed on the Phase I Clarion pits, 50% on the pit floor and the remainder placed just below the subsoil. This amounts to 0.99 inches being applied to the pit floor with 0.99 inches placed below the subsoil.

A total of 225 Net NP tons per acre (245 raw tons per acre) will be placed on the Phase I Lower Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil. This amounts to 0.45 inches being applied to the pit floor with 0.45 inches placed below the subsoil.

A total of 430 Net NP tons per acre (469 raw tons per acre) will be placed on the Phase I Middle Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil. This amounts to 0.86 inches being applied to the pit floor with 0.86 inches placed below the subsoil.

A total of 55 Net NP tons per acre (60.5 raw tons per acre) will be placed on the Phase I Upper Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil. This amounts to 0.11 inches being applied to the pit floor with 0.11 inches placed below the subsoil.

Phase II

A total of 430 Net NP tons per acre (469 raw tons per acre) will be placed on the Phase II Middle Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil. This amounts to 0.86 inches being applied to the pit floor with 0.86 inches placed below the subsoil.

A total of 55 Net NP tons per acre (60.5 raw tons per acre) will be placed on the Phase II Upper Kittanning pits, 50% on the pit floor and the remainder placed just below the subsoil. This amounts to 0.11 inches being applied to the pit floor with 0.11 inches placed below the subsoil.

Phase III

A total of 160 Net NP tons per acre (174 raw tons per acre) will be placed on the Phase III Lower Freeport pits, 50% on the pit floor and the remainder placed just below the subsoil.

No alkaline addition is proposed for the Phase III Upper Freeport coal seam.

d) **The following information should be provided concerning the proposed alkaline material:**

1) **type of material, (e.g., limestone, hydrated lime, bag house lime, etc.)**
2) **source(s) of material**
3) **grain size distribution (particle size)**
4) **test analysis for purity, neutralization potential, and/or other indicators of alkaline potential. (The application rate must be adjusted to compensate for impurities.)**

Material to be used for lime addition will come from New Enterprise Stone and Lime Ashcom plant. Calcium carbonate equivalency of this material is 91%.