Monday, June 1, 2020

Nick San Diego
Illinois Depart. Of Natural Resources
Office of Mine & Minerals
One Natural Resources Way
Springfield, IL 62702-1271

RE: Completeness Responses
Vigo Coal Operating Co., LLC.
Friendsville Mine
Permit 330 & 458 – SIG. REV.

Dear Mr. San Diego,

Please accept the following material for completeness responses for Vigo Coal's 330 & 458 Permit – SIG. REVISION as outlined below.

The modifications required by the Department have been addressed as follows:

1. The applicant has included the location of Wabash Avenue Centerline, and Wabash Avenue ROW, however the safety berm and the diversion ditch cross section is not included on Attachment 3.12.2.1. To ensure compliance with 62 Ill. Adm. Code 1780.14(b), the applicant shall include a detailed cross section of the area of interest within cross section D, in which the south edge of the Slurry Pond #4, the diversion ditch and the safety berm are within Wabash Avenue ROW and come in proximity to the road. **An expanded view of Section D. has been provided in Attachment 3.12.2.1. The expanded view shows all activities within 100 feet of the county road right of way.**

2. Diversion ditch SP4-3 will experience velocities above 5 fps. To ensure compliance with 1780.14(b)(6), the applicant shall incorporate measures to prevent erosion of these ditch in response to Part 5.3.1.5. Location and extent of the proposed measures should be depicted on the ditch's design drawings. **SP4-3 was revised to reduce the velocity below 5 fps. See updated Table 5.3.1 and Attachment 5.3.1**

3. The applicant provided Attachment 9.4.1 but, the applicant did not include the question of this part of the application. Pursuant 62 Ill. Adm. Code 1780.25(a) and (c), the applicant shall include the question 9.4 and its respective answer. Specifically, details that have not been included in the application and shall be addressed are: water level of the final pool elevation of Slurry Pond #4, relationship of the refuse disposal area to the post-mining land use, sampling plan of refuse material for neutralization material rates and description of final drainage configuration of the impoundment. **Part 9.4 was added to the application. Final pool elevation was added to**

Attachment 3.12.2.1 and is also shown on Attachment 5.4.1.2. Attachment 9.4.1 was revised to address neutralization rates. None are proposed, water cover will be sufficient to prevent oxidation. The final configuration for the impoundment can be found on Attachments 3.12.2.1 and 5.4.1.2

4. The applicant failed to address how the slurry lines will be installed so as to comply with the Illinois Department of Agriculture guidelines for buried pipelines. That information shall be addressed in Part 3.2.5 of the application. A link to the appropriate requirements can be found in that part of the application. **See Part 3.2.5 for information pertaining to the depth of the buried pipelines. The proposed lines will be buried at a minimum of 5 feet.**

5. The applicant did not include ownership and control information for itself among table 1.3.1. The applicant shall review and provide listing of current ownership and control for Vigo Coal Operating Company, LLC. **Ownership & Control for Vigo Coal Operating Co., LLC. has been provided.**

6. The applicant was asked to list all relative permits on their operations map specifically. The applicant did not indicate Permit No. 458 on Operations Map 1, which is where the Slurry Cell #4 operations is located. **The Operations Maps have been corrected as requested.**

7. The applicant's response to Point No. 8 of the Department's March 19, 2020, Incomplete letter did not address/explain how the slurry and water lines will cross Wabash 12 Avenue. The response indicated the lines will be buried 4' deep but does not mention how they will be buried. For the Department to approve the public notice, information on whether the applicant intends on boring under, or temporarily closing to trench through, Wabash 12 Avenue. Also, if the applicant intends to bore under Wabash 12 Avenue, location of boring operations shall be provided. **Please see Part 3.10.4 for the crossing information.**

A copy of these responses and application will also be forwarded to William Gillespie at the Benton office.

If you should have any questions or comments regarding the material as outlined above, please do not hesitate to contact me at amessamore@whitestallioneenergy.com

Sincerely,

Terry Kissel
Environmental Affairs Manager
White Stallion Energy

Cover Sheet: Application for Coal Mining and Reclamation Operations

Applicant: Vigo Coal Operating Co., LLC.
Name of Company, Corporation, Partnership or Individual. **[1777.11]**

AVS ID: *(Optional)* 156249

Applicant is a: ☐ Corporation ☐ Partnership ☐ Sole Proprietor
☒ Association or other Business Entity **[1778.13(a)]**

Mine Name: Friendsville Mine
Address/PO 250 Cross Pointe Blvd.
City: Evansville
State: Indiana
Zip Code: 47715
Email Address: amessamore@whitestallionenergy.com
Phone Number: 812-473-0700
Fax Number:
Tax ID/FEIN: 34-1437462

Application Type:
☐ New ☐ MUF
☒ Existing Permit No(s). 330 & 458
☒ Sig. Rev No. 1 ☐ Renewal ☐ Transfer No. ___
☐ IBR ☐ SIBR
☐ IPR

Type of Operation: ☒ Surface ☐ Underground ☐ Carbon Recovery

Mine Safety Health Administration Information:

MSHA ID Number **11-03064** **[1778.13(d)(1)]**
Date of Issuance **5/1/2000**

List the Mine Safety and Health Administration (MSHA) number(s) for all mine associated structures that require MSHA approval. **[1778.13(g)]**

Structure Type	Structure Name	MSHA No.

Illinois Environmental Protection Agency Information:

Is application to be used as an application for an NPDES and/or Subtitle D?

☐ YES ☒ NO

NOTE: If this is an application for an NPDES permit, the Consolidated Permits Program, Application Form 2C (renewal), Form 2D (new), or Form 2E (sanitary) must be completed.

If YES, check the appropriate box below:

☐ IEPA Subtitle D State Permit
☐ NPDES *(New)*
☐ NPDES *(Renewal)*
☐ NPDES *(Modification)*

☐ I waive my right of the 90-day permit issuance deadline as required by Section 39(a)(4) of the Illinois Environmental Protection Act and 35 Ill. Adm. Code 309.225(c) of the Illinois Pollution Control Board Rules and Regulations.

Affidavits, Certifications, Insurance Certificates, Newspaper Notice, Financial Assurance. The applicant shall attach the appropriate affidavits required for the type of operations proposed, a draft public notice, and a valid certificate of insurance.

Check and attach the completed documents for the proposed operations, if applicable:

	Underground Mining Affidavit
	Planned Subsidence Mitigation Right of Entry Affidavit
	Underground Slurry Disposal Affidavit
	Public Land Survey Monuments Certification
X	Engineering Certification
	Technical Data Information Sheet
	Occupied Dwelling Buffer Zone Waiver

Complete below and attach the draft public notice for review. **[1778.21].**

	(Name of Newspaper)

Proof of general liability insurance from an authorized provider (licensed to write from the Illinois Department of Insurance), Performance bond

	Certificate of Insurance **[1778.18, 1817.121(c)(3)]**
	Evidence of required bond **(Renewals only) 1774.15**

☐ I waive the time limits for the Department to make its final permit decision pursuant to 62 Ill. Adm. Code 1773.19(a)(2)

I, _____ Authorized Representative, under penalties
(Signature, Title)

of perjury, declare that I have examined this application, including the accompanying statements and documents, and that, to the best of my knowledge, it is true and correct. I also certify that all printed copies of this application provided to the Department and County Clerk(s) are identical. **(Signer must be at least a Vice-President or duly authorized representative)**

Dated: 6/1/20

Description of Proposed Permitting Action:

Describe in sufficient detail the proposed activities. The information should summarize the requested permitting action to assist the Department in determining the scope and magnitude of the proposal.

Completeness Revisions - Sig. Revision to add a fine course refuse impoundment and to add developed water to the reclamation plan.

Application Part Inventory:

Application Part	Application Part Title	Indicate with an "X" all Parts modified with this submittal
1.0	**Administrative Information**	
1.1	General Information	
1.2	Acreage and Timetable	
1.3	Ownership and Control Information	X
1.4	Violation History	
1.5	Property Ownership	
2.0	**Pre-Mining information**	
2.1	Pre-Mining Land Use Information	
2.2	Pre-Mining Soils Information	
2.3	Areas Where Mining is Limited or Prohibited	
2.4	Public Parks, Historic Properties	
2.5	Valid Existing Rights (VER) - Good Faith/All Permits Standard	
2.6	Valid Existing Rights (VER) - Needed for and Adjacent Standard	
2.7	Valid Existing Rights (VER) - Standards for Mine Roads	
3.0	**Mining Operations Plan**	
3.1	General Description of Operations	
3.2	Description of Mine Facilities	
3.3	Signs and Markers	
3.4	Soil and Overburden Handling and Protection	
3.5	Lateral Support	
3.6	Surface Mining Near Underground Mining	
3.7	Existing Structures	
3.8	Transportation Facilities	
3.9	Non-Coal Mine Waste Material	
3.10	Coal Preparation	X
3.11	Coal Processing Waste and Underground Development Waste	
3.12	Coal Refuse Disposal Area	X
3.13	Air Pollution Control Plan	
3.14	Fire Control Plan	
4.0	**Hydrologic and Geologic Information**	
4.1	Regional Characteristics	
4.2	Hydrogeologic Information	
4.3	Area Specific Characteristics	
4.4	Ground Water Information	
4.5	Ground Water Monitoring Program	
4.6	Surface Water Information	
4.7	NPDES Monitoring Program	
4.8	Protection of Hydrologic Balance	
4.9	Preventative and Remedial Measures Plan	
4.10	Liners	

4.11	Coal Combustion Materials	
5.0	**Drainage Control**	
5.1	Pre-Mining Drainage Patterns Mapping	
5.2	General Drainage Control Description	
5.3	Conveyance Ditch Design	X
5.4	Impoundments	X
6.0	**Streams**	
6.1	Disturbance Information	
6.2	Stream Information	
6.3	Stream Buffer Variance	
6.4	Streams Outside Permit Boundary	
6.5	Existing Stream Locations	
6.6	Temporary Stream Diversions	
6.7	Permanent Stream Diversions	
6.8	Culverts and Crossing of Non-Diverted, Temporary, and/or Permanent Stream Channels	
6.9	Stream Buffer Zone	
7.0	**Fish and Wildlife**	
7.1	Pre-Mining Fish and Wildlife Resources	
7.2	Threatened and Endangered Species	
7.3	General Fish and Wildlife Protection and Enhancement Measures	
8.0	**Cropland Capability Soils**	
8.1	High Capability Post-Mining Land Use	
8.2	Pre-Mining Prime Farmland Soils	
8.3	Prime Farmland Soil Handling	
8.4	Prime Farmland Reclamation Plan and Map	
9.0	**Reclamation Plan**	
9.1	Post-mining Land Uses	
9.2	Backfilling and Grading	
9.3	Shaft, Slope, and Borehole Sealing	
9.4	Abandonment and Closure of Refuse Disposal Areas	X
9.5	Bond Estimation	
10.0	**Revegetation and Reclamation**	
10.1	Revegetation of Drainage Control Ditches	
10.2	Revegetation of Faces of Embankments	
10.3	Revegetation of Soil Stockpiles	
10.4	Revegetation of Refuse Disposal Facilities	
10.5	Pasture Reclamation Plan	
10.6	Fish and Wildlife Herbaceous Reclamation Plan	
10.7	Fish and Wildlife Woody Reclamation Plan	
10.8	Fish and Wildlife Wetland Reclamation Plan	
10.9	Fish and Wildlife Water and/or Developed Water Resources Reclamation Plan	
10.10	Forest Reclamation Plan	
10.11	Industrial/Commercial Reclamation Plan	
10.12	Recreation Reclamation Plan	
10.13	Habitat Diversification in Cropland	
11.0	**Blasting**	
11.1	Proposed Blasting	
11.2	Surface Mine Blasting	
11.3	Underground Mine Blasting	
12.0	**Shaft, Slope, and Miscellaneous Borehole Construction**	
12.1	Shafts and/or Slopes	

12.2	Miscellaneous Boreholes	
13.0	**Underground Extraction**	
13.1	General Shadow Area Information	
13.2	Unplanned Subsidence Control Plan	
13.3	Planned Subsidence Control Plan	
13.4	Subsidence Damage Mitigation	
13.5	Water Supplies	
13.6	Auger Mining	
14.0	**Disposal of Coal Waste in Underground Workings**	
14.1	MSHA Approval	
14.2	Waste Material Description	
14.3	Pneumatic Injection	
14.4	Surface Disturbance Operations	
14.5	Underground Workings Disposal Area	
14.6	Circuitry of the Disposal Operation	
14.7	Subsidence Control	
14.8	Hydrologic Balance Protection	
15.0	**Coal Combustion Materials**	
15.1	Coal Combustion By-Products (CCB)	
15.2	Coal Combustions Waste (CCW)	

PART 1: Administrative Information

1.1 General Information.

1.1.1 Applicant: **Vigo Coal Operating Co., LLC.**

Applicant is a: [X] Corporation [ ] Partnership [ ] Sole Proprietor
[ ] Association or other Business Entity **[1778.13(a)]**

Individual Contact: **Alex Messamore** **[1778.13(b)]**
(Name and Title)

Address/PO Box:	**250 Cross Pointe Blvd.**
City:	**Evansville**
State:	**Indiana**
Zip Code:	**47715**
Email Address:	**amessamore@whitestallionenergy.com**
Phone Number:	**812-473-0700**
Fax Number:	**812-759-2625**
Tax ID/FEIN No.	**35-1437462**

1.1.2 Resident Agent who will accept service of process for the applicant: **[1778.13(b)]**

Company: **Ziemer, Stayman, Weitzel, & Shoulders, LLP.**
Individual Contact: **Stephan Weitzel**
(Name and Title)

Address/PO Box:	**One Main St.**
City:	**Evansville**
State:	**Indiana**
Zip Code:	**47708**
Email Address:	
Phone Number:	**812-424-7575**
Fax Number:	
Tax ID/FEIN No.	

1.1.3 Who will be the operator at the permit site? **[1778.13(b)]**

[X] Applicant [ ] Other/Contract operator

If the operator is not the applicant, then complete Table 1.3.1 for the company/entity.

1.1.4 Who will pay Abandoned Mine Land Reclamation fees? **[1778.13(b)]**

[X] Applicant [ ] Other/Contract operator

1.2 Acreage and Timetable.

Pit or Portal No./Name	County	Sec(s)	Twp	Range	Total Acres
Friendsville Mine Permit 458	**Wabash**	**10**	**1S**	**13W**	**12.9**
Friendsville Mine Permit 330	**Wabash**	**15 & 22**	**1S**	**13W**	**10.1**
				TOTAL:	**23.0**

Shadow Area	County	Sec(s)	Twp	Range	Total Acres
				TOTAL:	

1.2.1 Indicate type of disturbance from mining and acreage associated with each type. **[1780.11/1784.11]**

Type of Disturbance:	**Acres**
Surface Mined Area	
Processing Areas & Support Facilities	**23.0**
Undisturbed Areas (optional)	
TOTAL ***(must equal total acres being permitted)***	**23.0**
Shadow Area	

1.2.2 Indicate on the Pre-Mining Land Use Map where future permits for coal refuse piles, coal waste impoundments, or other surface facilities would be located. Provide a general statement that future facilities will be located X number of miles from the current permit. **[1778.17(a); 1779.24(c)]**

Not Applicable

1.3 Ownership and Control Information.

1.3.1 Complete Table 1.3.1 to identify all owners/controllers of the applicant. Separate sheet/table shall be provided for each entity or individual deemed to be an owner/controller of the applicant.

Ownership or control is evidenced by:

- Being a permittee of a surface coal mining operation; or
- Based on instruments of ownership or voting securities, owning of record in excess of fifty (50) percent of an entity; or
- Having any other relationship which gives one person authority directly or indirectly to determine the manner in which an applicant, an operator, or other entity conducts surface coal mining operations

The following relationships are presumed to constitute ownership or control unless a person can demonstrate that the person subject to the presumption does not in fact have the authority directly or indirectly to determine the manner in which the relevant surface coal mining operation is conducted.

- Being an officer or director of an entity; or
- Being the operator of a surface coal mining operation; or
- Having the ability to commit the financial or real property assets or working resources of an entity;
- Being a general partner in a partnership; or
- Based on the instruments of ownership or the voting securities of a corporate entity, owning of record ten (10) through fifty (50) percent of the entity; or
- Owning or controlling coal to be mined by another person under a lease, sublease or other contract and having the right to receive such coal after mining or having authority to determine the manner in which that person or another person conducts a surface coal mining operation. **[1773.5, 1778.13(c)(1) to (c)(3)]**

1.3.2 Complete Table 1.3.2 for surface coal mining and reclamation operations, within the five (5) years preceding the date of the application for associated with: **[1778.13(c)(4)/1778.13(c)(5)]**

- Each Owner/Controller identified in Table 1.3.1
- The applicant.

1.4 Violation History.

1.4.1 Has the applicant, any subsidiary, affiliate, or persons controlled by or under common control with the applicant, had Federal, State, or Tribal coal mining permit suspended or revoked in the last five (5) years preceding the date of submission of the application? **[1778.14(a)(1)]**

☐ Yes ☒ No

1.4.2 Has the applicant, any subsidiary, affiliate, or persons controlled by or under common control with the applicant, had forfeited a performance bond or similar security deposited in lieu of bond? **[1778.14(a)(2)]**

☐ Yes ☒ No

If YES to either Questions 1.4.1 or 1.4.2, the applicant shall complete Table 1.4 for any permit/company associated with permit suspension, revocation or bond forfeiture. **[1778.14(a) and (b)]**

1.4.3 The applicant shall complete Table 1.4.3 for all violations received by the applicant or any one owning/controlling the applicant as provided in Table 1.3.1 during the three (3) year period preceding the application date. **[1778.14(c)]**

For any outstanding violation or violation under appeal listed in Table 1.4.3, the applicant shall provide supporting documentation showing good faith efforts for the violation from the issuing agency, or in the case of appeals provide documentation of current proceedings. **[1773.15(b), 1778.14(c)]**

NOTE: Provide as an Attachment to Part 1.4.3.

1.5 Property Ownership.

1.5.1 Complete Table 1.5.1 for (1) each legal or equitable owner of record, (2) each holder of leasehold interest, and (3) any purchaser of record under a real estate contract for the surface and mineral property within the proposed permit boundary. **[1778.13(e), 1778.15(a)]**

If the proposed permit is for a surface mine where the private mineral estate has been severed from the private surface estate, applicant must also provide the Department with:

- A copy of the written consent of the surface owner to the extraction of coal by surface mining methods; or
- A copy of the conveyance that expressly grants or reserves the right to extract the coal by surface mining methods; or
- If the conveyance does not expressly grant the right to extract the coal by surface mining methods, provide the Department with documentation that, under the applicable State law, the applicant has the legal authority to extract the coal by surface mining methods. **[1778.15(b)]**
- See Part 1.5.3, below, for additional requirements to uncontrolled properties.

NOTE: Provide as an Attachment to Part 1.5.1.

1.5.2 Complete Table 1.5.2 for any owner of record for property (surface and subsurface) contiguous to any part of the proposed permit boundary. **[1778.13(f)]**

Does the applicant have an interest in any lands, options or pending bids on interest for lands which are contiguous to the proposed permit area?

☐ Yes ☒ No

If YES, the applicant shall indicate in Table 1.5.2 all lands, interest in lands, options, or pending bids on interests held or made by the applicant for lands contiguous to the area described in the permit application. **[1778.13(h)]**

Upon request by the applicant, this information may be held in confidence by the Department, if not on public file. Does the applicant wish any of the above information to be held confidential?

☐ Yes ☒ No

If YES, the applicant shall identify which information is to be held confidential in its statement. **[1778.13(h)]**

1.5.3 Complete Table 1.5.3 for any owner of record for property (surface and subsurface) identified in Table 1.5.1 and shown on the Pre-Mining Land Use Map identified in 1.5.4, not owned by the applicant, identifying the documents and legal rights claimed to enter and mine.

All properties identified in Table 1.5.1 that the applicant does not have a legal right to enter and begin mining operations shall require submission of a Property Ownership Waiver form for each property identified for the application to be considered administratively complete [see Operator Memorandum No. 2011-01]

NOTE: Provide as an Attachment to Part 1.5.3.

1.5.4 Delineate all boundaries of lands and names of present owners of record of those lands, both surface and subsurface, included in or contiguous to the permit area on the Pre-Mining Land Use Map. The map shall also show lands within the permit area that are controlled properties (i.e. applicant is claiming legal right to enter and begin surface coal mining and reclamation operations) versus uncontrolled properties (i.e. applicant does not yet have the legal right of entry). **[1779.24(a) and (b)]**

TABLE 1.3.1
Owners and Controllers of the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
American Patriot Holding LLC (APH)	250 Cross Pointe Boulevard , Evansville, In 47715	27-1501363	Holding Company	96%	Holding Company	31-Dec-09	N/A
Steven E Chancellor	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Chairman/Member	71.80%	Member/Officer (APH)	31-Dec-09	N/A
Daniel S Hermann	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	President/Member	15.18%	Member/Officer (APH)	31-Dec-09	N/A
R Karen Skipper	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Secretary	None	Officer (APH)	31-Dec-09	N/A
Eugene D Aimone	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Member	<10%	Member	31-Dec-09	31-Dec-14
Aimone Family LLC	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Member	<10%	Member	31-Dec-09	31-Dec-14
Shane A Chancellor	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Member (APH)	<10%	Member	31-Dec-09	N/A
Andrew S Hermann	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Member (APH)	<10%	Member	31-Dec-09	N/A
Rashid G Hallaway	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Member (APH)	<10%	Member	31-Dec-09	N/A
Hunter Chancellor	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Member (APH)	<10%	Member	31-Dec-09	N/A
Carleen Tisserand	250 Cross Pointe Boulevard , Evansville, In 47715	N/A	Assistant Secretaary	None	Officer (APH)	1-Jul-17	N/A

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Owners and Controllers of the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
American Patriot Energy LLC (APE)	250 Cross Pointe Boulevard, Evansville, In 47715	26-1937754	Sole Owner of White Stallion Holding LLC	100%	Member (WSH)	31-Dec-09	N/A
American Patriot Holding LLC (APH)	250 Cross Pointe Boulevard, Evansville, In 47715	27-1501363	Majority Owner of American Patriot Energy LLC	96%	Member (APE)_	1-Jan-16	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chairman	None	Officer	1-May-08	31-Dec-15
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chairman/President (APE)	None	Officer (APE)	1-Jan-16	N/A
Daniel S Hermann	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	President	None	Officer (APE)	1-May-08	31-Dec-15
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary	<10%	Officer (APE)	31-Dec-14	N/A
Richard M Whiting	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Board Member (APE)	<10%	Member (APE)_	1-Jan-16	N/A
Thomas William Franks	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Board Member (APE)	<10%	Member (APE)_	1-Jan-16	N/A
Richard P Rechter	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Board Member (APE)	<10%	Member (APE)_	1-Jan-16	N/A
Terri L Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Member (APE)	<10%	Member (APE)_	1-Jan-16	N/A
Carleen A Tisserand	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Assistant Secretary / Member (APE)	<10%	Member (APE)_	1-Jan-16	N/A
John C Gisler	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Member (APE)	<10%	Member (APE)_	1-Jan-16	N/A
Eugene D Aimone	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Member (APE)	<10%	Member (APE)_	1-May-08	31-Dec-15
Aimone Family LLC	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Member (APE)	<10%	Member (APE)_	10-Nov-08	31-Dec-15
Shane A Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Member (APE)	<10%	Member (APE)_	1-May-08	31-Dec-15
Andrew S Hermann	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Member (APE)	<10%	Member (APE)_	1-May-08	31-Dec-15
Rashid G Hallaway	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Member (APE)	<10%	Member (APE)_	1-May-08	31-Dec-15

TABLE 1.3.1
Owners and Controllers of the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
White Stallion Holdings LLC (WSH)	250 Cross Pointe Boulevard, Evansville, In 47715	82-0993645	Parent Member of White Stallion Energy LLC	97%	Parent Member WSE	1-Jan-16	N/A
American Patriot Energy LLC (APE)	250 Cross Pointe Boulevard, Evansville, In 47715	26-1997754	Sole Member of White Stallion Holdings LLC	100%	Member (WSH)	1-Jan-16	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chairman/President	None	Officer (WSH)	1-Jan-16	N/A
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary	None	Officer (APE)	1-Jan-16	N/A
Carleen A Tisserand	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Asst Secretary	None	Officer (APE)	1-Jan-16	N/A

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Owners and Controllers of the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
White Stallion Coal LLC	250 Cross Pointe Boulevard, Evansville, In 47715	27-1932360	Former Name of White Stallion Energy LLC	Same as WSE	Same as WSE	9-Feb-10	26-Feb-15
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	President	None	Officer	9-Feb-10	1-Jan-16
Daniel S Hermann	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Vice President	None	Officer	9-Feb-10	31-Dec-15
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary	None	Officer	9-Feb-10	1-Jan-16
Gene Kempf	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Assistant Secretary/Treasurer	None	Officer	26-Feb-13	31-Dec-15
White Stallion Energy LLC	250 Cross Pointe Boulevard, Evansville, In 47715	27-1932360	Sole Owner of White Stallion - Eagle River LLC	100%	Sole Member	26-Feb-13	N/A
White Stallion Holdings LLC	250 Cross Pointe Boulevard, Evansville, In 47715	82-0953645	Parent Member of White Stallion Energy LLC	97%	Parent Member WSE	1-Jan-16	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	President/Chairman White Stallion Energy LLC (W	None	Officer (White Stallion Energy LLC)	1-Jan-16	N/A
Felson L. Bowman	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Vice Chairman / SR VP of Mining (WSE)	None	Officer (White Stallion Energy LLC)	15-Feb-19	N/A
Shane A Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Vice President White Stallion Energy LLC	None	Officer (White Stallion Energy LLC)	1-Jan-16	29-Aug-18
Shane A Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Senior Vice President (WSE)	None	Officer (White Stallion Energy LLC)	29-Aug-18	N/A
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary, White Stallion Energy LLC	None	Officer (White Stallion Energy LLC)	8-Mar-13	N/A
Mark M Sebree	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Senior Vice President White Stallion Energy LLC	None	Officer (White Stallion Energy LLC)	1-Jan-16	15-Feb-19
J. Bryan Maryan	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Senior Vice President (WSE)	None	Officer (White Stallion Energy LLC)	15-Feb-19	N/A
Raymond Park	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chief Financial Officer White Stallion Energy LLC	None	Officer (White Stallion Energy LLC)	7-Mar-16	30-Apr-17
Kelly Duncan	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chief Financial Officer White Stallion Energy LLC	None	Officer (White Stallion Energy LLC)	9-Jun-17	15-Feb-19
Timothy J. Sholtis	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Senior VP of Finance (WSE)	None	Officer (White Stallion Energy LLC)	15-Feb-19	6-Mar-20
John Harman	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Senior Vice President (WSE)	None	Officer (White Stallion Energy LLC)	15-Feb-19	N/A
Matthew A. Ubelhor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	SR VP of Mining (WSE)	None	Officer (White Stallion Energy LLC)	29-Aug-18	N/A
Jacqueline Ponder Bowman	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Senior VP & General Counsel (WSE)	None	Officer (White Stallion Energy LLC)	15-Feb-19	N/A
Carleen Tisserand	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Assistant Secretary (WSE)	None	Officer (White Stallion Energy LLC)	29-Aug-18	N/A
White Stallion Coal LLC changed Name to White Stallion Energy LLC (Name Change Only)							

TABLE 1.3.1
Owners and Controllers of Associate to the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location in Organizational Structure	Date Position Assumed	Termination Date
White Stallion - Eagle River LLC (WS - ER LLC)	250 Cross Pointe Boulevard, Evansville, In 47715	82-09536743	Majority Owner/Member - Eagle River Coal LLC	51%	Member	17-Apr-17	N/A
White Stallion Energy LLC	250 Cross Pointe Boulevard, Evansville, In 47715	27-1932360	Sole Owner/Member of White Stallion - Eagle River LLC	100%	Member	17-Apr-17	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	President/Chairman White Stallion - Eagle River LLC	None	Officer (WS - ER LLC)	17-Apr-17	N/A
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary, White Stallion - Eagle River LLC	None	Officer (WS - ER LLC)	17-Apr-17	N/A
Carleen A Tisserand	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Asst Secretary - White Stallion - Eagle River LLC	None	Officer (WS - ER LLC)	1-Jul-17	N/A
White Stallion - Eagle River LLC Formed Apr 17, 2017							
There are no other officers or owners for White Stallion - Eagle River LLC							
Franks LLC was never a member/owner of WS - ER LLC							

TABLE 1.3.1
Owners and Controllers of Associate to the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
Franks LLC	29 W Raymond St. Harrisburg, Illinois 62946	27-0070997	Member - Eagle River Coal LLC	24% ERC	Member	15-Apr-10	N/A
Thomas William Franks	29 W Raymond St. Harrisburg, Illinois 62946		President/Owner Franks, LLC	100% Franks LLC	President	15-Apr-10	N/A
Thomas William Franks	29 W Raymond St. Harrisburg, Illinois 62946		CEO - Franks LLC		CEO	1-Jan-09	4/17/2017
Thomas Walker Franks	29 W Raymond St. Harrisburg, Illinois 62946		Member of Franks LLC	<10%	Member	1-Jan-11	17-Apr-17
Thoams Ryan Franks	29 W Raymond St. Harrisburg, Illinois 62946		President - Franks LLC		President	1-Jan-11	4/17/2017
Thomas Ryan Franks	29 W Raymond St. Harrisburg, Illinois 62946		Member - Franks LLC	<10%	Member	15-Apr-10	4/17/2017
Amanda Franks Holland	29 W Raymond St. Harrisburg, Illinois 62946		Member - Franks LLC	<10%	Member	1-Jan-11	4/17/2017
Elizabeth Franks Pilcher	29 W Raymond St. Harrisburg, Illinois 62946		Member - Franks LLC	<10%	Member	11-Jan-11	4/17/2017

TABLE 1.3.1
Owners and Controllers of Associate to the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
Eagle River Coal LLC (ERC)	29 W Raymond St. Harrisburg, Illinois 62946	26-4206614	Applicant	N/A	Applicant	6-Oct-17	N/A
Franks LLC	29 W Raymond St. Harrisburg, Illinois 62946	27-0070997	Member of Eagle River Coal LLC	50%	Member	15-Apr-10	17-Apr-17
Thomas R Franks	29 W Raymond St. Harrisburg, Illinois 62946	N/A	Member of Eagle River Coal LLC	20%	Member ERC	15-Apr-10	17-Apr-17
Franks LLC	29 W Raymond Sf. Harrisburg, Illinois 62946	27-0070997	Member of Eagle River Coal LLC	24%	Member	17-Apr-17	N/A
White Stallion - Eagle River LLC	250 Cross Pointe Boulevard, Evansville, In 47715	82-0936743	Majority Member of Eagle River Coal LLC	51%	Member	17-Apr-17	N/A
Thomas Ryan Franks	600 Big Ridge Road, Harrisburg Illinois 62946	N/A	Member of Eagle River Coal LLC	None	Vice President	17-Apr-17	N/A
Thomas William Franks	29 W Raymond St. Harrisburg, Illinois 62946	N/A	Chief Executive Officer Eagle River Coal LLC	None	CEO	17-Apr-17	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chairman of Board-Eagle River Coal LLC	None	Chairman	17-Apr-17	N/A
Joey Pilcher	720 Big Ridge Road, Harrisburg Illinois 62946	N/A	Secretary-Eagle River Coal LLC	None	Officer	10-Oct-10	17-Apr-17
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary-Eagle River Coal LLC	None	Officer	17-Apr-17	N/A
Phyllis Slightom	29 W Raymond Sp. Harrisburg, Illinois 62946	N/A	Chief Financial Officer-Eagle River Coal LLC	None	CFO	27-Jun-11	17-Apr-17
Ray Vanover	29 W Raymond Sr. Harrisburg, Illinois 62946	N/A	Executive Vice President Eagle River Coal LLC	None	EVP	14-Feb-15	17-Apr-17
George Joe Pearson	29 W Raymond Sg. Harrisburg, Illinois 62946	N/A	President Eagle River Coal LLC	None	President Deceased	15-Apr-10	10-Feb-14
Elizabeth Franks Pilcher	29 W Raymond Se. Harrisburg, Illinois 62946	N/A	Member of Eagle River Coal LLC	<10%	Member ERC	11-Jan-11	N/A
Amanda Franks Holland	29 W Raymond Sa. Harrisburg, Illinois 62946	N/A	Member of Eagle River Coal LLC	<10%	Member ERC	11-Jan-11	N/A
Thomas Walker Franks	29 W Raymond St. Harrisburg, Illinois 62946	N/A	Member of Eagle River Coal LLC	<10%	Member ERC	11-Jan-11	N/A

TABLE 1.3.1
Owners and Controllers of Associate to the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
White Stallion - Solar LLC (WSS)	250 N Cross Pointe Blvd, Evansville Indiana 47715	82-0929457	Member Solar Sources Mining LLC	100% (SSM)	Member	17-Apr-17	N/A
White Stallion Energy LLC	250 N Cross Pointe Blvd, Evansville Indiana 47715	27-1932360	Sole Member White Stallion - Solar LLC	100% Owner (WSS)	Member	14-Mar-17	N/A
Steven E Chancellor	250 N Cross Pointe Blvd, Evansville Indiana 47715	N/A	Chairman/President	None	Officer (WSS)	14-Mar-17	N/A
R Karen Skipper	250 N Cross Pointe Blvd, Evansville Indiana 47715	N/A	Secretary	None	Officer (WSS)	14-Mar-17	N/A

TABLE 1.3.1
Owners and Controllers of Associate to the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
Solar Sources Mining LLC (SSM)	6755 South Gray Road, Indianapolis Indiana 46237	35-1323628	Associate Company		Associate	3-Apr-17	N/A
White Stallion - Solar LLC	250 Cross Pointe Blvd, Evansville Indiana 47715	82-0929457	Member Solar Sources Mining LLC	100%	Member	17-Apr-17	N/A
Felson Bowman	6755 South Gray Road, Indianapolis Indiana 46237	N/A	CEO	None	Officer (SSM)	17-Apr-17	N/A
Steven E Chancellor	250 N Cross Pointe Blvd, Evansville Indiana 47715	N/A	Chairman	None	Officer (SSM)	17-Apr-17	N/A
Fred A Bowman	6755 South Gray Road, Indianapolis Indiana 46237	N/A	President	None	Officer (SSM)	17-Apr-17	N/A
J Brian Maryan	6755 South Gray Road, Indianapolis Indiana 46237	N/A	CFO	None	Officer (SSM)	31-Mar-17	N/A
David Bricker	6755 South Gray Road, Indianapolis Indiana 46237		Vice President / Treasurer		Officer (SSM)	1-Mar-18	N/A
Jacqueline Bowman Ponder	6755 South Gray Road, Indianapolis Indiana 46237	N/A	Secretary	None	Officer (SSM)	15-Sep-16	1-Mar-18
Jacqueline Bowman Ponder	6755 South Gray Road, Indianapolis Indiana 46237	N/A	Chief Legal Officer	None	Officer (SSM)	15-Feb-19	N/A
Candice Dee Bruns	6755 South Gray Road, Indianapolis Indiana 46237	N/A	Asst Secretary	None	Officer (SSM)	1-Jan-85	1-Mar-18
Matthew R Atkinson	PO Box 7, Petersburg, Indiana 47567	N/A	Vice President Mining	None	Officer (SSM)	1-Jan-85	1-Mar-18
R. Karen Skipper	250 Cross Pointe Blvd, Evansville Indiana 47715	N/A	Secretary	None	Officer (SSM)	15-Feb-19	N/A
Carleen Tisserand	250 Cross Pointe Blvd, Evansville Indiana 47715	N/A	Assistant Secretary	None	Officer (SSM)	1-Mar-18	N/A
Timothy Sholtis	250 Cross Pointe Blvd, Evansville Indiana 47715	N/A	Senior VP of Finance	None	Officer (SSM)	15-Feb-19	6-Mar-20

TABLE 1.3.1
Owners and Controllers of the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
White Stallion Acquisition LLC	250 Cross Pointe Boulevard, Evansville, In 47715	81-1492298	Sole Member Vigo Coal Operating Company LLC	100%	Member	9-Mar-16	N/A
White Stallion Energy LLC	250 Cross Pointe Boulevard, Evansville, In 47715	27-193260	Sole Member White Stallion Acquisition LLC	100%	Member	17-Feb-16	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chairman/President (WSA)	None	Officer (WSA)	17-Feb-16	N/A
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary (WSA)	None	Officer (WSA)	17-Feb-16	N/A
Carleen Tisserand	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Assistant Treasurer	None	Officer (WSA)	17-Feb-16	N/A
Timothy J. Sholtis	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	SR VP / CFO	None	Officer (WSA)	15-Feb-19	6-Mar-20
Kelly Duncan	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	CFO	None	Officer (WSA)	1-Jul-17	2/15/2019

TABLE 1.3.1
Owners and Controllers of the Applicant

Name	Address	SSN (voluntary)/EIN	Ownership or Control Relationship to the Applicant/Position-Title	Ownership Percentage	Location In Organizational Structure	Date Position Assumed	Termination Date
Vigo Coal Operating Co., LLC.	250 Cross Pointe Boulevard, Evansville, In 47715	35-1437462	Applicant	None	Applicant	9-Mar-16	N/A
White Stallion Acquisition LLC	250 Cross Pointe Boulevard, Evansville, In 47715	81-1492298	Sole Member Vigo Coal Operating Co., LLC.	100%	Member	17-Feb-16	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	President	None	Officer (VCOC)	29-Aug-18	N/A
Steven E Chancellor	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Chairman of the Board	None	Officer (VCOC)	17-Mar-16	29-Aug-18
Kelly Duncan	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	VP/Secretary/Treasurer	None	Officer (VCOC)	17-Feb-16	15-Feb-19
Timothy J. Sholtis	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	VP/Secretary/Treasurer	None	Officer (VCOC)	15-Feb-19	6-Mar-20
R Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Assistant Secretary	None	Officer (VCOC)	15-Feb-19	N/A
Carleen A. Tisserand	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Assistant Secretary	None	Officer (VCOC)	7-Mar-16	N/A
Carleen A. Tisserand	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Assistant Treasurer	None	Officer (VCOC)	7-Mar-16	N/A
John C. Harman	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	President	None	Officer (VCOC)	17-Mar-16	29-Aug-18
Raymond T. Purk	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	VP/Secretary/Treasurer	None	Officer (VCOC)	17-Mar-16	22-May-17
R. Karen Skipper	250 Cross Pointe Boulevard, Evansville, In 47715	N/A	Secretary	None	Officer (VCOC)	17-Feb-16	15-Feb-19

TABLE 1.4.3
List of Violations by Applicant the Past 3 Years

Issuing Agency	State and Permit No. or MSHA Number	State Violation No. or MSHA Violation No.	Issue Date	Name of Company or Person to Whom Violation Issued	Description of the Violation	Date, Location and Type of Administrative or Judicial Proceeding	Violation Status	Abatement Actions
IL-DNR	11-03064	84-01-18	4/11/2018	Vigo Coal Operating Co., LLC.	Failure to control air blast	None	Terminated	Compliance for the next 8 blasts
IL-DNR	11-03064	84-02-18	9/5/2018	Vigo Coal Operating Co., LLC.	Failure to control air blast & ground vib.	None	Terminated	Compliance for the next 8 blasts
IL-DNR	11-03064	67-06-18	12/17/2018	Vigo Coal Operating Co., LLC.	Failure to Reclaim	None	Terminated	Reclaim Area
IL-DNR	11-03064	67-02-19	5/15/2019	Vigo Coal Operating Co., LLC.	Failure to remove & segragate topsoil	None	Terminated	properly bench top soil
IL-DNR	11-03064	67-05-19	11/14/2019	Vigo Coal Operating Co., LLC.	Failiure to obtain prior approval for coal stockpile	None	Terminated	Submitt IPR

TABLE 1.3.2
Ownership and Control Information for Other Permitted U.S. Surface Coal Mining and Reclamation Operations

Owner/Entity from Table 1.4.1	Permittee/Company Name of Operation in U.S. Individual has been associated with for the Previous 5 Years	Position Title to Company	Company EIN	Federal or State Permit Number	State	Name of Regulatory Authority	MSHA Number with Date of Insurance
White Stallion Acquisition, LLC (WSA)	Vigo Coal Operating Company, LLC (VCOC)	Sole Owner VCOC	35-1437462	S-343, S-349, 330 & 395, S-366, & S-366-1	IN & IL	Illinois Dept. Of Natural Resources, Indiana Dept. of Natural Resources	12-02259, 12-02305, 11-03064, 12-02428
White Stallion Energy LLC (WSE)	White Stallion Energy LLC (WSE)	Sole Owner (WSA)	81-1492298	S-373	IN	Indiana Dept. of Natural Resources	12-02456
White Stallion Energy LLC (WSE)	White Stallion - Solar Sources LLC	Member White Stallion - Solar, LLC	82-0929457	S-298, S-270, S-126, P-20, S-324, S340, S-355, S-364	IN	Indiana Dept. of Natural Resources	12-01732, 12-01616, 12-01978, 12-02234, 12-022372, 12-02374

TABLE 1.4.3
List of Violations by Applicant the Past 3 Years

Issuing Agency	State and Permit No. or MSHA Number	State Violation No. or MSHA Violation No.	Issue Date	Name of Company or Person to Whom Violation Issued	Description of the Violation	Date, Location and Type of Administrative or Judicial Proceeding	Violation Status	Abatement Actions
IL-DNR	11-03064	84-01-18	4/11/2018	Vigo Coal Operating Co., LLC.	Failure to control air blast	None	Terminated	Compliance for the next 8 blasts
IL-DNR	11-03064	84-02-18	9/5/2018	Vigo Coal Operating Co., LLC.	Failure to control air blast & ground vib.	None	Terminated	Compliance for the next 8 blasts
IL-DNR	11-03064	67-06-18	12/17/2018	Vigo Coal Operating Co., LLC.	Failure to Reclaim	None	Terminated	Reclaim Area
IL-DNR	11-03064	67-02-19	5/15/2019	Vigo Coal Operating Co., LLC.	Failure to remove & segragate topsoil	None	Terminated	properly bench top soil
IL-DNR	11-03064	67-05-19	11/14/2019	Vigo Coal Operating Co., LLC.	Failiure to obtain prior approval for coal stockpile	None	Terminated	Submitt IPR
IL-DNR	11-03064	84-02-20	3/18/2020	Vigo Coal Operating Co., LLC.	Failure to control air blast	None	Terminated	Compliance for the next 8 blasts

TABLE 1.4.3
List of Violations by Applicant the Past 3 Years

Issuing Agency	State and Permit No. or MSHA Number	State Violation No. or MSHA Violation No.	Issue Date	Name of Company or Person to Whom Violation Issued	Description of the Violation	Date, Location and Type of Administrative or Judicial Proceeding	Violation Status	Abatement Actions
ID NR OMM LRD	11-03212	67-01-20	3/2/2020	Eagle River Coal LLC	Failure to protect top soil pile	N/A	Terminated	Top soil pile was mulched
ID NR OMM LRD	11-03212	84-01-20	3/2/2020	Eagle River Coal LLC	Failure to Control Air Blast	N/A	Abated	Compliance for next 10 blasts

TABLE 1.4.3
List of Violations by Applicant the Past 3 Years

Issuing Agency	State and Permit No. or MSHA Number	State Violation No. or MSHA Violation No.	Issue Date	Name of Company or Person to Whom Violation Issued	Description of the Violation	Date, Location and Type of Administrative or Judicial Proceeding	Violation Status	Abatement Actions
Indiana DNR	S-340	N70419-S-840	4/19/2017	Solar Sources Mining LLC	Failure to sample water prior to discharge	N/A	Terminated	Ceased pumping. Began sampling.
Indiana DNR	S-340	N80123-S-340	1/23/2018	Solar Sources Mining LLC	Exceeded ground vibration	N/A	Terminated	Subsequent shots in compliance.
Indiana DNR	S-298	N80829-S-298	8/30/2018	Solar Sources Mining LLC	Exceeded ground vibration	N/A	Terminated	Subsequent shots in compliance.
Indiana DNR	P-20	N90315-P-20	3/15/2019	Solar Sources Mining LLC	Disturbance off bond	N/A	Terminated	Relocated bond
Indiana DNR	S-340	N90617-S-340	6/17/2019	Solar Sources Mining LLC	Fly rock cast	N/A	Terminated	Flyrock was picked up
Indiana DNR	S-355	N91205-S-355	12/12/2019	Solar Sources Mining LLC	Fly rock cast	N/A	Terminated	Flyrock was picked up
Indiana DNR	S-298	N00115-S-298	1/15/2020	Solar Sources Mining LLC	Failure to post Mine ID SIgns Failure to control drainage Failure to protect topsoil from loss	N/A	Terminated	Signs Posted Submitted AMDC Seed & Mulched Topsoil
Indiana DNR	S-355	N00116-S-355	1/17/2020	Solar Sources Mining LLC	Failure to protect topsoil from loss	N/A	Terminated	Constructed Soil Benches
Indiana DNR	S-298	N00212-S-298	2/13/2020	Solar Sources Mining LLC	Failure to Dispose of all coal mine waste in accordance to plan Failure to Pass Drainage thru Sediment basin	N/A	Terminated	Dispose waste according to plan Ceased discharge; added silt fence and straw bales
Indiana DNR	S-340	N00225-S-340	2/25/2020	Solar Sources Mining LLC	Failure to protect Unremoved topsoil form loss	N/A	Terminated	Constructed Soil Benches

TABLE 1.5.1
Property Interest Holders Within Permit Area

Name	Address	Type of Holder: Legal/Equitable/Leaseholder/Purchaser	Surface or Mineral Property	Parcel ID	Map ID Reference
SARA J BARKER TRUST	1411 ASHMORE DR., EVANSVILLE, IN 47725	Legal	Surface and Mineral (100)		13
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface and Mineral (100)		14
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface and Mineral (100)		18
HOMER MAJORS	16433 E 850 RD., MT. CARMEL, IL 62863	Legal	Surface and Mineral (100)		23
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface (100)		25
KEITH KOLB	8984 NORTH 1600 BLVD., MT. CARMEL, IL 62863	Legal	Mineral (100)		25
SHARON MAJORS	8177 N 1600 BLVD., BROWNS, IL 62818	Legal	Surface and Mineral (100)		26
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface (100)		27
KEITH KOLB	8984 NORTH 1600 BLVD., MT. CARMEL, IL 62863	Legal	Mineral (100)		27
KEITH KOLB	8984 N 1600 RD., MT. CARMEL, IL 62863	Legal	Surface and Mineral (100)		30
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface and Mineral (100)		50
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface and Mineral (100)		52
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface (100)		54
KEITH KOLB	8984 NORTH 1600BLVD., MT. CARMEL,62863	Legal	Mineral (100)		54
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Legal	Surface (100)		55
KEITH KOLB	8984 NORTH 1600 BLVD, MT. CARMEL, IL 62863	Legal	Mineral (100)		55

TABLE 1.5.2
Property Interest Holders Contiguous to the Permit Area

Name	Address	Surface or Mineral Property	Parcel ID	Map ID Reference
ANDREW G CARTER	7722 WABASH 17 AVE,. MT. CARMEL, IL 62863	Surface/Mineral (100)		1
TOBY S. HALL % LOUIS TENNIS, ET AL	3907 N. 1400 BLVD., BROWNS, IL 62818	Surface/Mineral (100)		2
JUSTIN G. SWANSON	8027 WABASH 17 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		3
DARIN D CAMPBELL	8170 WABASH 17 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		4
SHIRLEY S. GOODSON	7577 WABASH 17 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		5
JOHNNY MIKE WALLS	7488 WABASH 17 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		6
GOODSON ORCHARD, INC.	7261 WABASH 17 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		7
DEANNA PETERS, M. MCCONNELL, & L. MCWILLIAMS	226 CHERRY HILLS DR., MT. CARMEL, IL 62863	Surface/Mineral (100)		8
MAK ENERGY, LLC	15586 HIGHWAY 1, MT. CARMEL, IL 62863	Mineral (100)		9
KEITH KOLB	8984 N 1600 RD., MT. CARMEL, IL 62863	Surface		9
KEITH J. KOLB	8984 N 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		10
ROBERT & EVELYN MOUNTS	9274 N 1400 BLVD., MT. CARMEL, IL 62863	Surface/Mineral (100)		11
JOHN HAASE	7733 WABASH 17 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		12
SARA J BARKER TRUST	1411 ASHMORE DR., EVANSVILLE, IN 47725	Surface/Mineral (100)		13
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Surface/Mineral (100)		14
MAK ENERGY, LLC	15586HIGHWAY 1, MT. CARMEL, IL 62863	Mineral (100)		15
KEITH KOLB	8984 N 1600 RD., MT. CARMEL, IL 62863	Surface		15
DENNIS O. KEIFFER	6797 MUNDY LANE, MT. CARMEL, IL 62863	Surface/Mineral (100)		16
HELEN I. KIEFFER, TRUSTEE	16673 WABASH 13 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		17
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Surface/Mineral (100)		18
HIROK FARMS, LP/C/O RICHARD O. KIEFFER	16673 WABASH 13 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		19
CHARLES M. KIEFFER	100 W. ANCASTER, WEST SALEM, IL 62476	Surface/Mineral (100)		20
EVAH VEIHMAN	16465 WABASH 13 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		21
LUKE BAUMGART		Surface/Mineral (100)		22
HALLOCK CEMETERY		Surface/Mineral (100)		24
KEITH KOLB	8984 NORTH 1600 BLVD., MT. CARMEL, IL 62863	Mineral (100)		25
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Surface		25
FRED REIBER	19772 WABASH 18 AVE., ALLENDALE, IL 32410	Surface/Mineral (100)		28
JAY PETTYJOHN	311 LADUE DRIVE, MT. CARMEL, IL62863	Surface/Mineral (100)		29
KEITH KOLB	8984 N 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		30
CLARENCE JOHNSON	8558 N 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		31
DAMON & SHANNON YOUNT	8678 N 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		32
DEAN KLAUS	8870 N 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		33
KEITH KOLB	8984 N 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		34
KEITH KOLB	8984 N 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		35
EVAH VEIHMAN	16465 WABASH 13 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		36
IRENE HAASE	15569 WABASH 13 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		37
DAVID RIGG	8842 N 1550 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		38
CHARLES W. RIGGS	8699 N. 1600 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		39
GLEN WILSON	15964 E 850 RE., MT. CARMEL, IL 62863	Surface/Mineral (100)		40
AMY CLODFELTER	15860 E 850 RED., MT. CARMEL, IL 62863	Surface/Mineral (100)		41
JESSE & JENNIFER JONES	15698 E 850 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		42
THAD & TRINITY BRITTON	15661 E 850 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		43
CONNIE PEARSON	15720 E 850 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		44
JESSE & JENNIFER JONES	15698 E 850 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		45
THAD & TRINITY BRITTON	15661 E 850 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		46
ROBERT M. JOHNSON	8566 N 1550 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		47
ROBERT & EVELYN MOUNTS	9274 N 1400 BLVD., MT. CARMEL, IL 62863	Surface/Mineral (100)		48
MAK ENERGY (MTC-48)	P.O. BOX 458, MT. CARMEL, IL 62863	Surface/Mineral (100)		49
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Surface/Mineral (100)		50
FRED STECKLER	7323 WABSH 12 AVE., MT. CARMEL, IL 62863	Surface/Mineral (100)		51
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Surface/Mineral (100)		52
JERRY STONEBERGER	15562 E 700 RD., MT. CARMEL, IL 62863	Surface/Mineral (100)		53
KEITH KOLB	8984 NORTH 1600BLVD., MT. CARMEL,62863	Mineral (100)		54
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Surface		54
KEITH KOLB	8984 NORTH 1600 BLVD, MT. CARMEL, IL 62863	Mineral (100)		55
MAK ENERGY, LLC	P.O. BOX 458, MT. CARMEL, IL 62863	Surface		55
GEORGE FRANKLIN TREECE, ETAL	804 W 6TH STREET, MT. CARMEL, IL 62863	Mineral (1/12)		56
PATSY J. RANDOLPH	314 E 11TH STREET, MT. CARMEL, IL 62863	Mineral (1/3)		56
KATHERINE B. KENIEPP	631 CHANDLER DRIVE, MT. CARMEL, IL 62863	Mineral (1/3)		56
RONALD E TREECE		Mineral (1/12)		56
TRACY D TREECE		Mineral (1/12)		56
ANGELIA D EVANS		Mineral (1/12)		56
GEORGE FRANKLIN TREECE, ETAL	804 W 6TH STREET, MT. CARMEL, IL 62863	Surface		56
KATHERINE B. KENEIPP	631CHANDLER DRIVE, MT. CARMEL, IL 62863	Mineral (1/3)		57
PATSY J. RANDOLPH	314 E 11TH STREET, MT. CARMEL, IL 62863	Mineral (1/3)		57
GOEORGE F. TREECE	804 W 6TH STREET, MT. CARMEL, IL 62863	Mineral (1/12)		57

TABLE 1.5.2
Property Interest Holders Contiguous to the Permit Area

Name	Address	Surface or Mineral Property	Parcel ID	Map ID Reference
RONALD E TREECE		Mineral (1/12)		57
TRACY D TREECE		Mineral (1/12)		57
ANGELIA D EVANS		Mineral (1/12)		57
KATHERINE B. KENEIPP	631CHANDLER DRIVE, MT. CARMEL, IL 62863	Surface		57
PATSY J. RANDOLPH	314 11TH ST., MT. CARMEL, IL 62863	Mineral (1/3)		58
KATHERINE B. KENEIPP	631 CHANDLER DRIVE, MT. CARMEL, IL 62863	Mineral (1/3)		58
GEORGE TREECE	804 W. 6TH STREET, MT. CARMEL, IL 62863	Mineral (1/12)		58
RONALD TREECE		Mineral (1/12)		58
TRACY TREECE		Mineral (1/12)		58
ANGELIA EVANS		Mineral (1/12)		58
PATSY J. RANDOLPH	314 11TH ST., MT. CARMEL, IL 62863	Surface		58

Table 1.5.3
Uncontrolled Interests Within Proposed Boundary

Property Owner (Name)	Map ID Reference	Type of Document	Date of Execution	Identification of the Specific Lands to which the Document Pertains	Explanation of the Legal Rights Claimed (including whether any rights are the subject of pending litigation)	Pending Litigation? Y/N	Check if no legal rights claimed.
Barker Trusts	13 (220 acres)	permit inclusion affidavit	30-Nov-17	See Property Ownership Map, tract 13	right to include in application	no	
Homer Majors	26 (65 acres)	permit inclusion affidavit	8-Dec-17	See Property Ownership Map, tract 26	right to include in application	no	
Sharon Majors	23 (58 acres)	permit inclusion affidavit	4-Dec-17	See Property Ownership Map, tract 23	right to include in application	no	
TOTAL	343 acres (32.2%)						

Received Electronically
Dept Natural Resources
06/01/2020
Office of Mines and Minerals
Land Reclamation Division

PUBLIC NOTICE
FILING OF SIGNIFICANT REVISION

As required by 62 Ill. Adm. Code 1773.13, Vigo Coal Operating Co., LLC 250 Cross Pointe Blvd. Evansville, IN 47715 hereby gives notice that on DATE it filed a Significant Revision for Surface Mining Permits No. 330 & 458 at its Friendsville Mine in Wabash County, Illinois.

The U.S. Geological Survey 7.5 minute quadrangle maps which contain the permit and adjacent area are the Mt. Carmel and Bone Gap, IL quadrangles. More specifically the revision is located within the following legal description:

Township 1 South, Range 13 West, Wabash County:

Section 10	**Part of the S ½ of the NW ¼, Part of the N ½ of the SW ¼, Part of the SW ¼ and the SE ¼ of the Se ¼.**
Section 15	**Part of the E ½ of the NE ¼, Part of the Ne ¼, the SE ¼, the SW ¼ , and the NW ¼ of the SE ¼. NE ¼; SE ¼; NW ¼.**
Section 22	**Part of the E ½ of the NE ¼.**

The permit area is located approximately 2.5 miles west of Mt. Carmel, IL and approximately 2.5 miles north of State Route 15's junction with County Road 700 E. Significant features and local landmarks in the vicinity of the permit area include: County Road 700 E, Wabash 12 Avenue, County Road 1600 N., and County Road 850 E.

Vigo Coal Operating Co., LLC is proposing to add an incised fine course refuse impoundment and to add a developed water resource to the approved reclamation plan.

Vigo Coal Operating Co., LLC also proposes to conduct mining operations within 100 feet of the right of way of Wabash 12 Avenue. Mining operations within this area will include removal of overburden, construction of a fine course slurry cell and pipelines, safety berms & diversion ditches, and soil storage areas.

The permit application is on file and available for inspection at the Illinois Department of Natural Resources Office of Mines and Minerals, and the County Clerk's office for Wabash County, located in the Courthouse at Mt. Carmel, Illinois. This notice will be published on the date of filing a complete copy of the application with the County Clerk and once a week thereafter for a total of four consecutive weeks.

The Illinois Department of Natural Resources has initiated the formal review of the permit application. Any affected members of the public and any governmental agency head or officers may submit comments, objections or requests for informal conferences or

hearings. Any written comments, objections, or requests for informal conferences or public hearings should be directed to the Illinois Department of Natural Resources, Office of Mines and Minerals, Land Reclamation Division, One Natural Resources Way, Springfield, Illinois, 62702-1271.

ENGINEERING CERTIFICATION

I hereby certify the engineering design used in preparation of this application, attachments, and supplements were done by me or under my direct supervision.

I certify that I am familiar with all of the plans, specifications, reports, and maps submitted as part of this application and that said information is accurate.

I certify to the best of my knowledge all such design is in accordance with all applicable local, state and federal laws, rules and regulations.

I further certify that all applicable maps and/or drawings have been individually sealed in accordance with the Professional Engineering Act, 225 ILCS 325/15.

INDIVIDUAL P.E. CERTIFICATION

Edwin Bane Kroeger
Name

062-053473
Illinois Registration Number (Seal)

White Stallion Energy
Firm

250 Cross Pointe Blvd.

Evansville, IN 47715

Address

Signature

618-967-1661
Phone Number

March 24, 2020
Date

PROFESSIONAL DESIGN FIRM CERTIFICATION

Complete if applicable. If not, respond N/A.

_____ As an employee of a Professional Design Firm as defined by the Illinois Department of Financial and Professional Regulation, I certify that the professional design firm is registered and in good standing with the Illinois Department of Financial and Professional Regulation.

Professional Design Firm Name

Professional Design Firm Number

Technical Data Information Sheet

62 Ill. Adm. Code 1777.13

The applicant shall include a comprehensive list of all technical data submitted to support the permit application.
Refer to Operator Memorandum No. 2012-04

TYPE OF DATA	NAME OF PERSON OR ORGANIZATION (COLLECTION)	NAME OF PERSON OR ORGANIZATION (ANALYSIS)	DATES OF COLLECTION	DATE OF ANALYSIS	DESCRIPTION OF METHODOLOGY (COLLECTION)	DESCRIPTION OF METHODOLOGY (ANALYSIS)
SOILS						
SOIL SAMPLING						
SOIL QUALITY ANALYSIS						
HYDROLOGY						
GROUNDWATER QUALITY						
GROUNDWATER QUANTITY						
AQUIFER TESTING/SLUG TESTING						
SURFACE WATER QUALITY						
SURFACE WATER QUANTITY						
ACID-BASE ACCOUNTING						
WILDLIFE						
STREAM AND/OR WETLAND REPORT						
EPHEMERAL STREAM JUSTIFICATION						
T&E REPORT						
INBA AND/OR NLEB PEP						
OTHER PEP's						
ENGINEERING						
GEOTECHNICAL TESTING	Patrick Gould, HLR Engineering	Patrick Gould PE, HLR Engineering			QA/QC Plan	QA/QC Plan
U.G. MINE STABILITY DATA						
REFUSE						
REFUSE QUALITY SAMPLING						
REFUSE QUALITY ANALYSIS						
COAL COMBUSTION MATERIALS						
ASH QUALITY SAMPLING						
ASH QUALITY ANALYSIS						
MISCELLANEOUS						

PART 2: Pre-Mining Information

2.1 Pre-Mining Land Use Information.

2.1.1 Pre-Mining Land Use and Capability Acreages. Complete Table 2.1.1: Pre-Mining Land Use Capability giving the acreage and capability of each land use within the proposed permit area, employing only land use categories of 62 Ill. Adm. Code 1701.5, the "fish and wildlife" land use category must be subdivided as required by Operator Memorandum 2015-01. Use only these land uses for completing the land use maps.

The information shall be broken down with a separate table for each landowner. In addition, the applicant shall complete Table 2.1.1 - Grand Total: Pre-Mining Land Use Capability Summary. This table is a compilation of all Pre-Mining Land Use Capability tables filled out for each individual land owner.

For IBR applications, complete Table 2.1.1: Pre-Mining Land Use Capability for each landowner and update Table 2.1.1 - Grand Total: Pre-Mining Land Use Capability Summary. **[1780.23/1784.15]**

Note: other agencies, such as USACE, may define land uses differently.

Not Applicable

2.1.2 Provide slope measurements to represent existing land surface configuration of proposed permit area. A soils map of medium intensity prepared to NRCS specifications or a contoured aerial photo may be submitted to meet this requirement. **[1779.24/1783.24(l)]**

☐ Check here if using one of the above maps or photos.

Does the Soils Map submitted with the application meet the requirements to provide slope measurements?

☐ YES ☐ NO

If NO, provide a contoured aerial photo for the proposed boundary.

Not Applicable

2.1.3 For any proposed surface coal mining and reclamation operation, has previous mining activity including active, inactive or abandoned underground mine workings along with any mine opening to the surface occurred within the permit and/or adjacent area? **[1816.133/1817.133]**

☐ YES ☐ NO

If YES, complete Table 2.1.3: Previous Mining Activity - Surface Permit Areas and delineate the areas disturbed by previous mining activities, including active, inactive or abandoned underground mine work along with any mine opening to the surface on the Pre-Mining Land Use Map. In addition, the map shall identify areas where surface coal mining operations were conducted prior to August 3, 1977; after August 3, 1977 and prior to May 3, 1978; after May 3, 1978 and prior to February 1, 1983; and any permanent regulatory program permit issued after February 1, 1983. **[1777.14(b); 1779.25(a)(8)/1783.25(a)(8)]**

2.1.3.1 Identify the land uses preceding any type of mining, if known. **[1780.23(a)(1)/1784.15(a)(1)]**

Not Applicable

2.1.4 Is any of the permit area subject to local or county zoning?

☐ YES ☐ NO

If YES, provide a description of the existing land uses and land classifications under local law, if any, for the proposed permit and adjacent areas.

Not Applicable

2.1.5 Provide the location of surface and subsurface man-made features within, passing through, or passing over the proposed permit area on the Pre-Mining Land Use Map. Such features should include, but are not limited to, major electric transmission lines, pipelines, agricultural drainage tile fields, gas and oil wells, and water wells. For gas, oil, and water wells provide the depth, if available, of the well in Table 2.1.5: Oil and Gas Well Information. **[1779.24(e)/1783.24(e)]**

Not Applicable

2.1.6 If any of the land uses changed within the last five (5) years, indicate the acreage and changes of land uses. **[1780.23(a)(1)/1784.15(a)(1)]**

Not Applicable

2.2 Pre-Mining Soils Information. The applicant is strongly recommended to use the USDA Web Soil Survey. The web soil survey has the ability to create a Custom Soil Survey report for the application area which will generate many of the information requirements for pre-mining soils and prime farmland restoration plans which may reference this report. Please note there are extra soil data tables, including Land Classification, Non-irrigated Capability Class, and Vegetation Productivity, and the data from the Soil Property and Qualities tab which must specifically be extracted when creating a custom report.

NOTE: The acreage of the Area of Interest must agree with the permit acreage. This report may be referenced in responding to portions of the required soil information.

2.2.1 The narrative of land capability and productivity shall employ the USDA National Resources Conservation Service's Land-Capability Classification (Agriculture Handbook No. 210) in conjunction with the soil information provided under the published soil survey when completing Part 2.2.9. Optimum levels management productivity information may be found in Bulletin 811. **[1779.21/1783.21].**

NOTE: This Bulletin has periodic updates in a supplemental table.

Not Applicable

2.2.2 A Soils Map shall be provided as required by Part 2.2. The scale of the Soil Map scale must be the same scale as the Pre-Mining Land Use Map and Post-Mining Land Use/Capability Reclamation Map, unless otherwise approved by the Department. Does the submitted Soils Map represent a map developed by the National Resources Conservation Service (NRCS)? **[1779.21/1783.21]**

☐ YES ☐ NO

If YES, complete the following:

2.2.2.1 Has the NRCS soil map been modified in any way except by a change in scale?

☐ YES ☐ NO

If YES, explain the nature of the changes.

Not Applicable

2.2.3 For surface mines, delineate on the Soils Map, the area which will incur actual mining (removal of overburden and/or deposition of overburden for the extraction of coal). Identify any areas proposed to remain undisturbed. **[1780.14]**

For underground mines, identify any areas proposed to remain undisturbed. **[1784.23]**

Not Applicable

2.2.4 Are any of the identified map units correlated as prime farmland by NRCS criteria?

☐ YES ☐ NO

If YES, explain and provide documentation to meet the requirements of 62 Ill. Adm. Code 1785.17 or 1823.11, if a request for grandfathering, negative determination or underground mine exemption is sought. If prime farmlands exist which will not meet the exemption criteria described above, a prime farmlands restoration plan must be provided in Parts 8.2 through 8.4. **[1785.17(b)/1823.11]**

Not Applicable

2.2.5 Indicate the average topsoil thickness of each of the Soil Map units to be affected. Locate on Soils Map the test holes for soil horizon thickness sampling. Provide the average and methodology for determining the average pre-mining topsoil thickness in inches for: **[1779.21/1783.21]**

- Non-cropland capability _____ inches
- High capability _____ inches
- Prime Farmland _____ inches

2.2.6 List the soil types and acreages of areas that will require the B and/or portions of the C horizon to be removed and replaced in order to establish the root medium necessary to achieve soil productivity consistent with the proposed post-mining land use. Alternatively, a narrative description explaining why specific soil type acres information for reclamation plan achievement is not necessary may be provided. **[1780.18(b)(4)/1784.13(b)(4)]**

Not Applicable

2.2.7 Are selected overburden materials proposed to be used in lieu of or as a supplement to the A-horizon?

☐ YES ☐ NO

If YES, provide the appropriate information required by 62 Ill. Adm. Code 1779.21(b) or 1783.21(b).

Not Applicable

Also, identify the source of the substitute materials and the topsoil to be substituted away from (not removed) on a separate soils map, labeled Topsoil Substitution Map and/or describe the area in narrative form. **[1780.14/1784.23]**

Not Applicable

2.2.8 Explain why the proposed plan will provide the best available material of equal or better quality than present topsoil or surface existing material. **[1816.22(b)/1817.22(b)].** This section must be addressed when affecting previously disturbed areas if the surface soil is not to be salvaged. If topsoil substitutes or supplements are proposed, a demonstration of their suitability shall be required based on analysis of thickness of soil horizons, total depth, texture, percent coarse fragments, pH, and aerial extent of the different kinds of soils. The Department shall require other chemical and physical analyses, field-site trials, or greenhouse tests if determined to be necessary or desirable to demonstrate the stability of the topsoil substitutes or supplements. **[1780.18(b)(4)/1784.13(b)(4); 1779.21/1783.21]**

Not Applicable

2.2.9 Complete Table 2.2.9: Soils Information Chart acreage for each of the map units (soil type and slope classification) of prime farmland, high capability (include grandfathered and negatively determined prime farmland) and non-cropland capability land with respect to areas within the permit area. All soils previously disturbed by home sites, farmsteads, roads, etc., shall be tabulated as non-cropland capability and need not undergo a negative determination. The Soil Information Chart must be broken out by land owner, if there is more than one. **[1779.21(a)/1783.21(a); 1785.17]**

Not Applicable

Optional-addition: If applicable, quantify map units acreage values on Table 2.2.9: Soils Information Chart for areas which will not be disturbed. **[1779.21(a)/1783.21(a)]**

2.3 Areas Where Mining is Limited or Prohibited.

Complete Table 2.3: Areas Prohibiting or Limiting Mining Operations for each structure (occupied dwelling, public building, school, church, community/institutional building, public park, cemeteries, public road) identified in question 2.3.2 through 2.3.9 with respect to areas where mining is prohibited. Indicate if the buffer zone will be in effect or if a waiver is obtained. **[1761.11(c)(d)(e)(f)(g)]**

2.3.1 Does the proposed permit area include areas designated unsuitable for surface coal mining and reclamation operations, or under study for designation in an administrative proceedings as unsuitable for surface coal mining and reclamation operations? **[1773.15(c)(3)]**

☐ YES ☒ NO

If YES, identify these areas on the Pre-Mining Land Use and Operations Map.

2.3.2 Does the proposed permit area include lands within boundaries of the National Park System, National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, and National Recreation Areas, etc.? **[1761.11(a)]**

☐ YES ☒ NO

If YES, identify these areas on the Pre-Mining Land Use and Operations Map.

2.3.3 Does the proposed permit area include lands within the boundaries of any national forest? **[1761.11(b)]**

☐ YES ☒ NO

If YES, identify these areas on the Pre-Mining Land Use and Operations Map.

2.3.4 Are there any publicly owned parks or any places included in the National Register of Historic Places on or within 1,000 feet of the proposed permit area? **[1761.11(c)]**

☐ YES ☒ NO

If YES, identify these areas on the Pre-Mining Land Use and Operations Map.

2.3.5 Does the operations plan propose any surface coal mining operations within 100 feet measured horizontally of the outside right-of-way line of any public road? **[1761.11(d)]**

☒ YES ☐ NO

If YES, complete the following:

2.3.5.1 Describe the measures to be used to insure that the interest of the affected public and landowners will be protected. **[1761.11(d)(2)(B)]**

Prior to commencing mining operations within 100 feet of any public road, a five foot high safety berm will be constructed along the public right of way. Also, signs will be erected at appropriate locations to inform the traveling public of the potential dangers concerned with crossing the berms.

2.3.5.2 In the public notice of the application required in the Cover Sheet, identify the public road(s), describe the activities to be conducted within 100 feet of the road(s), and indicate the opportunity for a public hearing on this matter. **[1761.11(d)(2)(A)]**

See Attachment 1.6.2 Public Notice.

2.3.6 Does the proposed permit area include any public roads which are to be removed, relocated or closed? **[1761.14]**

☐ YES ☒ NO

If YES, complete the following:

2.3.6.1 Submit the necessary approvals of the authority with jurisdiction over the public road. **[1761.14(b)(2)]**

Not Applicable

2.3.6.2 If a public road is to be replaced or re-located within the permit area, provide evidence that a bond has or will be posted with the authority with jurisdiction over the public road. If such bond has not been nor will be posted, address road replacement costs in Table 9.5.1.14: Public Road Replacement.

Not Applicable

2.3.6.3 Describe the measures to be used to insure that the interest of the affected public and landowners will be protected. **[1761.14(b)(5)]**

Not Applicable

2.3.6.4 As required in the Cover Sheet, the public notice shall identify the public road(s) to be removed, relocated or closed, and indicate the opportunity for a public hearing on this matter. **[1761.14(b)(3) and (4)]**

Not Applicable

2.3.7 Does the operations plan propose any surface coal mining operations within 300 feet measured horizontally from any occupied dwelling other than a haul road or access road which connects with an existing public road on the side of the public road opposite the dwelling? **[1761.11(e)]**

☐ YES ☒ NO

If YES, include a waiver from the owner of the dwelling meeting the following requirements: **[1761.15]**

- The waiver shall be by lease, deed, or other conveyance from the owner of the dwelling. The waiver must clarify that the owner and signator had the legal right to deny mining and knowingly waived that right.
- Provide proof that the waiver has been properly filed in public property records pursuant to State laws.

If NO, and occupied dwellings are located either within the permit boundary or within 300 feet of the permit boundary but no disturbance is proposed within 300 feet, then indicate 300 foot buffer markers around all applicable occupied dwellings on the Operations Map

NOTE: If a valid waiver was obtained before August 3, 1977 from the owner of an occupied dwelling to conduct operations within 300 feet of the dwelling, a new waiver need not be obtained. ***[1761.15(c)]***

Not Applicable

2.3.8 Does the operations plan propose any surface coal mining operations within 300 feet measured horizontally of any public building, school, church, community or institutional building or public park? **[1761.11(f)]**

☐ YES ☒ NO

2.3.9 Are there any public or private cemeteries or Indian burial grounds or other areas where human bodies are interred located in or within one hundred (100) feet of the proposed permit area? **[1761.11(g)]**

☐ YES ☒ NO

If YES, locate on the Pre-Mining Land Use, Operations and Post-Mining Land Use/Capability Reclamation Plan Maps the boundaries of the above-referenced areas and indicate a 100 foot buffer zone around the cemetery or burial ground. **[1779.24(j)/1783.24(j)]**

Not Applicable

2.3.10 Are valid existing rights claimed for any part of the permit area? **[1761.5; 1761.16]**

☐ YES ☐ NO

If YES, complete Part 2.6 or 2.7 to substantiate the claim.

2.4 Public Parks, Historic Properties.

2.4.1 Provide a description of the historic properties (archeological sites and/or historic standing structures) listed or potentially eligible for listing on the National Register of Historic Places and any known archeological features within the proposed permit and adjacent areas. The description of the historic properties occurring within the permit area and adjacent areas shall be based upon available data. If studies have been completed and submitted for review prior to this application, attach a copy of the results of that review. For significant revisions other than shadow area revisions, attach a copy of the IHPA review. Also, with regard to historic properties, provide the anticipated start date when the area is to be affected. **[1779.12/1783.12]**

Not Applicable

2.4.2 If investigations are underway or under review, reference the current status. **[1779.12(b)/1783.12(b)]**

NOTE: Studies which are submitted to the Department shall be submitted as a separate document (3 hard copies, plus one on disk in pdf format or other format as directed by the Department)

Not Applicable

2.4.3 If historic properties are to be avoided, provide a map showing their location in lieu of either a Phase I evaluation or a Phase II evaluation. A qualified archaeologist shall create the map and identifying field markings to be employed to ensure the site(s) will not be disturbed by surface coal mining and reclamation operations. The map is to be submitted in duplicate in separate cover from the rest of the application and labeled Historic Properties Protection Map. The Department will hold the map as a confidential document. If a revision proposes a disturbance not previously identified, identify its location to any avoidance area. **[1773.13(d)(3)].**

Not Applicable

2.4.4 Provide a plan for publicly owned park(s), or place(s) listed on the National Register of Historic Places, that may be adversely affected by the proposed operation describing the measures to be employed: **[1780.31/1784.17]**

- To prevent adverse impacts caused by surface mining related activities including, but not limited to, loss or destruction of historic properties; or

- If valid existing rights exist or joint agency approval is to be obtained under 62 Ill. Adm. Code 1761.17(d), to minimize adverse impacts. If valid existing rights are to be claimed, complete Sections 2.5 or 2.6 of this application, whichever is applicable.

Not Applicable

2.5 Valid Existing Rights (VER) Good Faith/All Permits Standard. [1761.16(b)(2)]

The applicant must provide a property rights demonstration under 62 Ill. Adm. Code 1761.5(a) if the applicant's request for VER is based upon the good faith/all permits standard in Section 1761.5(b)(1). This demonstration must include the following items: **[1761.16(b)]**

2.5.1 A legal description of the land to which the request pertains.

Not Applicable

2.5.2 Complete documentation of the character and extent of the current interests in the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.5.3 A complete chain of title for the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.5.4 A description of the nature and effect of each title instrument that forms the basis for the request, including any provision pertaining to the type of method of mining or mining-related surface disturbances and facilities.

Not Applicable

2.5.5 A description of the type and extent of surface coal mining operations that the applicant or permittee claims the right to conduct, including the method of mining and mining-related surface activities and facilities, and an explanation of how those operations would be consistent with State property law.

Not Applicable

2.5.6 Complete documentation of the nature and ownership, as of the date that the land came under the protection of 62 Ill. Adm. Code 1761.11, of all property rights for the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.5.7 Names and addresses of the current owners of the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.5.8 If the coal interests have been severed from other property interests, documentation that the owners of other property interests in the land to which the request pertains have been notified and provided a minimum of 14 days to comment on the validity of the applicant or permittee's property rights claims.

Not Applicable

2.5.9 Provide any comments received in response to the notification provided under Part 2.5.8. above.

Not Applicable

2.5.10 Approval and issuance dates and identification numbers for any permits, licenses, and authorizations that the applicant, permittee or a predecessor in interest obtained before the land came under the protection of 62 Ill. Adm. Code 1761.11.

Not Applicable

2.5.11 Application dates and identification numbers for any permits, licenses, and authorizations for which the applicant, permittee or a predecessor in interest submitted an application before the land came under the protection of 62 Ill. Adm. Code 1761.11.

Not Applicable

2.5.12 An explanation of any other good faith effort that the applicant, permittee or a predecessor in interest made to obtain the necessary permits, licenses, and authorizations as of the date that the land came under the protection of 62 Ill. Adm. Code 1761.11.

Not Applicable

2.6 Valid Existing Rights (VER) Needed for and Adjacent Standard. [1761.16(b)(3)]

The applicant must provide a property rights demonstration under 62 Ill. Adm. Code 1761.5(a) if the applicant's request for VER is based upon the needs for and adjacent standard in Section 1761.5(b)(1). This demonstration must include the following items: **[1761.16(b)]**

2.6.1 A legal description of the land to which the request pertains.

Not Applicable

2.6.2 Complete documentation of the character and extent of the current interests in the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.6.3 A complete chain of title for the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.6.4 A description of the nature and effect of each title instrument that forms the basis for the request, including any provision pertaining to the type of method of mining or mining-related surface disturbances and facilities.

Not Applicable

2.6.5 A description of the type and extent of surface coal mining operations that the applicant or permittee claims the right to conduct, including the method of mining and mining-related surface activities and facilities, and an explanation of how those operations would be consistent with State property law.

Not Applicable

2.6.6 Complete documentation of the nature and ownership, as of the date that the land came under the protection of 62 Ill. Adm. Code 1761.11, of all property rights for the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.6.7 Names and addresses of the current owners of the surface and mineral estates of the land to which the request pertains.

Not Applicable

2.6.8 If the coal interests have been severed from other property interests, documentation that the owners of other property interests in the land to which the request pertains have been notified and provided a minimum of 14 days to comment on the validity of the applicant or permittee's property rights claims.

Not Applicable

2.6.9 Provide any comments received in response to the notification provided under Part 2.6.8 above.

Not Applicable

2.6.10 Explain how and why the land is needed for and immediately adjacent to the operation upon which the request is based. This explanation shall include a demonstration that prohibiting expansion of the operation onto that land would unfairly impact the viability of the operation as originally planned before the land came under the protection of 62 Ill. Adm. Code 1761.11.

Not Applicable

2.7 Valid Existing Rights (VER) Standards for Mine Roads. [1761.16(b)(4)]

If the request relies upon one of the standards for roads in 62 Ill. Adm. Code 1761.5(c)(1) through (c)(4), satisfactory documentation of one or more of the following must be submitted showing that: **[1761.5(c)]**

2.7.1 The road existed when the land upon which it is located came under the protection of 62 Ill. Adm. Code 1761.11, and the applicant has a legal right to use the road for surface coal mining operations.

Not Applicable

2.7.2 A properly recorded right of way or easement for a road in that location existed when the land came under the protection of 62 Ill. Adm. Code 1761.11, and, under the document creating the right-of-way or easement, and under any subsequent conveyances, the applicant has a legal right to use or construct a road across that right of way or easement to conduct surface coal mining operations.

Not Applicable

2.7.3 A valid permit for use or construction of a road in that location for surface coal mining operations existed when the land came under the protection of 62 Ill. Adm. Code 1761.11.

Not Applicable

2.7.4 Valid existing rights exist under 62 Ill. Adm. Code 1761.5(a) and (b).

Not Applicable

PART 3: Mining Operations Plan

3.2.5 Buried Pipelines. Are pipelines proposed to be buried within the permit boundary? **[1816.133/1817.133]**

☒ YES ☐ NO

If YES, locate pipeline corridors on the operations map. Provide a description of the pipeline operation including but not limited to: the material to be transported, the type, diameter and wall thickness of the pipe and the depth of burial to the top of pipe. Indicate whether the pipe is to be removed when no longer needed. It is recommended that pipeline burials follow the Illinois Department of Agriculture guidelines if they are intended to be left in place permanently. IDOA guidelines for different types of pipelines may be found at:
https://www2.illinois.gov/sites/agr/Resources/LandWater/Documents/pipelinestandardspolicies.pdf#search=pipeline
https://www2.illinois.gov/sites/agr/Resources/LandWater/Documents/waterandsewerlines.pdf

The location of the pipelines can be found on the Operations Map – Map 1 & Map 2. The applicant is proposing to construct a slurry cell. The slurry disposal system will be a closed circuit. Water will be recirculated from proposed Slurry Cell #4 and utilized at the preparation plant for reuse. The discharge and return lines will consist of 6-inch DR17 pipe with a wall thickness of a 1/2 inch. The pipelines will not be removed after use and will be buried with a minimum cover of 5 feet.

3.10 Coal Preparation.

3.10.1 Will processing of coal take place within the proposed permit area? **[1780.11(b)(3)/1784.11(b)(3)]**

☐ YES ☒ NO

If YES, locate processing facilities on the Operations Map and give a general description of the coal processing operation at this facility. **[1780.14(b)(4)/1784.23(b)(4)].**

Not Applicable

If NO, and coal preparation plants are not located within the permit area, the applicant shall explain where coal processing would occur. The applicant is required to possess or obtain a separate permit for coal preparation plants that are not located within the proposed permit area**. [1785.21; 1827]**

The coal preparation plant is located within the previously approved 330 Permit.

3.10.2 Will in-situ processing activities be conducted? **[1785.22]**

☐ YES ☒ NO

If YES, provide information to assure compliance with 62 Ill. Adm. Code 1785.22 and 1828. **[1785.22; 1828]**

Not Applicable

3.10.3 Provide an annual estimation of the volume of both coarse and fine coal waste streams generated. **[1780/1784.11(b)(4)]**

**Course refuse will not be disposed of within Slurry Cell #4.
Approximately 129,254 cu. yards of fine coal slurry will be generated and deposited into Slurry Cell #4 on a yearly basis.**

3.10.4 Describe the processing water (fresh water/make-up water) and slurry line circuitry. Incorporate flow diagrams as necessary. Provide locations of all processing water transport lines and slurry transport lines on the Operations Map. **[1780.11(b)/1784.11(b)]**

The slurry disposal system will be a closed circuit. Water will be recirculated from proposed Slurry Cell #4 and utilized at the preparation plant for reuse. The discharge and return lines will be trenched and buried 4' underneath Wabash 12 Avenue. The discharge and the intake line will be placed accordingly to prevent the return of the fines to the processing plant. Curtains maybe also be employed to ensure the return of clarified water to the plant.

3.10.5 What safeguards are provided to prevent the discharge of slurry fines and untreated slurry water during emergency situations (e.g. power outages, mechanical equipment breakdown, plant shutdowns, etc.)? Indicate where the slurry would go by gravity flow in the event of an emergency discharge, and the environmental impact this would have **[1780.21(h)/1784.14(g)]**

Fine coal refuse is to be delivered to Slurry Cell #4 as a liquid slurry. The slurry deposited into the cell will have a maximum elevation of 468 msl and will be monitored on a regular basis. The slurry line will be maintained and inspected periodically to prevent the occurrence of an accidental discharge. Additionally, the disposal cell will be up gradient of the proceeding plant, inspection of pressure gauges in the preparation plants' control center will allow plant personnel to monitor the flow of the refuse material. The pumps utilized will be sized appropriately by a consultant with expertise in pumps. Should an accidental discharge outside the disposal site occur, the slurry will be controlled within the mines sediment control system of diversions ditches and sediment structures. Vigo Coal will promptly clean up the discharge material with an excavator or a vac truck, whichever is most practical, and haul the material to the approved disposal area.

3.11 Coal Processing Waste and Underground Development Waste.

3.11.1 Will coal processing waste and/or underground development waste be disposed of within the proposed permit area?

☒ YES ☐ NO

If NO, explain how coal processing waste and underground development waste will be handled and disposed?

Not Applicable

If YES, complete Table 3.11.1: List of Coal Waste Materials to be Disposed within the Permit Area providing analytical data to describe the nature of all coal processing waste and underground development waste material that will be disposed within the proposed permit area.

Note: If this is a new facility and no processed refuse has been generated, provide an estimated analysis in the table and a discussion of the basis for the assumptions in the space below. Also, please note the Department will require submittal of actual analytical results of the refuse material within 60 days after the preparation facility is operational.

Not Applicable

Table 3.11.1: List of Coal Waste Materials to be Disposed within the Permit Area

Type of material includes but is not limited to *Coarse Coal Refuse Filter Cake, Fine Coal Refuse (Slurry), immediate floor and roof rock potentially removed and not sent to the preparation plant with coal.*

Type of Material	Source Mine Permit and Preparation Plant	Potential Acidities	Net Neutralization Potential
Coarse Coal Refuse	IDMM Permit 330	105.6	-80.9
Fine Coal Refuse		63.1	-30.0

3.11.2 Is Disposal of Coal Waste in Underground Workings proposed in this application?

☐ YES ☒ NO

If YES, complete and include Part 14: Disposal of Coal Waste in Underground Workings

3.12 Coal Refuse Disposal Area. Is the construction or modification of a Coal Refuse Disposal Area proposed in this application?

☒ YES ☐ NO

If YES, complete the following

3.12.1 Complete Table 3.12.1: List of Coal Refuse Disposal Areas to be Constructed or Modified for each Coal Refuse Disposal Area to be constructed or modified with this application.

Table 3.12.1 List of Coal Refuse Disposal Areas to be Constructed or Modified.

Name of Facility	Slurry Cell #4		
***Type of Facility** **(Coal Refuse Pile, Coal Slurry Waste Impoundment)**	Incised Slurry Impoundment		
Latitude (DD)	38.4445		
Longitude (DD)	87.8502		
Approx. Start of Construction (month/yr)	July 1, 2020		
Estimated Lifespan			

Coarse refuse	0 years		
Slurry	5 years		
Surface Acreage footprint	10.8		
Total Coarse Coal Refuse Storage Volume (cubic yards)	0		
Total Fine Coal Refuse Storage Volume (cubic yards)	646269.07		
***Dam Class (According to TR-60, if applicable)**	Not Applicable		
***Hazard Classification (According to MSHA determination, if applicable)**	Not Applicable		
Associated NPDES Permit	IL0073636		

3.12.2 Design and Construction Details of Coal Refuse Disposal Areas. Coal mine waste shall be disposed of in compliance with requirements of 62 Ill. Adm. Code 1816.81/1817.81 through 1816.84/1817.84.

3.12.2.1 Provide location and describe refuse disposal capacity requirements, facility configuration/staging and scheduling in a detailed construction plan. The plan shall include: acreage of disposal and borrow areas associated with the coal waste disposal area, engineering calculations, cross sections, maps, drawings and design certification for each proposed structure. **[1780.14(b)(8)/1784.23(b)(7); 1816/1817.81(c)]**

See Attachment 3.12.2.1 and Attachment 4.10. Borrow areas are not proposed for the construction of the cell.

3.12.2.2 Provide measures to be taken to: control surface drainage, provide surface area stabilization and minimize erosion of the coarse refuse disposal facility and of areas that receive runoff from the coarse refuse disposal facility. Include detail engineering design of all proposed surface drainage control structures. **[1816/1816.81(a)(1); 1816/1817.83(a); 1816.84/1817.84(d)]**

Diversion ditches will be constructed to reroute surface water around Slurry Cell #4 to prevent erosion and to protect the liner. See Attachment 5.3.1 for the designs.

3.12.2.3 Provide measures that will be taken to ensure mass stability and prevent mass movement of the structure during and after construction. **[1816/1817.49(a)(4); 1816.81(a)(2)/1817.81(a)(2)]**

The proposed structure will be completely incised which will ensure stability and prevent movement.

3.12.2.4 Provide all necessary on-site investigations results, test borings, and laboratory results of foundation material and coal waste that was used to determine the design requirements for the foundation stability of the coarse refuse disposal area and/or structure as Attachment 3.12.2.4. **[1816/1817.49(a)(6); 1816/1817.81(d)]**

See Attachment 4.10.

3.12.2.5 For coal processing waste dams and embankments meeting the Mine Safety and Health Administration (MSHA) size criteria, each design and operations plan shall comply with the requirements of MSHA 30 CFR 77.216-1 and 77.216-2.

3.12.2.5.1 Is the applicant proposing to construct or modify a coal waste disposal structure that impounds water and/or slurry to an elevation of five (5) feet or more above the upstream toe of the structure and can have a storage volume of 20 acre-feet or more?

☐ YES ☒ NO

3.12.2.5.2 Is the applicant proposing to construct or modify a coal waste disposal structure that impounds water and/or slurry to an elevation of twenty (20) feet or more above the upstream toe of the structure?

☐ YES ☒ NO

If the answer to either above is YES, the applicant shall provide in this application the plan submitted to the District Manager of the Mine Safety and Health Administration (MSHA) under 77.216 insofar as the MSHA informational design standard requirements are duplicative of the Department's requirements. **[1816/1817.49(a)(2)]**.

3.12.3 Operation and Maintenance of Coal Refuse Disposal Areas.

3.12.3.1 Describe measures to be taken to safely operate the coal refuse disposal area including but not limited to: Scope and frequency of inspections, maintenance of embankments and liners, controls to ensure compaction standards and maintenance of runoff conveyance and discharge structures **[1816/1817.81(a)(4)]**

The slurry cell will be inspected on a monthly basis. The inspector will monitor fill volume, erosion, and the surface water diversions. Any deficiencies noted will be repaired as soon as conditions allow.

3.12.3.2 For all coal waste disposal areas explain measures to be taken to ensure that final disposal facility is suitable for reclamation. **[1816/1817.81(a)(3)]**

The slurry cell will be monitored on a monthly basis to ensure not to over fill the cell. The discharge line will be moved frequently to evenly fill the cell in preparation for final reclamation. Bathymetric surveys may also be utilized to monitor the storage capacity.

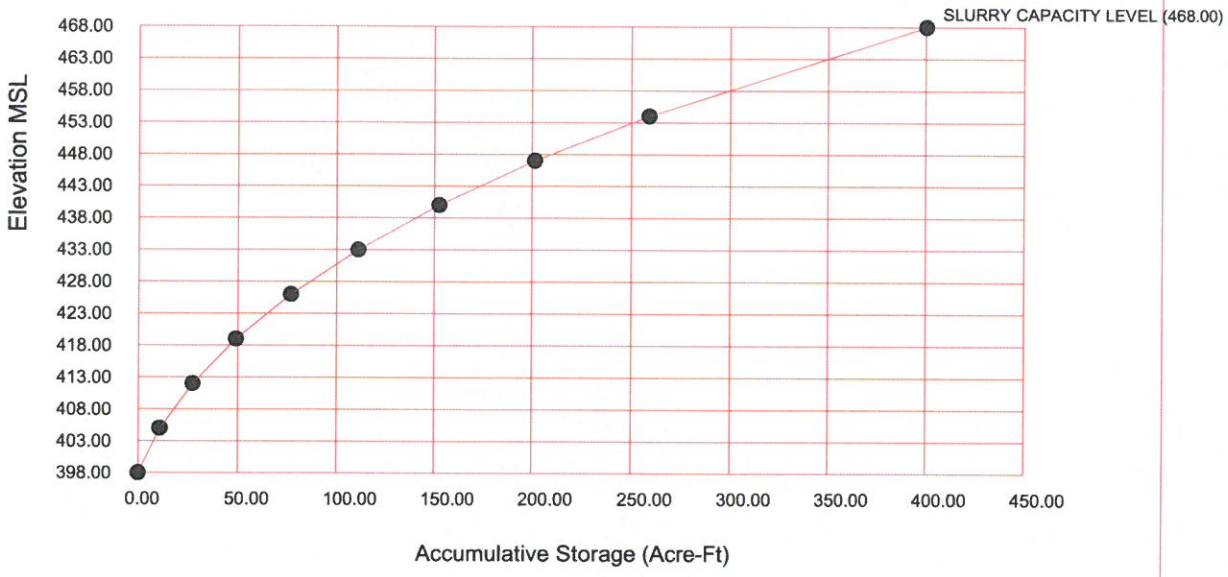
3.12.3.3 Provide the emergency guidelines that will be followed in the case that a potential hazard develops associated with the coarse refuse disposal area(s) being discussed. **[1816/1817.81(e)]**

Not Applicable – The proposed slurry cell is for fine coal refuse.

PERMIT 458

Stage Storage Curve

Slurry Impoundment #4



Storage volume computations

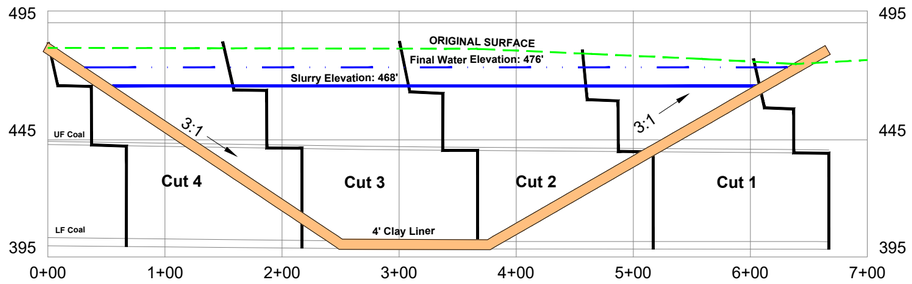
Slurry Impoundment #4

ELEV. (ft)	Width (ft)	LENGTH (ft)	AREA (ac)	AVG. AREA (ac)	INTERVAL (ft)	STORAGE (ac-ft)	ACC. STORAGE (ac-ft)	STAGE INTERVAL (ft)
398.00	N/A	N/A	0.2892					
405.00	N/A	N/A	1.9722	1.1307	7.00	10.8514	10.8514	7.00
412.00	N/A	N/A	2.7402	2.3562	7.00	16.5754	27.4268	14.00
419.00	N/A	N/A	3.5852	3.1627	7.00	21.8485	49.2754	21.00
426.00	N/A	N/A	4.4501	4.0176	7.00	27.7389	77.0142	28.00
433.00	N/A	N/A	5.3900	4.9200	7.00	34.2987	111.3129	35.00
440.00	N/A	N/A	6.4986	5.9443	7.00	41.3770	152.6899	42.00
447.00	N/A	N/A	7.6252	7.0619	7.00	48.9905	201.6803	49.00
454.00	N/A	N/A	8.7945	8.2098	7.00	57.3118	258.9922	56.00
468.00	N/A	N/A	11.4787	10.1366	14.00	141.5888	400.5810	70.00

Horiz. scale: 1"=100'

Vert. scale 1"=50'

A.



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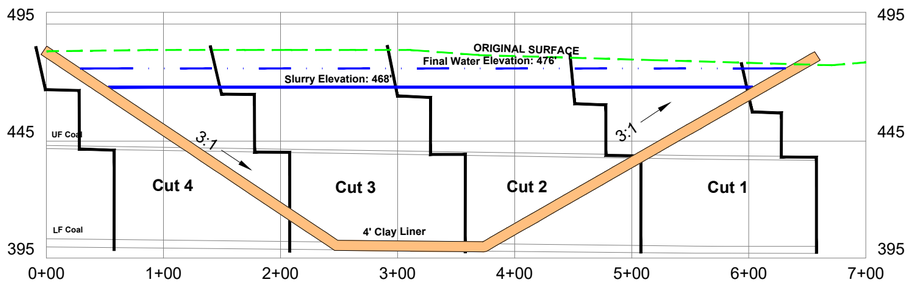

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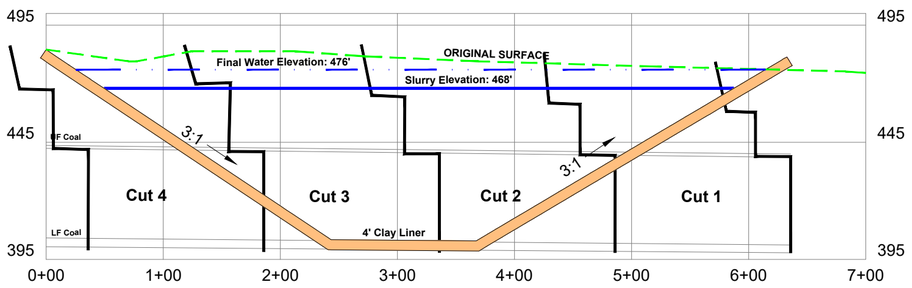
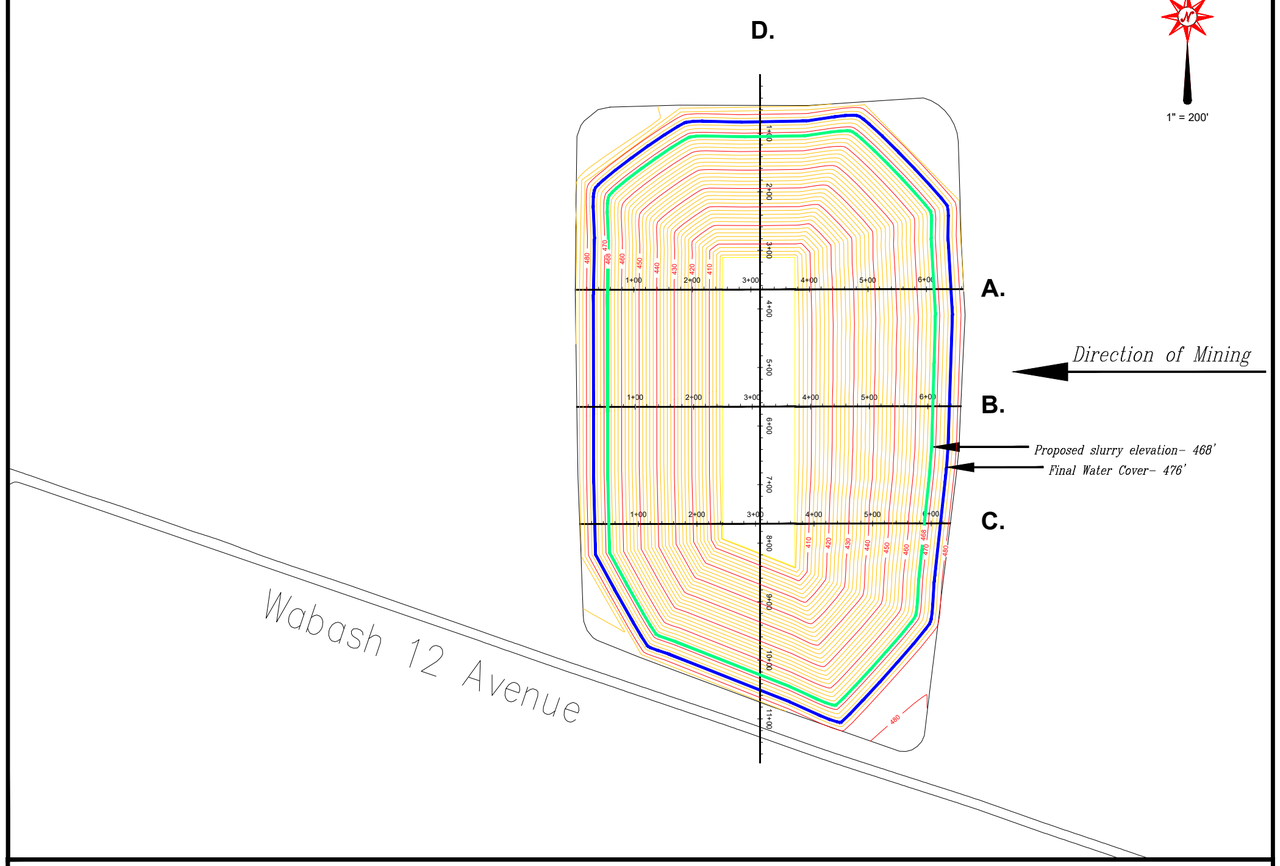


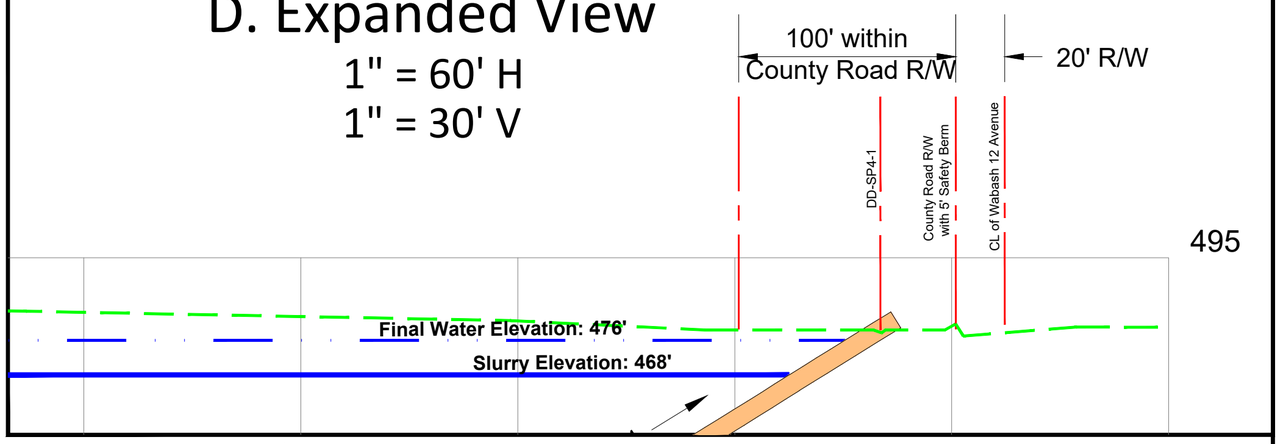
D.

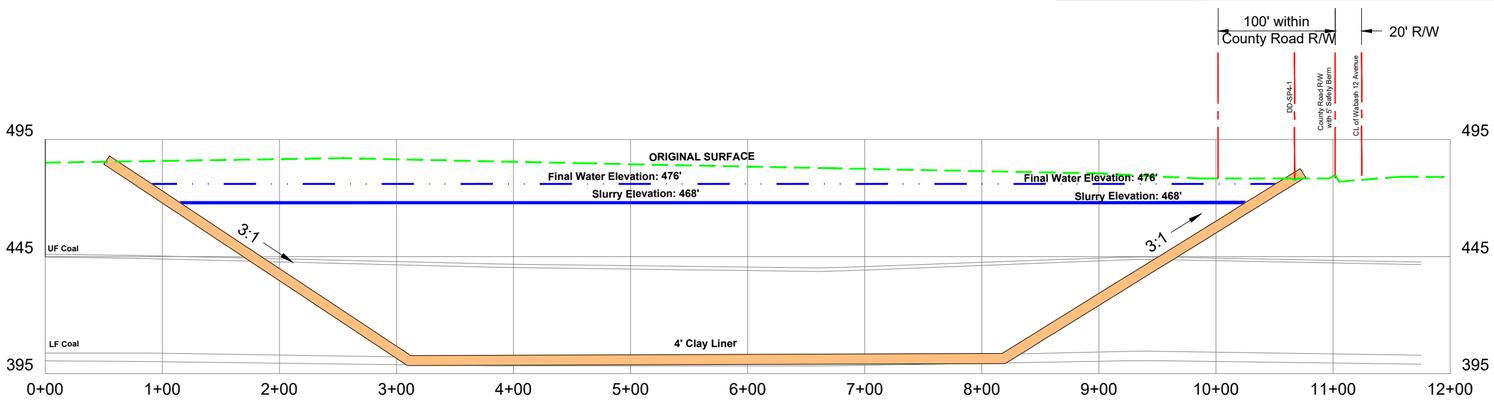


D. Expanded View

1" = 60' H

1" = 30' V





Attachment 3.12.2.1

PART 4: Hydrologic and Geologic Information

4.3.3 Provide chemical analyses of all strata, including the coal seam(s) (both intended to be mined, undisturbed or spoiled) through either the strata immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The analyses shall identify those strata that may contain acid or toxic-forming or alkalinity-producing materials and determine their content and the net-neutralization potential on a weighted basis. **[1780.22(b)(2)(B) & (c)/1784.22(b)(2)(B) & (c)]**

For carbon recovery operations, total sulfur and pyritic sulfur analyses must be performed on the materials to be recovered.

For waste disposal operations, chemical analysis of the fine and coarse refuse waste streams shall be provided, including the identification of acid or toxic-forming or alkalinity-producing materials and determine the content and the net-neutralization potential on a weighted basis.

The nature of the coal processing operation proposed at the Friendsville Mine will generate a coarse coal waste byproduct stream and a fine slurry waste stream. The coal waste by-product anticipated to be generated by the coal processing operation will consist of roof and floor out of seam dilution associated with loading the coal seams; and shales, coal partings and pyritic materials separated from the coal as it is screened, sized, and processed through the processing plant. The type of rock comprising out of seam dilution (OSD) will primarily be shales and/or underclays. Because of the type rock, coal and mineral matter involved, net neutralization potentials of the OSD can be expected to range from both the positive to negative side of the acid-base spectra. When the refuse consists primarily of a combination of black shales, coal shale partings, and pyritic materials, negative (acid) net neutralization potentials can be expected. Extremes of the negative net neutralization potentials can range from slightly less than negative to a maximum of about 25 tons calcium carbonate equivalent per 1000 tons of refuse material. The information submitted in Attachment 4.3.3 in the original permit gives the net neutralization potential for the immediate roof and floor materials which would comprise the majority of the breaker rock. In seam reject can also consist of materials with varying net neutralization potential. Reject from float/sink analysis performed on exploratory coal samples indicate the net neutralization to range from 56 to 87 tons calcium carbonate equivalent per 1000 tons of refuse material.
In addition to the above coal refuse, non-coal waste may also be disposed of in the mined out area. All non-hazardous waste materials generated as a by-product of mining activities (excludes all RCRA Subtitle C wastes) may be disposed of in the active pit. Such wastes include, but are not limited to scrap steel, lumber, wire rope and other combustible materials. Net neutralization potential information is not applicable to the non-coal waste constituents.

4.5 Groundwater Monitoring Program. [1780.21(i)/1784.14(h)]

4.5.1. Describe in detail a proposed monitoring plan based upon the PHC that will measure the amount and duration of any changes to the groundwater system resulting from the mining operation.

The proposed groundwater monitoring plan shall describe how the collected groundwater monitoring data will be used to determine if impacts are occurring and what steps will be taken by the operator.

Provide a Sampling and Analysis Plan (SAP) that includes the methods/steps of well sampling, well analysis and data reporting as an attachment to this application part.

Parameters to be monitored are given in Table 4.5.1 Monitoring shall be on a quarterly basis **unless otherwise approved by the Department**, with reports due within one month of the end of each quarter as follows:

Scheduled Period	From – To	Report Due
1st Quarter	Jan. 1 – Mar. 31	May 1
2nd Quarter	Apr. 1 – Jun. 30	Aug 1
3rd Quarter	Jul. 1 – Sept. 30	Nov 1
4th Quarter	Oct. 1 – Dec. 31	Feb 1

Where approved, annual monitoring shall be conducted during the 2nd quarter only; semi-annual monitoring shall occur during the 2nd and 4th quarters only.

NOTE: At a minimum, background data collection shall occur on a bi-monthly (every two months) basis over the course of one year (12 consecutive months). Groundwater monitoring shall continue throughout the permitting process at the same frequency at which background data collection occurred.

The NPDES permit for the mine includes a Construction Authorization for monitoring wells that establishes a procedure for calculation of variance and standard deviation from the individual well background data for each parameter analyzed to check for statistically significant changes in groundwater quality from that established during the background period. During the operations and reclamation phase for the mine, each well is monitored quarterly. The procedure established by the NPDES permit requirement will identify possible changes of significance in groundwater quality near the mine permit lines.

Should groundwater monitoring during or after mining indicate a trend toward non-compliance with applicable regulations, involved agencies will be contacted for consultation in the development of a remedial action plan. Steps taken past the consultation process will be dependent on the nature and extent of the anticipated non-compliance issue, but assistance from the agencies and other professionals will be sought and complied with.

Additionally and relative to the PHC on groundwater, mining operations are not expected to have a negative effect on water wells outside the mine permit area. In the unlikely event that the mining operation should cause a temporary dewatering of a residential water supply, a source suitable for the intended purpose will be provided until the existing water supply is recharged. Should the impact on a residential supply be determined to be permanent, that supply will be replaced with a source of similar or better quality as the existing source. Should the proposed mining and/or subsequent reclamation operations result in a substantial case of contamination, diminution, or interruption of a surface water or groundwater source within or directly contiguous to the proposed permit area, the applicant will develop or utilize an alternative water source as replacement for the disrupted source, including providing an interim source between water loss and replacement. Alternative sources of water include but are not limited to the following: 1) surface water impoundments, 2) local municipal or rural water supplies, 3) drilling replacement well(s) to

formations exhibiting hydraulic characteristics suitable for water withdrawal and use, 4) treatment of water to attain usable quality, 5) haulage of water, etc.

See Attachment 4.5.1, Sampling and Analysis Plan

4.5.2 Provide a comprehensive list of ALL existing, proposed and plugged/destroyed/damaged groundwater monitoring wells for the entire facility. Complete Table 4.5.2. **[1816.41(c)/1817.41(c)]**

The permittee is proposing to add wells GW-36 (unconsolidated) which is upgradient & GW-37 (spoil) which is downgradient to monitor the areas adjacent to the proposed slurry cell. See Attachment 4.5.2, Monitoring Well Diagrams.

4.5.3 Provide a detailed geologic boring log, well construction diagram and completion information for all existing groundwater monitoring wells and/or a diagram of each proposed well. All wells shall be surveyed (top of casing, ground elevation and location), shall have unique nomenclature and be clearly identified on the Hydrogeologic Map as existing, proposed, abandoned, etc. **[1780.22(c)/1784.22(c)]**

NOTE: The Department has created a well construction diagram *for use. See* Operator Memorandum 2017-01.

When wells are no longer needed, the applicant shall request to properly plug and abandon the well. Upon receiving approval to drop the well from the Mine's groundwater monitoring program, the well shall be sealed and the Department's plugging affidavit shall be provided within sixty (60) of the date of approval.

NOTE: See Operator Memorandum 2015-02.

See Attachment 4.5.2, Monitoring Well Diagrams.

4.5.4 Provide the groundwater flow direction based upon the site-specific groundwater monitoring wells installed for this application. Hydraulic conductivity data shall be provided in its entirety, for each well. The field methodology of the aquifer testing shall be clearly explained (e.g., rising head vs. falling head slug testing; pump testing or constant-head testing). The results of the aquifer testing shall be included in this section and shall be discussed/explained, including any discrepant information. Groundwater flow direction may also be shown on the Potentiometric Map required in Part 4.4.3 above. **[1780.21(b)(1)(B)/1784.14(b)(1)(B)]**

Groundwater flows in a northerly and westerly direction towards Fordice Creek in the north and west sections of the permit area, and flow is in a south and southwesterly direction in the southern portion of the site. There is a high ridge that extends from northeast to southwest within the permit area and functions as a ground watershed breakline for flow direction.

The permittee is proposing to add wells GW-36 (unconsolidated) & GW-37 (spoil) to monitor the areas adjacent to the proposed slurry cell. See Attachment 4.5.2, Monitoring Well Diagrams. Slug tests will be performed on each well and will be submitted with the well completion diagrams.

A rising head slug test was performed on GW-29, 30, 31 and 32 and results are provided in Attachment 4.5.3. The calculated hydraulic conductivity at GW-29, 30, 31 and 32

ranged from 7.38 X 10^{-5} cm/sec to 6.09 X 10^{-4} with transmissivity values ranging from 1.26 ft^2/day to 17.25 ft^2/day.

The unconsolidated overburden layer within the permit area ranges from 17 to 22 feet in thickness, but the far west side and the northwest corner are thinner and range from 10 to 12 feet before encountering bedrock. The estimated hydraulic conductivity values for the silty clay soils within the permit area generally range from 1 X 10^{-6} to 1 X 10^{-7} cm/sec or 0.0028 to 0.00028 ft./day. However, calculated hydraulic conductivity values were observed to be higher in monitoring wells GW-29, 30, 31 and 32, possibly due to the thin and discontinuous till layer of silt and sand with gravel found directly above the sandstone bedrock. Based on these observations of consistently fine-grained silt and clay soils in addition to the discontinuous nature of the more permeable sand and till materials present, the aquifer potential of the unconsolidated material within the proposed permit area is poor and extremely limited. Refer to Hydrogeologic Map for groundwater flow direction.

4.8.1 Will the proposed coal mining and reclamation operations have adverse impacts to the hydrologic balance? **[1780.21(f)(3)(A)/1784.14(e)(3)(A)]**

☐ YES ☒ NO

Explain:

The proposed permit area within this application will be mined by conventional area surface mining methods using equipment specially designed for that purpose. Mining will result in removal and replacement of all material above and between the upper and lower Friendsville coal seams to be mined. After coal removal the slurry cell will be constructed within the backfill areas utilizing dozers equipped with GPS guidance systems. A clay liner will be constructed as discussed in the QA/QC plan (See Attachment 4.10). The liner as designed will prevent adverse impacts to the local hydrology. Monitoring wells will also be utilized to monitor the hydrology of the area. Vigo Coal Operating Co., LLC. has constructed numerous fine coal waste disposal areas within the Friendsville Mine with no impacts to the hydrology.

Considering that residential wells in close proximity to the proposed mining area are finished in the Mt. Carmel sandstone at depths in the 200 to 300 feet range, no adverse effects to these water supplies are expected from this operation. However, should private water supplies be adversely affected by the operation, that supply will be replaced with a source of similar or better quality as the existing source. Should the proposed mining and/or subsequent reclamation operations result in a substantial case of contamination, diminution, or interruption of a surface water or groundwater source within or directly contiguous to the proposed permit area, the applicant will develop or utilize an alternative water source as replacement for the disrupted source, including providing an interim source between water loss and replacement. Alternative sources of water include but are not limited to the following: 1) surface water impoundments, 2) local municipal or rural water supplies, 3) drilling replacement well(s) to formations exhibiting hydraulic characteristics suitable for water withdrawal and use, 4) treatment of water to attain usable quality, 5) haulage of water, etc. To date, and over the total past operation of the Friendsville Mine, no adverse effects to unconsolidated nor consolidated aquifers has been documented nor observed. Such adverse effects would

result in problems with water wells in the area, and no such effects have been documents.

Ongoing surface activities will disturb the land surface and will inevitably result in some changes to the surface water and ground water systems due to changes in drainage patterns and storm water runoff characteristics. However, the proposed surface facilities and mining operations have been located and designed to minimize any significant changes to the prevailing hydrologic balance within the permit and adjacent area. Therefore, the proposed activities are not expected to have significant adverse impacts on the hydrologic balance within the proposed permit area as well as the adjacent areas. Prior surface mining operations in the adjacent permit area has been observed to have had a limited and temporary impact in the hydrologic regime. Surface mining may result in a temporarily lower localized water table. Calculation of the post-mining water table is not possible without numeric modeling of the site. However, the water table within the mined and reclaimed area is predicted to stabilize after mining and restore to the pre-mining level. The water table is not expected to be significantly affected within any other areas. In addition to the above mentioned lowering of the water table in the mined and reclamation area, several changes in the surface and groundwater systems are expected to include the following: 1) Possible slight decrease in peak flow rates due to increased groundwater infiltration and an increase in developed surface water source; 2) Possible decrease in mean annual run off due to increased groundwater infiltration; 3) Possible increased base-flow into receiving streams because of increased groundwater infiltration.

Existing surface water runoff from the proposed permit area will be primarily directed to the sediment control ponds via a series of collector ditches. The effects on surface water quality will be negligible in part because all surface water discharges from significant disturbed areas are to be directed to a sedimentation basin(s) prior to off-site discharge, and because the facility will include design and operation criteria to prevent material damages. Surface activities will expose buried strata to the atmosphere and surface water, which will tend to increase the total dissolved solids in surface runoff. Any toxic forming materials excavated during the mining operation will be carefully handled and covered with soil material to limit their exposure. Coal processing wastes will be placed in the active pit area and will be covered with soil materials to prevent contact with surface runoff. Therefore, pH levels should remain unaffected. It is estimated that the maximum elevation of coal processing waste to be placed in the active pit area will be 430 msl.

The potential development of acidic or other adverse conditions will be monitored through the routine sampling and analyses of the discharge points from the mine surface facilities area in accordance with the NPDES permit. Under the NPDES provisions, exceedances of the discharge limits for all parameters analyzed must be reported immediately (within 24 hours by phone, followed up in written form). In exceedance reporting, the mine operator is required to explain the reason for the exceedance and further explain his remedial action plan to prevent future occurrences. Should a trend develop from repeated exceedances that indicates fluctuations in pH or acidity or other contaminants for a particular impoundment or sediment pond, the source of such increased acidity or other pollutants will be determined by an examination of the watershed to the respective pond. The treatment plan for this potential occurrence will be developed at that time, but will likely include one or a combination of the following actions:

1. Addition of alkalinity to potential acid-forming materials by application and incorporation of agricultural and ground limestone or hydrated lime at an appropriate rate to neutralize the source of the acidity. The preferred alternative is to maintain adequate cover over such material to prevent oxidation.
2. Addition of Sodium Hydroxide or hydrated lime to the receiving pond at appropriate rates sufficient to neutralize the acidity.
3. Modification of operations to place material serving as a source of acidity in a manner to avoid acid formation. This could include surface compaction to preclude oxidation, surface erosion control measures, or other means to prevent the formation of acidic runoff.
4. Watershed management to include vegetation establishment or mulch application.

During mining and reclamation activities, erosion and sediment control measures will be applied to disturbed areas to minimize contamination of surface runoff. During mining operations, sediment loading could improve over pre-mining conditions because of utilizing best management practices such as establishing and maintaining vegetative cover in areas that are currently cropland, construction of sedimentation basins, and decreasing peak flows and velocities by intercepting and retaining storm water runoff. Because of the increased mineralization discussed above, which tends to cause fine suspended particles to coalesce and settle, suspended solids may be lowered because of the proposed activities. Runoff from disturbed areas, except exempted areas, will pass through approved sediment ponds for treatment before release and will meet appropriate water quality criteria.

The cumulative impact area (CIA) is defined as the area, including the permit area, within which impacts resulting from the proposed operation may interact with the impacts of all anticipated mining on surface and groundwater systems. Since the proposed permit area will be encircled by a perimeter surface water collection and drainage ditch and earthen berm exclusion system, the SCIA will essentially be the limits of the proposed and the existing permit areas and a portion of the receiving streams. Descriptions of hydrogeologic and hydrologic conditions within the cumulative impact area, characterization of surface water and groundwater systems, material damage criteria, and discussions of designs to prevent material damages have been presented in other sections of this permit application. Hydrologic impact and interaction resulting from the mining operations proposed herein should be both temporary and limited in scope within the SCIA. The greatest impact should occur during active operations and should be temporary because of the finite life of mining. Impacts that may occur after mining and reclamation operations are completed should be limited in scope because of the proportionally large areal extent of the estimated SCIA relative to the size of the proposed disturbance area.

Additionally, and relative to the PHC on groundwater, mining operations are not expected to have a negative effect on water wells outside the mine permit area. In the unlikely event that the mining operation should cause a temporary dewatering of a residential water supply, a source suitable for the intended purpose will be provided until the existing water supply is recharged. Should the impact on a residential supply be determined to be permanent, that supply will be replaced with a source of similar or better quality as the existing source. Should the proposed mining and/or subsequent reclamation operations result in a substantial case of contamination, diminution, or interruption of a surface water or groundwater source within or directly contiguous to

the proposed permit area, the applicant will develop or utilize an alternative water source as replacement for the disrupted source, including providing an interim source between water loss and replacement. Alternative sources of water include but are not limited to the following: 1) surface water impoundments, 2) local municipal or rural water supplies, 3) drilling replacement well(s) to formations exhibiting hydraulic characteristics suitable for water withdrawal and use, 4) treatment of water to attain usable quality, 5) haulage of water, etc.

Measures to be taken to assure the protection of the quality of surface and groundwater systems from adverse effects of mining and the reclamation process include:

1. Installation of sediment control structures, including sediment basins, overland flow diversion ditches, temporary terracing, straw dikes or rip-rap filters, to control flow and routing of surface water.

2. Treatment, including neutralization where necessary, of effluent leaving the sediment basins and entering the normal surface water flow system. This effluent discharge will meet all the applicable performance standards.

3. Continued monitoring for surface water leaving the permit site and entering state waters.

4. Any toxic, acidic, or combustible materials encountered in the mining operation will be buried and covered with at least four (4) feet of non-toxic, non-combustible, earthen material. Overburden will not be stored in natural drainage ways. Overburden will be stored in structurally stable areas and handled as prescribed in the appropriate sections of this amendment.

5. Surface water accumulating in open pits is pumped to sediment basins, reducing the possibility of infiltration of contaminated water into groundwater. Sediment basins are designed to handle the peak flow of a 10-year, 24-hour storm event. Pit pumpage does not impact basin performance unless there is significant contribution of groundwater or surface runoff from outside the design watershed (most pit pumpage occurs after a storm event has peaked, and basin discharge rate has subsided). Pit pumpage will be limited to approximately 600 gallons per minute or slightly in excess of one cubic foot per second. The source of pit pumpage is typically surface water runoff. Groundwater discharge from any particular hydrogeologic unit has not been observed.

6. Boreholes (except holes drilled for blasting) will be plugged to prevent infiltration from surface water.

7. When possible, disturbed areas will be reclaimed to the approximate original drainage pattern in order to preserve the pre-mine hydrologic balance.

8. Coarse refuse from the preparation plant will be hauled to the open pit. Such material will be placed deep in the pit to isolate the material and its potential for formation of acidic conditions.

Topsoil replacement and revegetation plans are addressed in other appropriate sections of this permit. Following backfilling, grading, subsoil and topsoil replacement and revegetation, surface infiltration rates will be restored to conditions that approximate

those depicted in the reclamation plan section of this permit application. Timely reclamation, as described in the appropriate sections of this permit, is the most effective means to restore surface and groundwater conditions in impacted areas and protect said resources in adjacent areas. Deeper infiltration and increased groundwater storage may occur after completion of the mining and reclamation operations. Even though deeper infiltration and increased groundwater storage may occur, measurable impact to bedrock units below the lowest coal seam to be mined is unlikely. Soil infiltration rates should be improved in areas where fragipans (altered sub-surface soil layers) existed prior to mining. Following replacement, the soil horizons may be de-compacted by use of chisel plow or other suitable equipment.

Considering the above, the PHC to the groundwater supply in terms of quantity is estimated to be increased in the shallow zones above bedrock; no change in terms of quantity is expected in the lower, bedrock supplies. Regarding groundwater quality, some increase in TDS may be experienced in the shallow groundwater in the immediate area of the mining disturbance, but this should reduce due to dilution effects at distances away from the immediate mining area. Also, good mining practices referenced herein such as the designed placement of refuse and potentially acid-producing overburden deep within the spoils will serve to diminish the increases in TDS levels by the prevention of oxidation and acid formation from such materials. Compliance with IEPA Title 35 Section 620 relative to groundwater quality at the permit boundaries will be accomplished by the various practices described above.

The NPDES permit for the mine includes a Construction Authorization for monitoring wells that establishes a procedure for calculation of variance and standard deviation from the individual well background data for each parameter analyzed to check for statistically significant changes in groundwater quality from that established during the background period. During the operations and reclamation phase for the mine, each well is monitored quarterly. The procedure established by the NPDES permit requirement will identify possible changes of significance in groundwater quality near the mine permit lines.

Should groundwater monitoring during or after mining indicate a trend toward non-compliance with applicable regulations, involved agencies will be contacted for consultation in the development of a remedial action plan. Steps taken past the consultation process will be dependent on the nature and extent of the anticipated non-compliance issue, but assistance from the agencies and other professionals will be sought and complied with.

With regard to active and abandoned oil and gas wells in the proposed permit area, where the Applicant has the rights to mine, such wells will be properly sealed below the coal seam and will be mined through. Where the rights to mine such wells is not secured, the Applicant will remain an appropriate buffer distance from the wells with the mining operation. In no case will the mining operation be conducted in a manner such that groundwater contamination could occur due to the presence of these wells.

Abandonment of wells, including oil, gas and water will be done in accordance with applicable regulations for such work with appropriate affidavits filed. Sealing will be done from the bottom of the wells upward with bentonite slurry or cement grout mix.

4.8.2 Are acid forming or toxic forming materials (AFM) present that could result in contamination of surface and/or groundwater supplies? This shall include the handling and placement of AFM in the overburden during mining and reclamation ~~of~~ for surface mining and during construction of all shaft and slopes for underground mining. **[1780.21(f)(3)(B)/1784.14(e)(3)(B)]**

☐ YES ☒ NO

Explain:

See Attachment 4.3.3, Overburden Analysis within the original permit for boreholes FV-17-51 and FV-17-52. While certain strata within the overburden profile do exhibit acidity, the overall weighted balance indicates a major excess of alkaline material that will serve to neutralize any potential for acid production from overburden deposition. Final coal seam(s) will be covered in accordance with applicable regulations to prevent possible acid production.

4.8.3 Will the proposed surface coal mining and reclamation operations result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit, shadow or adjacent areas which is used for legitimate purposes? **[1780.21(f)(3)(C)/1784.14(e)(3)(D)]**

☐ YES ☒ NO

Explain:

Residential wells in close proximity to the proposed mining area are finished in the Mt. Carmel sandstone at depths ranging from 200 to 300 feet below the surface. Therefore, no adverse effects to groundwater sources of water are expected from this operation. During mining and reclamation activities, erosion and sediment control measures will be applied to disturbed areas to minimize contamination of surface runoff. Runoff from disturbed areas, except exempted areas, will pass through approved sediment control ponds for treatment before release and will meet appropriate water quality criteria. Further, the volume of surface water runoff from the proposed permit area will remain unchanged from the volume pre-mining.

4.10 Liners. Construction details and specifications, as well as a Quality Assurance/Quality Control (QA/QC) Plan for the proposed compacted clay liners shall be provided, as an attachment to this application, if a compacted clay liner is proposed for this operation. The QA/QC Plan should include, at a minimum:

- The loose soil thickness of each lift
- The methodology for replacing soft areas encountered during construction
- Frequency of permeability testing, and
- Means of protecting the constructed liner from damage.
- The location of all compacted clay liners throughout the proposed permit area.

If a geosynthetic liner is proposed in lieu of a compacted clay liner, provide an appropriate, relevant QA/QC Plan to ensure proper installation and maintenance of the geosynthetic liner is achieved. **[1816.41/1817.41]**

See Attachment 4.10 and Operations Map – Map 6.

TABLE 4.5.1
Groundwater Monitoring Parameter List

NAME	ABBREVATION
Aluminum	Al
Antimony	Sb
Arsenic	As
Barium	Ba
Beryllium	Be
Boron	B
Cadmium	Cd
Chloride	Cl
Chromium	Cr
Cobalt	Co
Copper	Cu
Cyanide	Cn
Fluoride	F
Iron	Fe
Iron (Dissolved)	Fe (Diss)
Lead	Pb
Manganese	Mn
Manganese (Dissolved)	Mn (Diss)
Mercury	Hg
Molybdenum	Mo
Nickel	Ni
Nitrate as N	N
Phenols	
Selenium	Se
Silver	Ag
Sulfate	SO4
Thallium	Tl
Total Dissolved Solids	TDS
Vanadium	V
Zinc	Zn
pH	
Acidity	
Alkalinity	
Conductivity	
Hardness	
Water Elevation	

Table modified 3/14/2018

TABLE 4.5.2

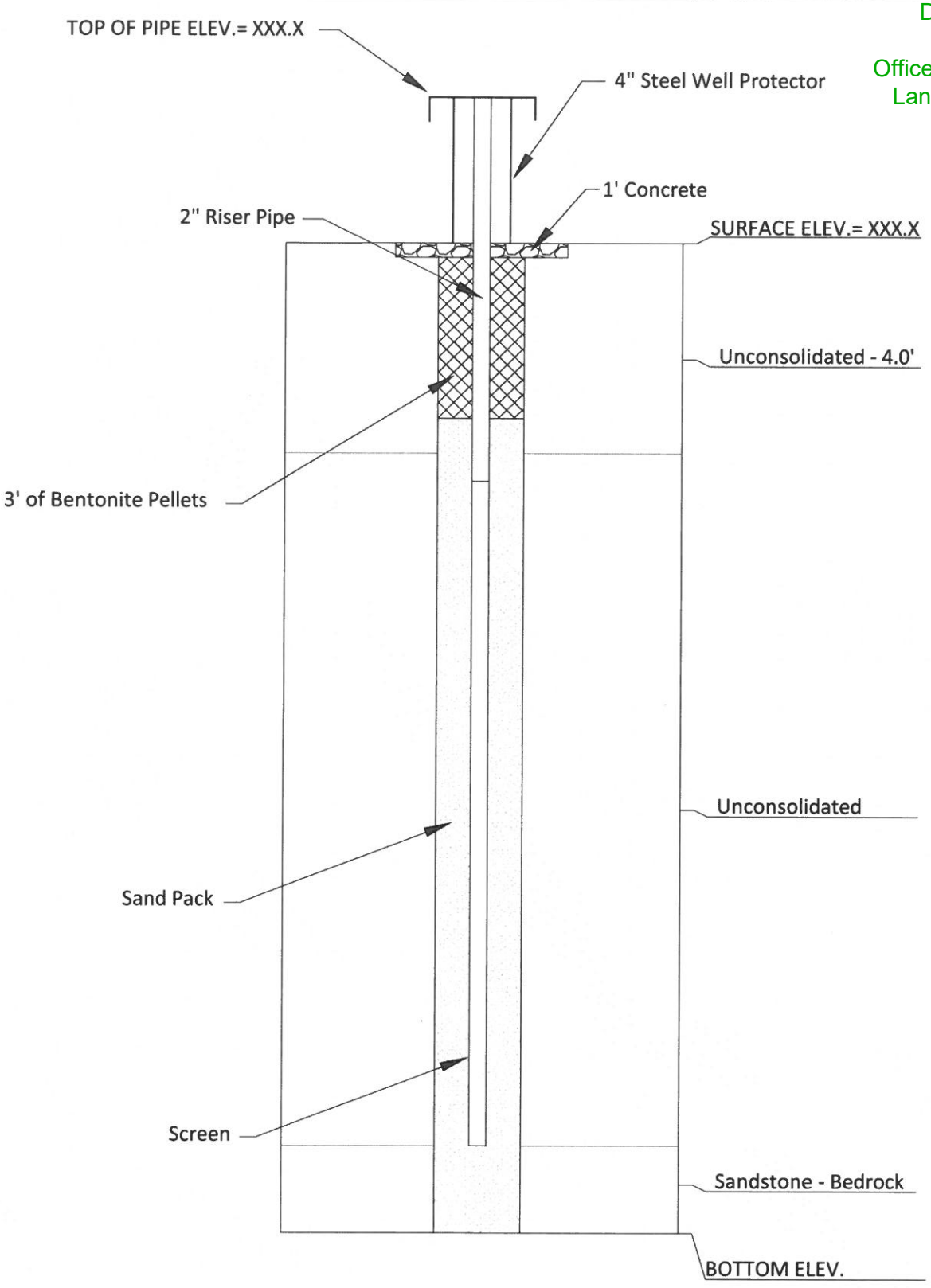
Groundwater Monitoring Well List

(For Existing and Proposed Wells for the Entire Facility)

WELL ID	CURRENT WELL STATUS	WELL INSTALL DATE	WELL PLUG DATE	TOTAL WELL DEPTH (Ft)	SCREEN INTERVAL (Ft. BGS)	GROUND ELEVATION (Ft. MSL)	TOP OF CASING ELEVATION (Ft. MSL)	SCREENED MATERIALS	MONITORING PARAMETERS	MONITORING FREQUENCY	WELL PURPOSE	LOCATION (LAT/LONG) IN DECIMAL DEGREES	PART OF GMZ?	PART OF LRD GW PROGRAM?
GW36	PR										Monitoring		No	Yes
GW37	PR										Monitoring		No	Yes

WELL STATUS: A = Active; P = Plugged; D = Destroyed/Mined-Thru; I = Inactive (not currently being monitored); PR = Proposed (not yet installed)
MONITORING PARAMETERS: SMCRA = pH, TDS, Hardness, Conductivity, acidity, alkalinity, sulfate, iron (total and dissolved), manganese (total and dissolved), chloride & water elevation (reported as true elevation
MONITORING PARAMETERS: 620'S = SMCRA + alumium, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, cyanide, fluoride, lead, mercury, molybdenum, nickel, nitrate as N,
MONITORING FREQUENCY: B = Bi-monthly; M = Monthly; Q = Quarterly; A = Annually; SA = Semi-Annually

Table Created 3/14/2018



Vigo Coal Operating Co., LLC. Friendsville Mine
Groundwater Well GW-36 Attachment 4.5.2
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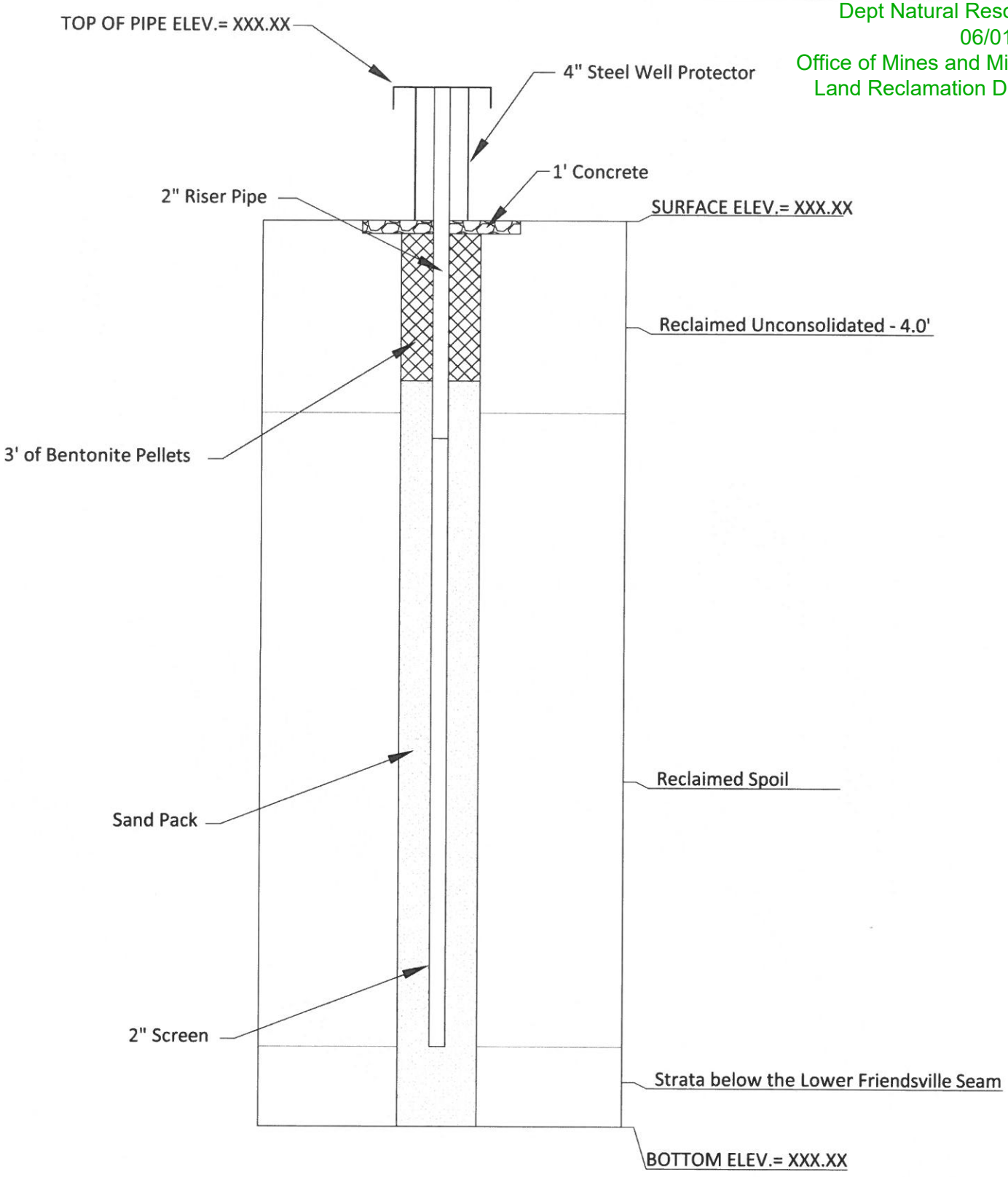

Vigo Coal Operating Co., LLC. Friendsville MIne
Groundwater Well GW-37 Attachment 4.5.2
LAT: 38.4443 LON: 87.8489

CONSTRUCTION QUALITY ASSURANCE
QUALITY CONTROL PLAN

Slurry Pond No. 4
Compacted Clay Liner System
Vigo Coal Operating Co, LLC
Permit No. 458

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Table of Contents

1.0 - INTRODUCTION

This plan describes the construction Quality Assurance/Quality Control (QA/QC) Program for slurry pond liner construction at the Friendsville Mine. The mine is approximately two miles west of the City of Mt. Carmel north of Illinois Route 15. The mine is operated by Vigo Coal Operating Co., LLC and is covered by NPDES Permit No. IL0073636 and IDNR/OMM Permit No. 458. This is Slurry Pond No. 4 for this facility. The slurry pond has a footprint of approximately 15 acres situated near the northwest corner of the mined area.

The overall goals of this program are to verify that the materials used meet the required regulations and specifications, to ensure proper construction techniques and procedures, and to identify and define problems that may occur during construction and correct those problems prior to the completion of construction. At the completion of each major phase of construction, this Program requires acceptance reports to be submitted to the Agency indicating that the facility has been constructed in accordance with design standards and specifications. It is the responsibility of the Construction Quality Assurance/Quality Control Officer to prepare these reports.

To provide a basis for this plan quality control and quality assurance are defined below:

Quality Control (QC) (ASTM D3740): A planned system of activities, or the use of such a system, whose purpose is to provide a level of quality that meets the needs of users. The objective of quality control is to provide stable quality that is safe, adequate, dependable and economic. The overall system involves integrating the quality factors of several related steps including: the proper specifications of what is wanted, and the production methods used to meet these specifications.

Quality Assurance (QA) (ASTM D3740): A planned system of activities whose purpose is to provide assurance that the overall quality control program is in fact being effectively implemented. This system involves a continuing evaluation of the adequacy and effectiveness of the overall quality control program with a view to have corrective measures initiated where necessary. For a specific material, product, service, etc., this involves verifications, audits and the evaluation of the quality factors that affect the specification, production, inspection and use of the product, service, system or environment.

This plan is written to achieve the overall goals, allow the preparation of certification reports and provide QA/QC as defined. This plan is organized into the following sections:

- Responsibility and authority
- QA/QC Personnel Qualifications
- Project Meetings
- Inspection Activities
- Sampling Requirements
- Documentation

Further, the plan is written in a document control fashion so that future modifications to this plan can be made and easily incorporated.

All parties involved in the project will receive a copy of this plan. They will also be given any other QA/QC documents specially prepared for or relevant to the project.

This plan is intended to supplement, but not supersede, the project plans and specifications. Where a conflict arises, the approved plans and specifications will govern.

2.0 - RESPONSIBILITY AND AUTHORITY

The principal organizations involved in the permitting, design and construction of the slurry pond are IDNR/OMM, IEPA, Vigo Coal Operating Co., LLC., Hampton, Lenzini and Renwick, Inc., and QA/QC personnel that are to be determined. Periodic project meetings will be held to provide for communication and coordination among the parties involved.

2.1 - ILLINOIS DEPARTMENT OF NATURAL RESOURCES / OFFICE OF MINES AND MINERALS

The Illinois Department of Natural Resources / Office of Mines and Minerals (IDNR/OMM) is authorized by law and regulations to issue the developmental permit of which this program is a part. It is the responsibility of the IDNR/OMM to review the developmental permit application for compliance with applicable laws, regulations and policies. Based on this review, IDNR/OMM may grant the permit and include special conditions or deny the permit application and site the regulations, which are the basis for the denial. If subsequent revisions to the permit application are required, IDNR/OMM will also review and act on those revisions.

During or after slurry pond construction, the IDNR/OMM may also review QA/QC records, certifications and other reports that may be required by special permit conditions to ensure, with a reasonable degree of certainty, that the facility was constructed to meet all approved plans and specifications.

2.2 - ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

The Illinois Environmental Protection Agency (IEPA) is authorized by law and regulations to issue the developmental permit of which this program is a part. It is the responsibility of the IEPA to review the developmental permit application for compliance with applicable laws, regulations and policies. Based on this review, IEPA may grant the permit and include special conditions or deny the permit application and site the regulations, which are the basis for the denial. If subsequent revisions to the permit application are required, IEPA will also review and act on those revisions.

During or after slurry pond construction, the IEPA may also review QA/QC records, certifications and other reports that may be required by special permit conditions to ensure, with a reasonable degree of certainty, that the facility was constructed to meet all approved plans and

specifications.

2.3 - OWNER

The facility is currently owned by Vigo Coal Operating Co., LLC. For purposes of this QA/QC plan, Vigo Coal Operating Co., LLC. will be referred to as the "owner".

2.4 - OPERATOR

The facility is currently operated by Vigo Coal Operating Co., LLC. For the purposes of this QA/QC plan Vigo Coal Operating Co., LLC. will be known as the "operator". Vigo Coal Operating Co., LLC. is responsible for obtaining the necessary permits for development and operation of the slurry pond. Included in this responsibility is complying with the requirements of the IDNR/OMM and the IEPA in order to obtain the developmental permit and assuring these agencies by submission of QA/QC records that the slurry pond was constructed, with a reasonable degree of certainty, to meet or exceed all approved plans and specifications. Vigo Coal Operating Co., LLC. has the authority to select and dismiss parties charged with design, construction quality assurance and construction activities. Further, Vigo Coal Operating Co., LLC. has the authority to accept or reject design plans, criteria and specifications, QA/QC plans, progress review and recommendations of the QA/QC Officer, and the materials and workmanship of construction employees.

2.5 – HAMPTON, LENZINI AND RENWICK, INC.

Hampton, Lenzini and Renwick, Inc. is the design engineering firm (design engineer) and is responsible for design plans, specifications and all supporting documents for the slurry pond liner system. The design engineer is responsible for devising a design that fulfills the needs of the "owner" and/or "operator" in terms of function and that meets the requirements for submittal to the IDNR/OMM and IEPA. Design elements may have to be modified if unexpected conditions are encountered that could adversely affect facility performance. Construction quality assurance provides a means for these unexpected changes or conditions to be detected, documented, and communicated to the owner and design engineer and corrected during construction. Hampton, Lenzini and Renwick, Inc. was also responsible for preparing this QA/QC plan.

2.6 - CONSTRUCTION QUALITY ASSURANCE PERSONNEL (QA/QC)

The overall responsibility of the QA/QC personnel will be to fulfill the activities specified in this QA/QC plan. The QA/QC personnel will include a QA/QC Officer and the necessary supporting inspection staff. Generally, the responsibilities of the QA/QC Officer will include supervising and monitoring compliance with all requirements of this plan. Specific responsibilities of the QA/QC Officer will include:

- Reviewing design drawings and specifications for clarity and completeness.
- Serving as the design engineer's liaison with the construction contractor in interpreting and clarifying project drawings and specifications.
- Educating/informing construction and inspection personnel on job requirements.
- Scheduling site inspections.
- Directing and supporting the inspection staff in performing observations and tests by:
- Confirming that testing equipment, personnel, and procedures do not change over time or concurring that any changes do not result in deterioration of the inspection process.
- Confirming that test data is accurately recorded and maintained (this may involve selecting reported results and back tracking them to the original handwritten log and laboratory data sheets).
- Verifying that raw data is properly summarized and interpreted.
- Providing to the Owner reports on the inspection results including:
- Review and interpretation of observation records and test results.
- Identification of work that the QA/QC Officer believes should be accepted, rejected or uncovered for observation, or may require special testing, inspection or approval.
- Reports that reject defective work and specify corrective measures.
- Verifying that construction contractors are following their respective construction quality control plans.
- For the supporting inspection staff, specific responsibilities include:
- Observing all construction activities.
- Verifying that equipment used in testing meets the test requirements and that tests are conducted by qualified personnel according to the standardized procedures defined by the QA/QC plan.
- Monitoring all tests conducted by the contractors' personnel as may be required by the contract, design specifications and/or this plan.
- Performing independent on-site inspections of the work in progress to assess compliance by the contractor with the approved plans and specifications.

- Performing independent on-site tests in accordance with this QA/QC plan.
- Reporting to contractors the results of all observations and tests as the work progresses and interacting with the contractor to provide assistance in modifying the materials and work to comply with the specified design.
- Reporting to the QA/QC Officer and providing proper documentation of all inspections including work that is not of acceptable quality or fails to meet the specific design.
- Performing the required measurements and surveying to verify proper construction grades, depths, elevations, etc.

The QA/QC Officer shall supervise and be ultimately responsible for all inspections, field testing, and other activities required or to be implemented as part of this plan. In the event the QA/QC Officer is unable to be present to provide supervision and assume responsibility for all inspection activities, the QA/QC Officer shall designate a person who shall exercise professional judgment in carrying out the duties of a QA/QC Officer as the designated QA/QC Officer in-absentia.

2.7 - SOILS LABORATORY

A soil laboratory will be selected to perform the soil testing required by the QA/QC plan. The soil laboratory will be experienced in geotechnical soil testing. The soils laboratory is responsible for providing high quality soil test results within the timeframe required by the QA/QC Officer. Further, the laboratory is responsible for implementing its own QA program.

3.0 - PROJECT MEETINGS

Periodic meetings will be held during the life of the project to enhance coordination among the various parties involved. Meetings will include a resolution meeting, a preconstruction meeting, routine progress meeting and as needed problem or work deficiency meetings.

3.1 - PRECONSTRUCTION MEETING

A preconstruction meeting will be held at the site. Representatives of Vigo Coal Operating Co., LLC. and Hampton, Lenzini and Renwick, Inc. will be present. The purpose of the preconstruction meeting is to:

- Review the responsibilities of each organization.
- Review lines of authority and communication of each organization.
- Discuss the established protocol for observations and tests.
- Discuss the established protocol for handling construction deficiencies, repairs and re-testing.
- Review methods for distributing and storing documents and reports.
- Review work area security and safety protocol.
- Discuss any appropriate modifications of the QA/QC plan to ensure that site-specific and contractor specific considerations are addressed.
- Discuss procedures for the protection of materials and for the prevention of damage from inclement weather or other adverse events.
- Conduct a site walk-around to verify that the approved plans and specifications are understood and to review material and equipment storage locations.

3.2 - PROGRESS MEETINGS

Progress meetings will be held as needed to ensure the project is progressing in satisfactory manner. Appropriate personnel will attend these meetings. The purpose of progress meetings are:

- Review all the previous activities and accomplishments.
- Review the work location and activities for the upcoming work.
- Discuss any potential construction problems.

4.0 - INSPECTION ACTIVITIES

This section describes the inspection activities (observations and tests) to be performed during slurry pond liner construction that are necessary to ensure, with a reasonable degree of certainty, that the completed slurry pond meets the approved plans and specifications. There is an initial subsection that addresses general preconstruction activities. The subsequent subsections address each slurry pond component separately and are further subdivided into subsections on preconstruction, construction and postconstruction inspection activities unique to each component. Inspection activities are summarized in Table I.

4.1 - GENERAL PRECONSTRUCTION ACTIVITIES

The QA/QC Officer will review the design drawings and specifications for the slurry pond liner. If the QA/QC Officer deems the design unclear, it should be returned to the design engineer for clarification.

Before construction, the QA/QC Officer, with the assistance of the inspection staff, should assess the capabilities of the construction contractor's personnel to determine the type and amount of instruction and training needed during all phases of construction. This assessment will include an evaluation of the contractor's prior performance on construction projects, experience in constructing liner systems and experience with the specific materials and equipment to be used in constructing the liner system.

4.2 - COMPACTED EARTH LINER

A minimum four (4) foot thick compacted clay liner with a permeability of 1×10^{-7} cm/sec, or less, is required for Slurry Pond No. 4. The purpose of the compacted earth liner is to minimize the rate of migration of any leakage from the slurry pond into the groundwater system. The following subsections describe the inspection activities that are necessary to ensure, with a reasonable degree of certainty, that a soil liner is constructed to meet or exceed the specified design.

4.2.1 - Preconstruction

Preconstruction QA/QC activities include inspection of liner.

4.2.2 - Materials Inspection

The QA/QC Officer will inspect all liner material to ensure they are uniform and are as specified. Material inspection begins as a preconstruction activity and continues through the liner construction. The material inspection will be performed at the area where it is excavated or as it is placed in stockpiles. Unsuitable material will be rejected. It may be necessary for the QA/QC Officer or his designee to guide excavating equipment to avoid or segregate substandard soil material as it is excavated. The inspector will observe liner material segregation carefully and continuously to ensure that only suitable material is retained for liner construction.

Initial inspection of the soil will be visual, considering grain-size distribution, moisture content and organic content. Samples of the liner materials will also be tested to ensure that material properties are within the range stated in the specifications. Sampling and testing requirements are identified on Table 1.

4.2.3 - Construction

A minimum four (4) foot thick compacted clay liner with a permeability of 1×10^{-7} cm/sec, or less, is required for Slurry Pond No. 4. This liner shall be constructed from cohesive soils selected from stockpiles or borrow areas under the direction of the QA/QC Officer.

The compacted clay liner shall not be placed while excessive rain is falling as determined by the QA/QC Officer. Prior to resuming operations after rainstorms, all muddy materials shall be bladed off the surface to a depth necessary to expose firm compacted material and then scarified and recompacted. In addition, the compacted clay liner shall be placed when both the air and soil temperature are above freezing.

The permeability of the compacted clay liner must be less than or equal to 1×10^{-7} cm/s based on laboratory and field testing. The QA/QC Officer shall perform testing required to document performance of the compacted clay liner. All areas tested (destructive sample locations) shall be backfilled with a soil bentonite mixture to result in an acceptable seal.

The liner shall be placed in compacted lifts thickness not to exceed 12 inches in depth and will be compacted to achieve the required density. The clay liner shall be compacted to 95% Standard Proctor density. The moisture content of the liner during compaction shall be sufficient to

achieve the specified compaction and permeability. The moisture should be at or above optimum but no more than 3% above optimum. The clay used for the liner shall be material which can achieve the specified permeability at the specified compaction and moisture content. Each lift shall be blended into the underlying lift. Any lift rolled with a smooth wheel roller to seal the surface from rain shall be scarified to a depth of at least 2 inches before the next lift of soil is placed and compacted.

Testing of the individual lifts shall be performed based on the statistical sampling grid. The grid spacing is 100 feet by 100 feet and are numbered. The moisture/density results from nuclear gauge testing shall be evaluated by the QA/QC Officer to determine if the constructed lift is within the permeability window established from the test liner construction. Random destructive testing will be performed to confirm the permeability specification is being achieved.

When the liner is constructed on slopes steeper than 4:1 along the plane of the slope, the Contractor shall demonstrate the compactive effort of the equipment being used, when used on the slope. The equipment shall provide sufficient compactive effort on the slope to achieve the specification.

The overall thickness of the compacted earth liner must be at least four feet. Prior to acceptance and sealing of the final grade, the final compacted lift of the liner shall be surveyed with the same frequency and accuracy as the subgrade survey. The survey measurements shall be taken in the same locations as the subgrade survey and the elevations of the two compared to demonstrate the completed liner thickness of at least four feet. Any areas with less than four feet of liner thickness shall be properly filled and resurveyed. This as-built survey coordinate information shall be included in tabular format in the QA/QC Acceptance Report.

After the final lift of the liner has been compacted and brought to final design grades and elevations, the entire lined area shall be sealed for protection. Extreme care shall be exercised during the surface sealing to avoid quick or sharp turns or other movements which may tend to shear the upper layers of the liner. After the liner has been sealed no heavy traffic shall be allowed to operate directly on the sealed areas.

Construction of the compacted earth liner will strictly adhere to the approved materials. Construction quality assurance will be provided by both continuous observations by an inspector and frequent use of tests. Materials inspection is the first step in providing QA/QC and is an

ongoing activity. Test methods, frequency and acceptance criteria are specified in Table I. Inspection activities are as follows.

- Observations before, during and after placement to ensure the following:
    - Removal of roots, rocks, rubbish or off-spec soil from liner material.
    - Identification in changes in soil characteristics necessitating a change in construction specifications.
    - Adequate clod size reduction of liner material.
    - Test holes are filled in accordance with methods and procedures identified from the test liner.
    - Uniformity of coverage by compaction equipment, especially at fill edges, in equipment turnaround areas and at the tops and bottoms of slopes.
    - Weather conditions are noted and construction procedures are adjusted for conditions or construction is halted.
    - Traffic controls and patterns are followed which will prevent accidental damage of installed portion of the soil liner by equipment traffic.
    - Timely placement of protective covers to prevent desiccation or erosion of liner material during interruptions in construction, between installation of lifts or after completion of liner.
    - Use of the methods to tie liner lifts together as determined from the test liner.
    - Surveying and measurements to ensure adequate spreading of liner material to obtain complete coverage and the specified loose lift thickness.
    - Test to ensure the following:
        - Achievement of the specified soil density/water content/compactive effort throughout each completed lift.
        - Achievement of specified liner strength to maintain sidewalls and to supply a stable base for overlying materials.

Inspection, sampling and testing activity will help ensure, with a reasonable degree of certainty, that the slurry pond liner meets the approved plans and specifications by preventing, detecting and correcting the following:

- Regions of higher than specified liner permeability caused by use of unspecified materials, inadequate moisture control, insufficient compaction effort, failure to fill test holes

properly or construction during periods of freezing or other unacceptable weather.

- Less than specified liner thickness or coverage from failure to observe, monitor and control soil placement and compaction operations.
- Partings between liner lifts from failure to scarify and control moisture in adjacent lifts.
- Leaks around designed liner penetrations resulting from improper sealing and compaction.
- Erosion or desiccation of the liner from failure to provide protective cover when construction is interrupted or after liner completion.

All perforations of the compacted earth liner will be backfilled with a dry clay-bentonite mixture. The mixture will be compacted in place with a tamping rod, hand tamper, and/or proof roller, depending on the size of the perforation. This shall include, but not be limited to, the following:

1. Undisturbed sampling locations
2. Nuclear density test probe locations
3. Shelby tube locations

4.2.4 - Postconstruction

The soil liner will be proof rolled and inspected for cracks, holes, defects or any other features that may increase its field permeability. All defective areas will be removed. If the underlying foundation is defective (soft or wet), then this material also should be removed and the resultant volume should be replaced.

Excavated areas of the earth liner should be repaired by the method verified during test liner construction. Special attention will be paid to the final inspections of the sidewall and bottom slopes, liner coverage, liner thickness and the coverage and integrity of the cover placed over the liner. The completed liner should be protected from both desiccation, erosion and freezing immediately following completion of the uppermost lift.

Slurry Pond No. 4 will be placed in service as soon as possible after completion of the liner system. During the filling of the pond the Operator must take care to make sure erosion does not occur to the liner system utilizing splash mats or other provisions. The side slopes of the liner system shall be watered as needed to prevent desiccation during pond filling. Once the pond reaches its

normal operating depth the liner system will be completely submerged. Some clay liner may extend beyond the normal operating depth of the pond. Since this liner is not containing any materials it will not be necessary to care for this portion of the liner system.

Upon completion of construction of the liner system, a QA/QC Acceptance Report will be prepared for inclusion with the final documentation of the project. This Report will contain the following information for the compacted clay liner:

- Full scale liner construction protocol
- Full scale liner moisture/density test results
- Full scale liner laboratory permeability test results
- As-built liner thickness report
- Survey and test location maps
- As-built contour maps with a one-foot contour interval

5.0 - STATISTICAL SAMPLING REQUIREMENTS

Sampling requirements are generally spelled out in the subsection dealing with a particular facility component. For many of those components the sampling frequency is based on judgement; that is general industry experience gained from other similar projects. Because of the importance of the compacted earth liner, and the impracticability of testing 100% of the compacted earth, statistical sampling methods are necessary and required by IEPA regulations. This section addresses statistical sampling requirements for the compacted earth liner. Sampling requirements for other than statistical methods are listed in Table I.

5.1 - SAMPLING FREQUENCY

The sampling size needed to estimate the average value of the following parameters: 1) moisture/density relationship (Standard Proctor), 2) density of soil and soil aggregate in place by nuclear methods (shallow depth) and 3) water content of soil and rock in place by nuclear methods (shallow depth) (which relates to the hydraulic conductivity) is:

$$n = (ts/E)^2$$

where: n = number of samples
t = probability factor
s = the known or estimated true value of the standard deviation for moisture density
E = the maximum allowable error between the estimate to be made from the sample and the result of measuring all of the material

The number of samples n, is the variable that must be calculated. A probability factor, t, of 1.64 or a 1.96 will be used. A, t, value of 1.64 corresponds to a 95 percent level of confidence using a one-sided test and value of 1.96 corresponds to a 95 percent confidence level using a two-sided test.

The standard deviations will be calculated from the results obtained during testing of the test liner. The maximum allowable error, E, will be 5 percent.

From the above equation the number of samples will be calculated that are required to have a

95 percent level of confidence that the value of the particular parameter meets the specified criteria for that parameter (Standard Proctor, nuclear moisture and density test) for that activity. As test results are generated during the construction of the full-scale liner, acceptable results will be included in the calculation of the standard deviation. The standard deviation will be recalculated each day until at least thirty values are included and there is no significant change in the standard deviation (and subsequently the calculated number of samples needed).

5.2 - STATISTICAL SAMPLING

Based on the ability of the Contractor to complete a given area of compacted earth per day, a square grid of an appropriate size will be laid out over the area. The grid size, to the extent possible will remain constant from day to day. The grid will be of a size that provides for at least ten times the largest number of samples needed to characterize the above parameters. The grids will be sequentially numbered beginning from a consistent origin location (e.g. the northwest grid will be number 1, grid numbers will increase left to right). Samples will be collected from grids selected by using a random number table.

5.3 - CORRECTIVE MEASURES

In the event of nonacceptance with the acceptance criteria of a test value from a statistically selected sample, the test shall be rerun.

If the second test passes, an error in the first test can be assumed and the work may be accepted.

If the second test fails, additional tests will be performed in the adjacent grids until the area with nonacceptable test values is determined. The Contractor must then rework the area that failed to meet the acceptance criteria. Each grid that was reworked must be retested to see if the acceptance criteria are met. If the acceptance criteria are still not met in any part of the unacceptable area, the Contractor must remove the material from that area and replace it. The newly placed material must then be tested, including verifying adequate bonding with the adjacent acceptable material.

6.0 DOCUMENTATION

Documentation of QA/QC activities provides evidence that the appropriate inspection and testing activities have occurred and all observations and test results fall within the acceptance criteria or appropriate corrective actions have been performed. Documentation is in the form of design engineer's acceptance of completed components, photographs, certifications to IEPA and final documentation.

6.1 - Inspection Data Sheets

All observations and field or laboratory tests will be recorded on an inspection data sheet. Data required for most of the standardized test methods are included in the method references.

Because of their nonspecific nature no standard format can be given for data sheets to record observations. Recorded observations may take the form of notes, charts, sketches, photographs or any combination of these.

At a minimum inspection data sheets should include the following information:

- Unique identifying sheet number for cross-referencing and document control.
- Description or title of inspection activity.
- Location of the inspection activity or location from which the sample was obtained.
- Type of inspection activity; test procedure used if appropriate.
- Recorded observations or test data, with all necessary calculations.
- Results of the inspection activity and comparison with specifications.
- Personnel involved in inspection activity.

6.2 - Problem Identification and Corrective Measures Report

A problem is defined as a material or workmanship that does not meet the design criteria, plans or specifications. Problem Identification and Corrective Measures Reports will be cross-referenced to specific inspection data sheets where the problem was identified and will be documented as needed. At a minimum the reports will include the following:

- Unique identifying sheet number for cross-referencing and document control.
- Detailed description of the problem.
- Location of the problem.
- Probable cause of the problem.
- How and when the problem was located (reference to inspection data sheets).
- Estimation of how long problem has existed.
- Suggested corrective measures.
- Documentation of actual correction (reference to inspection data sheets).
- Final resolution of problem.
- Suggested methods to prevent similar problems.
- Signature of the appropriate inspection staff member and concurrence by the QA/QC Officer.

In the event of a recurring problem, the information will be reviewed and changes to prevent recurrences will be recommended. The appropriate inspection staff member will document this type of review in a brief report containing the supporting problem identification, corrective measure reports and recommendations to prevent recurrence.

6.3 - PHOTOGRAPHS

Photographs provide a pictorial record of work progress, problems and corrective measures. All photographs will be mounted and attached to appropriate reports. The mounting sheet will include, at a minimum, the following information:

- A unique identifying number or mounting sheets and individual photographs for cross-referencing and document control.
- The dates, time, and weather conditions when photograph was taken; and direction and location photographs were taken.
- The size, scale and orientation of the subject matter photographed.
- Location and description of work.
- The purpose of the photograph.

6.4 - ACCEPTANCE REPORT

As-built drawings, inspection summary reports, inspection data sheets, and problem identification and corrective measure reports will be evaluated and analyzed for internal consistency and for consistency with similar work. Once assembled and summarized the above information will be used to create an Acceptance Report. This report will be included in project records and submitted to IEPA at the conclusion of construction.

TABLE 1

GUIDE TO INPSECTION METHODS, SAMPLING AND TESTING REQUIREMENTS AND ACCEPTANCE CRITERIA

FACILITY COMPONENT	FACTORS TO BE INSPECTED	INSPECTION METHOD	TEST METHOD REFERENCE	SAMPLING FREQUENCY	LOCATION	ACCEPTANCE CRITERIA
1. Compacted Earth Liner						
Pre-construction	Soil type (properties)	Visual/Manual Procedure	D2488-93	1 per 5,000 yd^3 per soil type (min. 3)	TBD	CPR
		Particle-size analysis of soils	D422-63 (1990)	1 per 5,000 yd^3 per soil type (min. 3)	TBD	CPR
		Specific gravity of soils	D854-83	1 per 5,000 yd^3 per soil type (min. 3)	TBD	CPR
		Materials in soils finer than #200 sieve	D1140-92	1 per 5,000 yd^3 per soil type (min. 3)	TBD	CPR
		Classification of soils for engineering purposes	D2487-93	1 per 5,000 yd^3 per soil type (min. 3)	TBD	CPR
Pre-Construction	Soil type (properties)	Atterberg Limits	D4318-93	1 per 5,000 yd^3 per soil type (min. 3)	TBD	Plasticity Index PI > 10%
	Moisture content	Laboratory determination of moisture content	D2216-90	1 per 5,000 yd^3 per soil type (min. 3)	TBD	+3% of Optimum Moisture Content
	Moisture-density relationship	Standard Proctor	D698-91	1 per 10,000 yd^3 per soil type (min. 3)	TBD	Established for each soil type
Construction	Soil type (properties)	Particle-size analysis of granular soils	D422-63 (1990)	1 per 5,000 yd^3 per soil type (min. 3)	IJ	As reported
	Hydraulic conductivity	Permeability of granular soils	D5084-90	1 per 20,000 yd^3 in-place per soil type (min. 3)	TBD	< 1 x 10^{-7} cm/sec

TABLE 1

GUIDE TO INPSECTION METHODS, SAMPLING AND TESTING REQUIREMENTS AND ACCEPTANCE CRITERIA

FACILITY COMPONENT	FACTORS TO BE INSPECTED	INSPECTION METHOD	TEST METHOD REFERENCE	SAMPLING FREQUENCY	LOCATION	ACCEPTANCE CRITERIA
	Soil type (properties)	Materials in soils finer than #200 sieve	D1140-92	1 per 5,000 yd^3 per soil type (min. 3)	TBD	>50%
	Moisture-density relationship	Standard proctor	D698-91	1 per 10,000 yd^3 per soil type (min. 3)	TBD	Established for each soil type
	Density	Nuclear density	D2922-91	1 per lift per acre	TBD	95% of Standard Proctor Density
	Moisture content	Nuclear method	D3017-88	1 per lift per acre	TBD	±3% of Optimum Moisture Content
	Unsuitable soil	By observation	N/A	Continuous	N/A	ECQA
	Clod size reduction	By observation	N/A	Continuous	N/A	ECQA
	Equipment type	By observation	N/A	Continuous	N/A	ECQA
	Spreading and compaction procedures	By observation	N/A	Continuous	N/A	ECQA
	Weather	By observation	N/A	Daily	N/A	ECQA
	Coverage	By observation	N/A	Continuous	N/A	ECQA
	Filling test holes	By observation	N/A	100%	N/A	ECQA
	Traffic control	By observation	N/A	Continuous	N/A	ECQA
	In place lift protection	By observation	N/A	After completion of each lift	N/A	ECQA
	Lift thickness	By observation	N/A	1 per lift per acre	TBD	6" compacted
Post-Construction	Proof rolling	By observation	N/A	Continuous	Where liner is to be covered	ECQA

TABLE 1

GUIDE TO INPSECTION METHODS, SAMPLING AND TESTING REQUIREMENTS AND ACCEPTANCE CRITERIA

FACILITY COMPONENT	FACTORS TO BE INSPECTED	INSPECTION METHOD	TEST METHOD REFERENCE	SAMPLING FREQUENCY	LOCATION	ACCEPTANCE CRITERIA
	Integrity of liner	By observation	N/A	100%	Where liner is to be covered	ECQA

Key to Abbreviations

MARV – Minimum Average Roll Value
CPR – Consistent with Previous Results
ECQA – As Established in the Construction Quality Assurance Narrative
TBD – To Be Determined
N/A – Not Applicable

Note: This table is meant to supplement, not supersede the construction quality assurance plan or the plans and specifications and to be used as a guide for inspection method, sampling and testing requirements and acceptance criteria. All test method reference numbers are ASTM (American Society of Testing and Materials) test numbers.

PART 5: Drainage Control

5.1 Pre-mining Drainage Patterns Mapping. On the Existing Streams Location and Watershed Map, show the pre-mining drainage patterns of all areas to be affected by the mining and reclamation activities within the permit boundary and properties adjacent to the permit boundary. The map shall include, at minimum, adequate contour mapping, a delineation of the watershed boundaries both within and adjacent to the permit boundary, and shall depict the size of each watershed. **[1780.14/1784.23]**

5.2 General Drainage Control Description.

5.2.1 Will all surface drainage from the affected mining area be collected and treated prior to leaving the permit area? **[1816.46(b)(2)/1817.46(b)(2)]**

☒ YES ☐ NO

If NO, delineate the areas where an exemption is being requested on the Operations Map. Describe each location concerning the size of the disturbed area and the type of disturbances. Describe alternate sediment control measures to be utilized if proposed. Demonstrate that siltation structures and alternate sediment control measures (if not proposed) are not necessary for drainage from the disturbed areas to meet effluent limitations and water quality standards. **[1816.46(e)/1817.46(e)]**

Not Applicable

5.2.2 Will any surface drainage from unaffected areas be intercepted and diverted around the affected mining area. **[1816/1817.43(a)]**

☐ YES ☒ NO

If NO, explain why this is not necessary.

The watersheds within the proposed storage area will report to sediment ponds. All drainage received from adjacent areas will be received in the permit area and report to sediment ponds.

If YES, based on the definitions of "perennial" and "intermittent" streams as outlined in 62 Ill. Adm. Code 1701.Appendix A, does the Applicant propose to divert a perennial or intermittent stream?

☐ YES ☒ NO

If YES, also complete the appropriate items of Part 6.0: Streams.

5.2.3 Describe the timing in which all construction of the sediment ponds and surface drainage control structures will be completed. Include a discussion of the vegetation stabilization of these structures. **[1816.46(b)(3)/1817.46(b)(3); 1816.49(a)(7)/1817.49(a)(7)]**

Construction of sediment ponds and surface drainage control structures will be the first priority. After removal and salvaging of surface soil in the respective areas, pond and conveyance ditch construction will proceed immediately and prior to any other disturbance within the watersheds to the ponds. The construction of sediment ponds and surface drainage control will be completed before any other mine related

PART 5: Drainage Control

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5.2 General Drainage Control Description.

5.2.1 Will all surface drainage from the affected mining area be collected and treated prior to leaving the permit area? **[1816.46(b)(2)/1817.46(b)(2)]**

☒ YES ☐ NO

If NO, delineate the areas where an exemption is being requested on the Operations Map. Describe each location concerning the size of the disturbed area and the type of disturbances. Describe alternate sediment control measures to be utilized if proposed. Demonstrate that siltation structures and alternate sediment control measures (if not proposed) are not necessary for drainage from the disturbed areas to meet effluent limitations and water quality standards. **[1816.46(e)/1817.46(e)]**

Not Applicable

5.2.2 Will any surface drainage from unaffected areas be intercepted and diverted around the affected mining area. **[1816/1817.43(a)]**

☐ YES ☒ NO

If NO, explain why this is not necessary.

The watersheds within the proposed storage area will report to sediment ponds. All drainage received from adjacent areas will be received in the permit area and report to sediment ponds.

If YES, based on the definitions of "perennial" and "intermittent" streams as outlined in 62 Ill. Adm. Code 1701.Appendix A, does the Applicant propose to divert a perennial or intermittent stream?

☐ YES ☒ NO

If YES, also complete the appropriate items of Part 6.0: Streams.

5.2.3 Describe the timing in which all construction of the sediment ponds and surface drainage control structures will be completed. Include a discussion of the vegetation stabilization of these structures. **[1816.46(b)(3)/1817.46(b)(3); 1816.49(a)(7)/1817.49(a)(7)]**

Construction of sediment ponds and surface drainage control structures will be the first priority. After removal and salvaging of surface soil in the respective areas, pond and conveyance ditch construction will proceed immediately and prior to any other disturbance within the watersheds to the ponds. The construction of sediment ponds and surface drainage control will be completed before any other mine related

disturbance in the watershed occurs. Vegetative stabilization will be conducted as discussed in Part 12 of this submittal

5.3 Conveyance Ditch Design.

5.3.1 Does the Applicant propose to construct or modify any conveyance ditch that collects surface water drainage from affected mining areas and direct it to sediment ponds/treatment facilities? **[1816/1817.45(b)(3)]**

☒ YES ☐ NO

Does the Applicant propose to construct or modify any conveyance ditch that intercepts surface drainage from unaffected areas and direct it around the affected mining area? **[1816/1817.45(b)(4)]**

☐ YES ☒ NO

If either answer above is YES, complete Table 5.3.1: Conveyance Ditch Design Summary and complete the remaining questions through Part 5.3.4. Refer to Technical Guidance Document 2 for clarification.

5.3.1.1 Provide detailed design and construction calculations for the ditches listed in Table 5.3.1 as Attachment 5.3.1.1. **[1816.43/1817.43]**

5.3.1.2 For all ditches listed in Table 5.3.1, indicate the location of each on the Operations Map in relation to the proposed mining operations. Include the drainage area reporting to each segment of conveyance ditch on the Surface Drainage Control Plan Map and/or indicate the drawing(s) that provide the information required and provide a specific reference in the area below. **[1780.14(b)(6)/1784.23(b)(6)]**

See included Tables 5.3.1 & 5.4.1 and Attachments 5.3.1.1 Ditch Design and 5.4.1.2 Sediment Basin Design for detailed design information. Also see Streams Location & Watershed Map – Map 11.

5.3.1.3 Provide typical cross-sections for each ditch listed in Table 5.3.1 depicting the bottom width, side slopes, depth based on the appropriate precipitation event, and freeboard depth. (Indicate the drawing(s) that provide the information required and provide a specific reference in the area below.) **[1780.14(b)(6)/1784.23(b)(6)]**

See included Tables 5.3.1 & 5.4.1 and Attachments 5.3.1.1 Ditch Design and 5.4.1.2 Sediment Basin Design for detailed design information. See Operations Maps (Map 6) and Surface Drainage Control Map (Map 8).

5.3.1.4 Provide profiles for each ditch listed in Table 5.3.1 depicting the flow line slope and the depth based on the appropriate precipitation event. (Indicate the drawing(s) that provide the information required and provide a specific reference in the area below.) **[1780.14(b)(6)/1784.23(b)(6)]**

See included Tables 5.3.1 & 5.4.1 and Attachments 5.3.1.1 Ditch Design and 5.4.1.2 Sediment Basin Design for detailed design information.

5.3.1.5 Based on calculated flows, define areas that require supplemental erosion control such as rip rap or dry dams on the Surface Drainage Control Plan Map. Provide details and calculations

on the design of additional erosion control features to be employed during the operational life of the ditches. **[1780.14(b)(6)/1784.23(b)(6)]**

See included Tables 5.3.1 & 5.4.1 and Attachments 5.3.1.1 Ditch Design and 5.4.1.2 Sediment Basin Design for detailed design information.

5.3.1.6 Describe measures to ensure proper maintenance of diversion ditches, such as methods and frequency of cleaning of ditches that may receive excessive sediments and special equipment to be used for ditches designed with liners. **[1816.43(a)(2)(c)/1817.43(a)(2)(c)]**

Removal of temporary ditches and reclamation of same will be done with the approval of the Regulatory Authority with regard to the attainment of reclamation progress in the areas tributary to said ditches.

5.3.1.7 Provide details of the proposed erosion and sediment control measures to be employed during the construction of the proposed conveyance ditches. **[1816.43(a)(2)/1817.43(a)(2)]**

Vegetative stabilization will be conducted as discussed in Part 9 of the original approved 458 permit.

5.3.2 Are culvert(s) being proposed within the permit area including but not limited to ditches, stream crossings and/or transportation facilities.

☐ YES ☒ NO

If YES, complete Table 5.3.2: Culvert Design Summary and the following:

5.3.2.1 Provide design calculations for each culvert as Attachment 5.3.2.1. **[1816/1817.43(b)(3); 1816/1817.43(c)(3); 1816/1817.151(d)(1)]**

5.3.2.2 Provide a profile for each culvert, depicting appropriate design information including but not limited to length, diameter, slope, inlet and outlet elevations, maximum headwater depth and elevation of roadway or rail crossing. (Indicate the drawing(s) that provide the information required and provide a specific reference in the area below) **[1780/1784.29]**

Not Applicable

5.3.2.3 For culverts being proposed beneath transportation facilities (road/railway), provide measures to be implemented to insure structural capacity under live loads. **[1816/1817.151(d)(4)]**

Not Applicable

5.4 Impoundments. This section refers to modifications or design plans for all impoundments including sediment ponds, freshwater lakes, recirculation lakes (both incised and above grade) other than those covered under Part 3.12 "Coal Refuse Disposal Area". These structures are considered "impoundments" as defined in 62 Ill. Adm. Code 1701.Appendix A. Refer to Technical Guidance Document 2 for clarification.

5.4.1 Impoundment Design.

5.4.1.1 For all proposed impoundments, complete the Impoundment Design Table 5.4.1: Impoundment Design**. [1816.46(c)/1817.46(c)]**

5.4.1.2 Discuss the design basis for the impoundment calculations. Submit calculations used in spillway designs and determination of inflow volume and pond volume as Attachment 5.4.1.2.

See included Table 5.4.1 and Attachment 5.4.1.2 Sediment Basin Design for detailed design information.

5.4.1.3 Provide construction and maintenance details of dams, spillways, seepage control measures, and erosion control measures for inlets and outlets. Employ maps and cross sections where necessary. **[1816.45/1817.45; 1816.46/1817.46; 1816.49/1817.49]**

The operation and maintenance of each structure will be based on the design information in Table 5.4.1 and Attachment 5.4.1.2. Maintenance will be based on visual inspection and sediment accumulation. Should corrective action become necessary, a specific plan will be developed to correct the problem while maintaining compliance with environmental standards and operations.

5.4.1.4 Submit a typical cross section of the embankment(s), details of the principal and emergency spillways and a plan view of each pond at an appropriate scale showing pond bottom contours and points of inflow. (Indicate the drawing(s) that provide the information required and provide a specific reference in the area below) **[1816.45/1817.45; 1816.46/1817.46; 1816.49/1817.49]**

See included Table 5.4.1 and Attachment 5.4.1.2 Sediment Basin Design for detailed design information

5.4.1.5 If underground mining has or will occur beneath or adjacent to the proposed impoundment, the plan shall incorporate a technical discussion, survey and evaluation of the potential effect subsidence of the surface and subsurface strata would have on the structure. **[1780.25(a)(1)(D)/1784.16(a)(1)(D)]**

Not Applicable

5.4.1.6 Explain what criteria will be used to monitor and determine periodic and/or timely removal of sediments from sediment ponds, to maintain storage volume capacity. If sediment removal becomes necessary to maintain necessary pond treatment volume, explain how the sediment will be removed, where it will be disposed of, and what protective measures will be used to ensure the integrity of clay and/or geosynthetic liners, if applicable. **[1816.46(c)(1)(C)(vi)/1817.46(c)(1)(C)(vi)]**

Not Applicable

5.4.1.7 Will pH adjustment be necessary on any of the impoundments in order to meet the applicable State and Federal Standards? **[1780.21(h); 1784.14(g)]**

☐ YES ☒ NO

If YES, discuss in detail, along with detailed basis of design. The basis should include a detailed description of the proposed treatment facilities, process flow diagrams, and design calculations. **[1780.21(h)/1784.14(g)]**

Not Applicable

5.4.2 Impoundments Regulated by MSHA.

Are any of the impoundments proposed to be modified or constructed in Part 5.4.1 capable of impounding water or sediment to an elevation of five feet or more above the upstream toe of the structure and can have a storage volume of 20 acre-feet or more?

☐ YES ☒ NO

Are any of the impoundments proposed to be modified or constructed in Part 5.4.1 capable of impounding water or sediment to an elevation of twenty feet or more above the upstream toe of the structure?

☐ YES ☒ NO

If the answer to either above is YES, for each structure meeting or exceeding the size or other criteria of MSHA, 30 CFR 77.216(a), include the following additional information **[1780.25(a)(2)/1784.16(a)(2)]**:

5.4.2.1 The plan required to be submitted to the District Manager of the Mine Safety and Health Administration (MSHA) under 30 CFR 77.216 shall also be submitted to the Department as part of the permit application insofar as the MSHA informational design standard requirements are duplicative of the requirements of 62 Ill. Adm. Code 1780.25/1784.22. This plan shall be included as Attachment 5.4.2.1. **[1816/1817.49(a)(2)]**

5.4.2.2 Any certification issued by MSHA with respect to the design plan shall be included as Attachment 5.4.2.2. **[1816/1817.49(a)(2)]**

5.4.2.3 Provide a geotechnical analysis for stability design and construction specification requirements for the structure as Attachment 5.4.2.3. Include a description of each engineering design assumption and calculation with discussion of each alternative considered in selection design parameters and construction methods**. [1780.25(f); 1784.16(f)]**

Not Applicable

5.4.2.4 Describe the operation and maintenance procedures that will be used to ensure the stability of each structure. Include all monitoring instrumentation to be used. **[1780.25(a)(2)(C); 1784.16(a)(2)(C)]**

Not Applicable

5.4.3 Impoundment Reclamation.

For permanent impoundments, including sedimentation ponds, provide the following information:

5.4.3.1 Describe the proposed reclamation plans for each structure, including a time table and plans for removal and disposal of material. **[1780.25(a)(2)(D); 1784.16(a)(2)(D)]**

After slurry disposal is complete. The impoundment will be allowed to fill with 8 feet of cover and a discharged structure will be constructed.

For permanent impoundments, including sedimentation ponds, provide the following information:

5.4.3.2 Provide sufficient design data and calculations to substantiate that the design is in accordance with NRCS Engineering Standard 378 "Ponds" or NRCS Technical Release #60 "Earth Dams and Reservoirs". This information shall be included as Attachment 5.4.3.2. **[1816/1817.49(b)(2)]**

See Attachment 5.5.2 for design information for permanent impoundments.

5.4.3.3 Based on the location of the pond relative to existing or proposed surface mining disturbances, and the projected post mining reclamation and post mining land uses, provide an evaluation of the anticipated water quality to assure it will be suitable for the intended use. **[1816.49(b)(2)/1817.49(b)(2)]**

Water quality of final cut impoundments in Illinois has, historically, been more than adequate to meet the post-mining uses of recreation, fishing, stock watering, irrigation, etc. Given the reclamation standards to be used in reclamation of the entire watersheds to these lakes, post mining water quality will be excellent.

5.4.3.4 Describe the relationship of the impoundment to the post-mining land use. **[1816.49(b)(6)/1817.49(b)(6)]**

See the proposed Post-Mining Land Use Map for these relationships.

5.4.3.5 Describe methods of dropping surface runoff over excavated impoundment side slopes. Discuss design criteria to be employed for downdrain structures and perimeter diversions. **[1816.49(b)(7)/1817.49(b)(7)]**

Direct rainfall and sheet surface runoff will be conveyed downslope over the land surface as protected and stabilized with permanent vegetation. These areas will be stabilized prior to the removal of the diversion ditches surrounding the impoundment.

5.4.3.6 Plans of access roads and other use related facilities. **[1816.49(b)(4)/1817.49(b)(4)]**

No access roads or other use related facilities are to be constructed.

TABLE 5.3.1
Conveyance Ditch Design Summary

Ditch ID	Classification Permanent or temporary	Drainage Area (acres)	Peak Discharge (cfs)	Manning's Coefficient (N)	Channel Slope (ft/ft)	Channel Side Slopes (L/R)	Bottom Width (ft)	Flow Depth (ft)	Freeboard (ft)	Flow Velocity (ft/sec)
SP4-1	Temporary	4.204	17.775	0.035	0.77	3:1 / 3:1	5	0.86	0.3	2.72
SP4-2	Temporary	21.964	49.219	0.035	0.56	3:1 / 3:1	5	1.57	0.3	3.22
SP4-3 Sta 0+00 to Sta 8+61.31	Temporary	50.665	87.762	0.035	1.2	3:1 / 3:1	5	1.73	0.3	4.97
SP4-3 Sta 8+61.31 to 12+01.01	Temporary	50.665	87.762	0.035	0.5	3:1 / 3:1	5	3.61	0.3	1.53
SP4-3 Sta 12+01.01 to Sta 14+62.96	Temporary	50.665	87.762	0.035	1.0	3:1 / 3:1	5	1.81	0.3	4.65

* For design purposes, any ditch to remain longer than 2 years will be considered permanent in terms of storm event design (Minimum 10 yr 6 hr)
Ditches directly tributary to a sediment pond will be required to meet the required design storm of the pond spillway unless a lesser event is justified

Summary information based on 25 year-6 hour storm event

Runoff Curve Number and Runoff

Project: SP4-1 By: CLH Date: 12/27/19
Location: FRIENDSVILLE MINE

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Regraded Mined Land, Reclaimed (Fair)	79	C	1.817
Woods (Fair)	73	C	2.387

CN (weighted): 75.6
Total Area: 4.204 Acre

2. Runoff

Return Period:	10 YEAR	
Rainfall, P:	5.55	in
Runoff, Q:	2.9573	in
Runoff Volume:	1.0360	Acre-Ft

Time of Concentration (Tc) or Travel Time (Tt)

Length of Flow : 357.00 ft
Average Land Slope : 3.64 %
Time of Concentration : 0.137 hrs, 8.2 mins

Graphical Peak Discharge

Drainage area:.....A = 4.204 Acres

Runoff Curve Number:.....CN = 76

Time of Concentration:.....Tc = 8.24 min

Storm Type:..... = II

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 5.55

4. Initial abstraction, Ia..... = 0.6316

5. Compute Ia/P..... = 0.1138

6. Unit peak discharge, qu.....csm/in = 903.435

7. Runoff,Q.....in = 2.995

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 17.775

SP4-1-Runoff Curve Number and Runoff.txt

Runoff Curve Number and Runoff Thu Dec 26 11:48:12 2019

Project: DDSP4-1 By: CLH Date: 12/26/19
Location: FRV Checked: Date:
Present

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Woods (Fair)	73	C	2.387
Regraded Mined Land, Reclaimed (Fair)	79	C	1.817

CN (weighted): 75.6
Total Area: 4.204 Acre

2. Runoff

Return Period:	10 YEAR	
Rainfall, P:	5.55	in
Runoff, Q:	2.9573	in
Runoff Volume:	1.0360	Acre-Ft

Time of Concentration (SCS) Thu Dec 26 11:49:32 2019

Project: DDSP4-1 By: CLH Date: 12/26/19
Location: FRV Checked: Date: 12/26/19
Present

Curve Number : 76
Length of Flow : 357.00 ft
Average Land Slope : 3.64 %

Time of Concentration : 0.137 hrs, 8.2 mins

Graphical Peak Discharge Thu Dec 26 11:50:01 2019

Project: DDSP4-1 By: CLH Date: 12/26/19

Location: FRV Checked: Date:

Present

1. Data:

   Drainage area:.....A = 4.2040Acres

   Runoff Curve Number:.....CN = 76

   Time of Concentration:.....Tc = 8.24 min

   Storm Type:..... = II

   Pond and swamp areas spread throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 5.550

4. Initial abstraction, Ia..... = 0.6316

5. Compute Ia/P..... = 0.1138

6. Unit peak discharge, qu.....csm/in = 903.435

7. Runoff,Q.....in = 2.995

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 17.775

DITCH ANALYSIS WORKSHEET

INPUT DATA

Date: 12/26/2019
Project Title: Diversion Ditch SP4-1
Location: Friendsville Mine-PERMIT 458
Designer: CLH

Channel Slope = 0.0077
Manning's "n" = 0.035
Bottom Width = 5
Left Sideslope = 3
Right Sideslope = 3
Depth Increment = 0.2

OUTPUT DATA

Depth (feet)	Q (cfs)	Q (MGD)	Velocity (ft/sec)	Froude Number	Area (ft^2)	P_{wet} (feet)	R_h (feet	$R_h^{4/3}$ ($ft^{4/3}$)	T (feet)	$V^2/2g$ (ft)	E (ft)
0.00	0.00	0.000	0.00	0.000	0	0.00	0.00	0.00	0.00	0.00000	0.00000
0.20	1.32	0.856	1.18	0.490	1.12	6.26	0.18	0.10	6.20	0.02171	0.22171
0.40	4.41	2.848	1.78	0.541	2.48	7.53	0.33	0.23	7.40	0.04902	0.44902
0.60	9.11	5.887	2.23	0.571	4.08	8.79	0.46	0.36	8.60	0.07740	0.67740
0.80	15.49	10.011	2.62	0.593	5.92	10.06	0.59	0.49	9.80	0.10629	0.90629
0.86	17.78	11.488	2.72	0.599	6.53	10.44	0.62	0.53	10.16	0.11516	0.97597

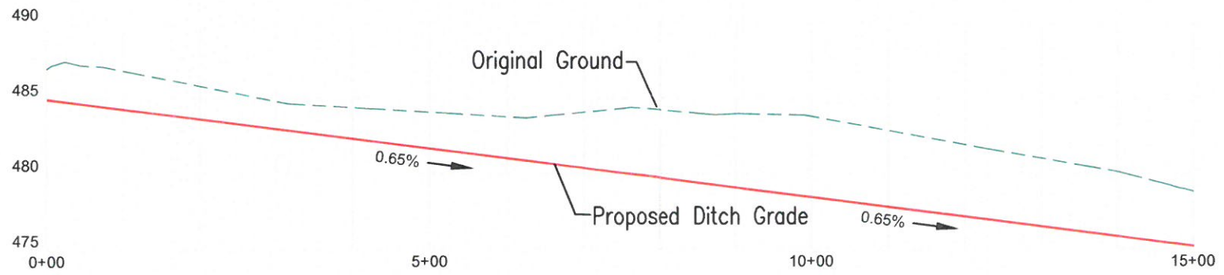
DESCRIPTION

This is a worksheet which will calculate uniform flow data for trapezoidal, triangular, & rectangular channels.

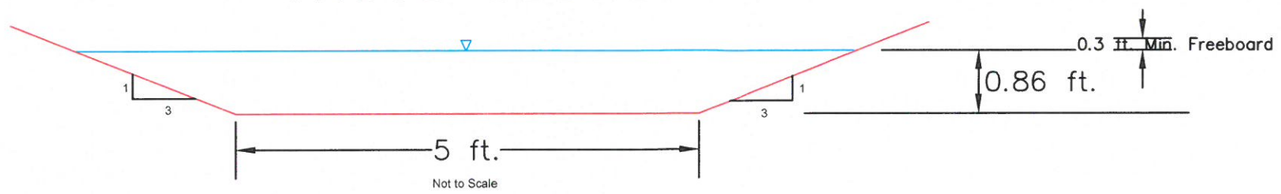
This Worksheet Based on Manning Equation
Q= Flow rate
A=Cross sectional area of water in channel
P_{wet}=Wetted Perimeter
R_h=Hydraulic Radius (A/P)
V=Velocity of water in channel (V=Q/A)
E=Energy head (E=y+V2/2g)
T=Top Width
**For Rectangular Channel Z=0 (Side slopes)
**For Triangular Channel bottom width=0

Drainage area:A = 4.204 Acres
Runoff Curve Number:CN = 76
Time of Concentration:Tc (min.) = 8.24
Storm Type: II
Frequency:yr = 10
Rainfall,P(24-hour): 5.55 in.
Runoff,Q: 2.995 in.
Peak Discharge,qp: 17.775 cfs

PROFILE



CROSS SECTION



Channel Type: Trapezoidal, Equal Side Slopes

Dimensions: Left Side Slope 3:1
Right Side Slope 3:1
Base Dimension: 5

Wetted Perimeter: 10.44
Area of Wetted Cross Section: 6.53

Discharge: 17.76 cfs
Depth of Flow: 0.86 feet
Velocity: 2.72 fps
Channel Lining: Earth,F. Uniform,Weeds/Grass
Freeboard: 0.3 feet minimum

White Stallion Energy, LLC
250 CROSS POINTE BLVD.
EVANSVILLE, INDIANA 47715

Friendsville Mine
Diversion Ditch SP4-1

QUADRANGLE: Mt. Carmel
APPLICATION NO.: 458 Permit
COUNTY: Wabash
MINE NAME: FRIENDSVILLE MINE

DATE: 12/27/2019
DRAWN BY: CLH
SCALE: Horizontal: 1"=100'
Vertical 1"=5'

Runoff Curve Number and Runoff

Project: SP4-2 By: CLH Date: 12/27/19
Location: FRIENDSVILLE MINE

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Regraded Mined Land, Reclaimed (Fair)	79	C	21.964
Woods (Fair)	73	C	0.0

CN (weighted): 79.0
Total Area: 21.964 Acre

2. Runoff

Return Period:	10 YEAR	
Rainfall, P:	5.55	in
Runoff, Q:	3.2806	in
Runoff Volume:	6.0046	Acre-Ft

Time of Concentration (Tc) or Travel Time (Tt)

Length of Flow	: 1266.0 ft
Average Land Slope	: 0.85 %
Time of Concentration	: 0.716 hrs, 42.9 mins

Graphical Peak Discharge

Drainage area:.....A = 21.964 Acres

Runoff Curve Number:.....CN = 79

Time of Concentration:.....Tc = 42.93 min

Storm Type:..... = II

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 5.55

4. Initial abstraction, Ia..... = 0.5316

5. Compute Ia/P..... = 0.0958

6. Unit peak discharge, qu.....csm/in = 437.162

7. Runoff,Q.....in = 3.281

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 49.219

Runoff Curve Number and Runoff Thu Dec 26 11:51:13 2019

Project: DDSP4-2 By: CLH Date: 12/26/19
Location: FRV Checked: Date:
Present

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Regraded Mined Land, Reclaimed (Fair)	79	C	21.964

CN (weighted): 79.0
Total Area: 21.964 Acre

2. Runoff

Return Period:	10 YEAR	
Rainfall, P:	5.55	in
Runoff, Q:	3.2806	in
Runoff Volume:	6.0046	Acre-Ft

Time of Concentration (SCS) Thu Dec 26 11:52:35 2019

Project: DDSP4-2 By: CLH Date: 12/26/19
Location: FRV Checked: Date: 12/26/19
Present

Curve Number : 79
Length of Flow : 1266.00 ft
Average Land Slope : 0.85 %

Time of Concentration : 0.716 hrs, 42.9 mins

Graphical Peak Discharge Thu Dec 26 11:53:12 2019

Project: DDSP4-2 By: CLH Date: 12/26/19

Location: FRV Checked: Date:

Present

1. Data:

   Drainage area:.....A = 21.9640Acres

   Runoff Curve Number:.....CN = 79

   Time of Concentration:.....Tc = 42.93 min

   Storm Type:..... = II

   Pond and swamp areas spread throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 5.550

4. Initial abstraction, Ia..... = 0.5316

5. Compute Ia/P..... = 0.0958

6. Unit peak discharge, qu.....csm/in = 437.162

7. Runoff,Q.....in = 3.281

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 49.219

DITCH ANALYSIS WORKSHEET

INPUT DATA

Date: 12/26/2019
Project Title: Diversion Ditch SP4-2
Location: Friendsville Mine-PERMIT 458
Designer: CLH

Channel Slope = 0.0056
Manning's "n" = 0.035
Bottom Width = 5
Left Sideslope = 3
Right Sideslope = 3
Depth Increment = 0.1

DESCRIPTION

This is a worksheet which will calculate uniform flow data for trapezoidal, triangular, & rectangular channels.

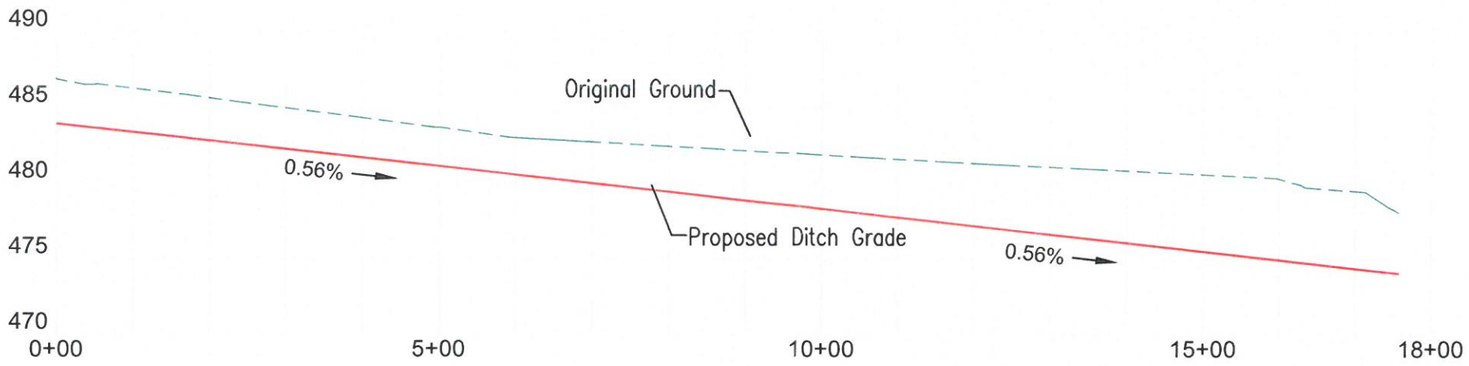
This Worksheet Based on Manning Equation
Q= Flow rate
A=Cross sectional area of water in channel
P_{wet}=Wetted Perimeter
R_h=Hydraulic Radius (A/P)
V=Velocity of water in channel (V=Q/A)
E=Energy head (E=y+V2/2g)
T=Top Width
**For Rectangular Channel Z=0 (Side slopes)
**For Triangular Channel bottom width=0

OUTPUT DATA

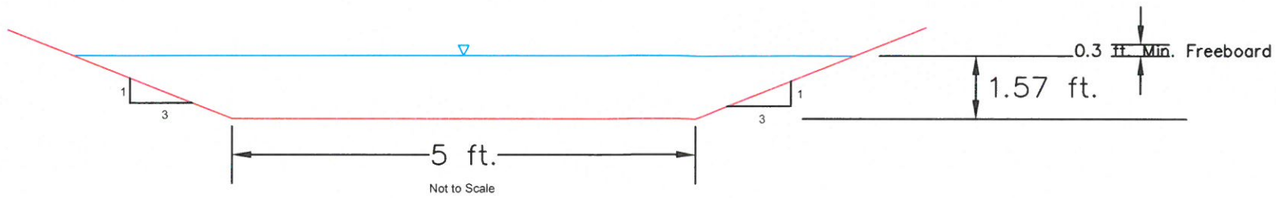
Depth (feet)	Q (cfs)	Q (MGD)	Velocity (ft/sec)	Froude Number	Area (ft^2)	P_{wet} (feet)	R_h (feet	$R_h^{4/3}$ ($ft^{4/3}$)	T (feet)	$V^2/2g$ (ft)	E (ft)
0.00	0.00	0.000	0.00	0.000	0	0.00	0.00	0.00	0.00	0.00000	0.00000
0.10	0.35	0.225	0.66	0.377	0.53	5.63	0.09	0.04	5.60	0.00671	0.10671
0.20	1.13	0.730	1.01	0.418	1.12	6.26	0.18	0.10	6.20	0.01579	0.21579
0.30	2.27	1.468	1.28	0.443	1.77	6.90	0.26	0.16	6.80	0.02556	0.32556
0.40	3.76	2.429	1.52	0.461	2.48	7.53	0.33	0.23	7.40	0.03565	0.43565
0.50	5.59	3.612	1.72	0.475	3.25	8.16	0.40	0.29	8.00	0.04592	0.54592
0.60	7.77	5.021	1.90	0.487	4.08	8.79	0.46	0.36	8.60	0.05629	0.65629
0.70	10.31	6.660	2.07	0.497	4.97	9.43	0.53	0.43	9.20	0.06676	0.76676
0.80	13.21	8.537	2.23	0.506	5.92	10.06	0.59	0.49	9.80	0.07730	0.87730
0.90	16.49	10.658	2.38	0.514	6.93	10.69	0.65	0.56	10.40	0.08792	0.98792
1.00	20.16	13.030	2.52	0.521	8.00	11.32	0.71	0.63	11.00	0.09862	1.09862
1.10	24.23	15.662	2.65	0.527	9.13	11.96	0.76	0.70	11.60	0.10940	1.20940
1.20	28.72	18.562	2.78	0.533	10.32	12.59	0.82	0.77	12.20	0.12025	1.32025
1.30	33.63	21.736	2.91	0.539	11.57	13.22	0.88	0.84	12.80	0.13120	1.43120
1.40	38.98	25.194	3.03	0.544	12.88	13.85	0.93	0.91	13.40	0.14222	1.54222
1.50	44.78	28.942	3.14	0.549	14.25	14.49	0.98	0.98	14.00	0.15334	1.65334
1.57	49.22	31.811	3.22	0.552	15.27	14.94	1.02	1.03	14.43	0.16136	1.73300

Drainage area:A = 21.964 Acres
Runoff Curve Number:CN = 79
Time of Concentration:Tc (min.) = 42.93
Storm Type: II
Frequency:yr = 10
Rainfall,P(24-hour): 5.55 in.
Runoff,Q: 3.281 in.
Peak Discharge,qp: 49.219 cfs

PROFILE



CROSS SECTION



Channel Type: Trapezoidal, Equal Side Slopes

Dimensions: Left Side Slope 3:1
Right Side Slope 3:1
Base Dimension: 5

Wetted Perimeter: 14.94
Area of Wetted Cross Section: 15.27

Discharge: 49.22 cfs
Depth of Flow: 1.57 feet
Velocity: 3.22 fps
Channel Lining: Earth,F. Uniform,Weeds/Grass
Freeboard: 0.3 feet minimum

White Stallion Energy, LLC
250 CROSS POINTE BLVD.
EVANSVILLE, INDIANA 47715

Friendsville Mine
Diversion Ditch SP4-2

QUADRANGLE: Mt. Carmel
APPLICATION NO.: 458 Permit
COUNTY: Wabash
MINE NAME: FRIENDSVILLE MINE

DATE: 12/27/2019
SCALE: Horizontal: 1"=200'
Vertical 1"=10'
DRAWN BY: CLH

Runoff Curve Number and Runoff

Project: SP4-3 By: CLH Date: 12/27/19
Location: FRIENDSVILLE MINE

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Regraded Mined Land, Reclaimed (Fair)	79	C	48.278
Woods (Fair)	73	C	2.387

CN (weighted): 78.7
Total Area: 50.665 Acre

2. Runoff

Return Period:	10 YEAR	
Rainfall, P:	5.55	in
Runoff, Q:	3.2533	in
Runoff Volume:	13.7358	Acre-Ft

Time of Concentration (Tc) or Travel Time (Tt)

Length of Flow : 2124.0 ft
Average Land Slope : 0.79 %
Time of Concentration : 1.123 hrs, 67.4 mins

Graphical Peak Discharge

Drainage area:.....A = 50.665 Acres

Runoff Curve Number:.....CN = 79

Time of Concentration:.....Tc = 1.12 hours

Storm Type:..... = II

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 5.55

4. Initial abstraction, Ia..... = 0.5316

5. Compute Ia/P..... = 0.0958

6. Unit peak discharge, qu.....csm/in = 337.928

7. Runoff,Q.....in = 3.281

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 87.762

DDSP4-3-Runoff Curve Number and Runoff.txt

Runoff Curve Number and Runoff Fri Dec 27 12:48:24 2019

Project: DD-SP4-3 By: CLH Date: 12/27/19
Location: FRV Checked: Date:
Present

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Regraded Mined Land, Reclaimed (Fair)	79	C	48.278
Woods (Fair)	73	C	2.387

CN (weighted): 78.7
Total Area: 50.665 Acre

2. Runoff

Return Period:	10 YEAR	
Rainfall, P:	5.55	in
Runoff, Q:	3.2533	in
Runoff Volume:	13.7358	Acre-Ft

DDSP4-3-Time of Concentration (SCS).txt

Time of Concentration (SCS) Fri Dec 27 12:53:18 2019

Project: DD-SP4-3 By: CLH Date: 12/27/19
Location: FRV Checked: Date: 12/27/19
Present

Curve Number : 79
Length of Flow : 2124.00 ft
Average Land Slope : 0.79 %

Time of Concentration : 1.123 hrs, 67.4 mins

Graphical Peak Discharge Fri Dec 27 12:53:43 2019

Project: DD-SP4-3 By: CLH Date: 12/27/19

Location: FRV Checked: Date:

Present

1. Data:

   Drainage area:.....A = 50.6650Acres

   Runoff Curve Number:.....CN = 79

   Time of Concentration:.....Tc = 1.12 hour

   Storm Type:..... = II

   Pond and swamp areas spread throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 5.550

4. Initial abstraction, Ia..... = 0.5316

5. Compute Ia/P..... = 0.0958

6. Unit peak discharge, qu.....csm/in = 337.928

7. Runoff,Q.....in = 3.281

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 87.762

DITCH ANALYSIS WORKSHEET

INPUT DATA	
Date:	12/26/2019
Project Title:	Diversion Ditch SP4-3
Location:	Friendsville Mine-PERMIT 458
Designer:	CLH
Channel Slope =	0.012
Manning's "n" =	0.035
Bottom Width =	5
Left Sideslope =	3
Right Sideslope =	3
Depth Increment =	0.1

DESCRIPTION

This is a worksheet which will calculate uniform flow data for trapezoidal, triangular, & rectangular channels.

This Worksheet Based on Manning Equation
Q= Flow rate
A=Cross sectional area of water in channel
P_{wet}=Wetted Perimeter
R_h=Hydraulic Radius (A/P)
V=Velocity of water in channel (V=Q/A)
E=Energy head (E=y+V2/2g)
T=Top Width
**For Rectangular Channel Z=0 (Side slopes)
**For Triangular Channel bottom width=0

OUTPUT DATA STA. 0+00 to STA. 8+61.31

Depth (feet)	Q (cfs)	Q (MGD)	Velocity (ft/sec)	Froude Number	Area (ft^2)	P_{wet} (feet)	R_h (feet	$R_h^{4/3}$ ($ft^{4/3}$)	T (feet)	$V^2/2g$ (ft)	E (ft)
0.00	0.00	0.000	0.00	0.000	0	0.00	0.00	0.00	0.00	0.00000	0.00000
0.10	0.51	0.330	0.96	0.551	0.53	5.63	0.09	0.04	5.60	0.01438	0.11438
0.20	1.65	1.068	1.48	0.612	1.12	6.26	0.18	0.10	6.20	0.03383	0.23383
0.30	3.32	2.149	1.88	0.649	1.77	6.90	0.26	0.16	6.80	0.05478	0.35478
0.40	5.50	3.555	2.22	0.675	2.48	7.53	0.33	0.23	7.40	0.07640	0.47640
0.50	8.18	5.288	2.52	0.696	3.25	8.16	0.40	0.29	8.00	0.09839	0.59839
0.60	11.37	7.350	2.79	0.713	4.08	8.79	0.46	0.36	8.60	0.12063	0.72063
0.70	15.09	9.750	3.04	0.728	4.97	9.43	0.53	0.43	9.20	0.14305	0.84305
0.80	19.34	12.497	3.27	0.741	5.92	10.06	0.59	0.49	9.80	0.16565	0.96565
0.90	24.14	15.602	3.48	0.752	6.93	10.69	0.65	0.56	10.40	0.18840	1.08840
1.00	29.51	19.075	3.69	0.762	8.00	11.32	0.71	0.63	11.00	0.21133	1.21133
1.10	35.47	22.927	3.89	0.772	9.13	11.96	0.76	0.70	11.60	0.23442	1.33442
1.20	42.04	27.172	4.07	0.781	10.32	12.59	0.82	0.77	12.20	0.25769	1.45769
1.30	49.23	31.818	4.26	0.789	11.57	13.22	0.88	0.84	12.80	0.28114	1.58114
1.40	57.06	36.880	4.43	0.796	12.88	13.85	0.93	0.91	13.40	0.30477	1.70477
1.50	65.55	42.367	4.60	0.804	14.25	14.49	0.98	0.98	14.00	0.32859	1.82859
1.60	74.72	48.292	4.77	0.810	15.68	15.12	1.04	1.05	14.60	0.35260	1.95260
1.70	84.58	54.666	4.93	0.817	17.17	15.75	1.09	1.12	15.20	0.37681	2.07681
1.73	87.76	56.722	4.97	0.819	17.64	15.95	1.11	1.14	15.38	0.38430	2.11511

Drainage area:A = 50.665 Acres
Runoff Curve Number:CN = 79
Time of Concentration:Tc (hr.) = 1.12
Storm Type: II
Frequency:yr = 10
Rainfall,P(24-hour): 5.55 in.
Runoff,Q: 3.281 in.
Peak Discharge,qp: 87.762 cfs

DITCH ANALYSIS WORKSHEET

INPUT DATA

Date: 12/26/2019
Project Title: Diversion Ditch SP4-3
Location: Friendsville Mine-PERMIT 458
Designer: CLH

Channel Slope = 0.0005
Manning's "n" = 0.035
Bottom Width = 5
Left Sideslope = 3
Right Sideslope = 3
Depth Increment = 0.2

DESCRIPTION

This is a worksheet which will calculate uniform flow data for trapezoidal, triangular, & rectangular channels.

This Worksheet Based on Manning Equation
Q= Flow rate
A=Cross sectional area of water in channel
P_{wet}=Wetted Perimeter
R_h=Hydraulic Radius (A/P)
V=Velocity of water in channel (V=Q/A)
E=Energy head (E=y+V2/2g)
T=Top Width
**For Rectangular Channel Z=0 (Side slopes)
**For Triangular Channel bottom width=0

OUTPUT DATA STA. 8+61.31 to STA. 12+01.01

Depth (feet)	Q (cfs)	Q (MGD)	Velocity (ft/sec)	Froude Number	Area (ft^2)	P_{wet} (feet)	R_h (feet	$R_h^{4/3}$ ($ft^{4/3}$)	T (feet)	$V^2/2g$ (ft)	E (ft)
0.00	0.00	0.000	0.00	0.000	0	0.00	0.00	0.00	0.00	0.00000	0.00000
0.20	0.34	0.218	0.30	0.125	1.12	6.26	0.18	0.10	6.20	0.00141	0.20141
0.40	1.12	0.726	0.45	0.138	2.48	7.53	0.33	0.23	7.40	0.00318	0.40318
0.60	2.32	1.500	0.57	0.146	4.08	8.79	0.46	0.36	8.60	0.00503	0.60503
0.80	3.95	2.551	0.67	0.151	5.92	10.06	0.59	0.49	9.80	0.00690	0.80690
1.00	6.02	3.894	0.75	0.156	8	11.32	0.71	0.63	11.00	0.00881	1.00881
1.20	8.58	5.546	0.83	0.159	10.32	12.59	0.82	0.77	12.20	0.01074	1.21074
1.40	11.65	7.528	0.90	0.163	12.88	13.85	0.93	0.91	13.40	0.01270	1.41270
1.60	15.25	9.858	0.97	0.165	15.68	15.12	1.04	1.05	14.60	0.01469	1.61469
1.80	19.42	12.554	1.04	0.168	18.72	16.38	1.14	1.19	15.80	0.01672	1.81672
2.00	24.19	15.635	1.10	0.170	22.00	17.65	1.25	1.34	17.00	0.01878	2.01878
2.20	29.58	19.120	1.16	0.173	25.52	18.91	1.35	1.49	18.20	0.02087	2.22087
2.40	35.63	23.027	1.22	0.175	29.28	20.18	1.45	1.64	19.40	0.02299	2.42299
2.60	42.35	27.373	1.27	0.176	33.28	21.44	1.55	1.80	20.60	0.02515	2.62515
2.80	49.78	32.175	1.33	0.178	37.52	22.71	1.65	1.95	21.80	0.02734	2.82734
3.00	57.95	37.452	1.38	0.180	42.00	23.97	1.75	2.11	23.00	0.02956	3.02956
3.20	66.87	43.219	1.43	0.182	46.72	25.24	1.85	2.27	24.20	0.03181	3.23181
3.40	76.58	49.494	1.48	0.183	51.68	26.50	1.95	2.44	25.40	0.03409	3.43409
3.60	87.10	56.292	1.53	0.185	56.88	27.77	2.05	2.60	26.60	0.03641	3.63641
3.61	87.76	56.722	1.53	0.185	57.20	27.85	2.05	2.61	26.67	0.03655	3.64871

Drainage area:A = 50.665 Acres
Runoff Curve Number:CN = 79
Time of Concentration:Tc (hr.) = 1.12
Storm Type: II
Frequency:yr = 10
Rainfall,P(24-hour): 5.55 in.
Runoff,Q: 3.281 in.
Peak Discharge,qp: 87.762 cfs

DITCH ANALYSIS WORKSHEET

INPUT DATA	
Date:	12/26/2019
Project Title:	Diversion Ditch SP4-3
Location:	Friendsville Mine-PERMIT 458
Designer:	CLH
Channel Slope =	0.01
Manning's "n" =	0.035
Bottom Width =	5
Left Sideslope =	3
Right Sideslope =	3
Depth Increment =	0.2

DESCRIPTION

This is a worksheet which will calculate uniform flow data for trapezoidal, triangular, & rectangular channels.

OUTPUT DATA STA. 12+01.01 to STA. 14+62.96

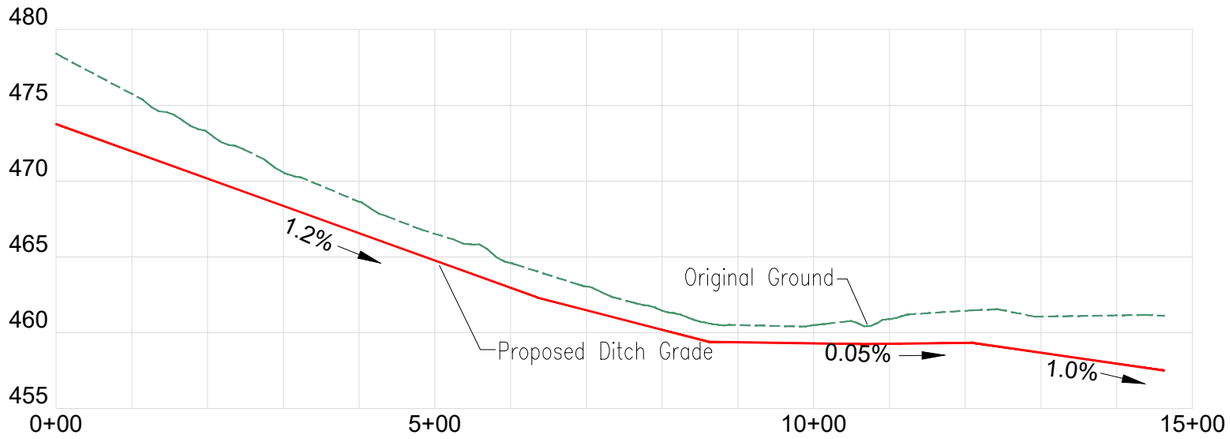
Depth (feet)	Q (cfs)	Q (MGD)	Velocity (ft/sec)	Froude Number	Area (ft^2)	P_{wet} (feet)	R_h (feet	$R_h^{4/3}$ ($ft^{4/3}$)	T (feet)	$V^2/2g$ (ft)	E (ft)
0.00	0.00	0.000	0.00	0.000	0	0.00	0.00	0.00	0.00	0.00000	0.00000
0.20	1.51	0.975	1.35	0.559	1.12	6.26	0.18	0.10	6.20	0.02819	0.22819
0.40	5.02	3.246	2.02	0.616	2.48	7.53	0.33	0.23	7.40	0.06367	0.46367
0.60	10.38	6.709	2.54	0.651	4.08	8.79	0.46	0.36	8.60	0.10052	0.70052
0.80	17.65	11.408	2.98	0.676	5.92	10.06	0.59	0.49	9.80	0.13804	0.93804
1.00	26.94	17.413	3.37	0.696	8	11.32	0.71	0.63	11.00	0.17611	1.17611
1.20	38.38	24.804	3.72	0.713	10.32	12.59	0.82	0.77	12.20	0.21474	1.41474
1.40	52.09	33.667	4.04	0.727	12.88	13.85	0.93	0.91	13.40	0.25397	1.65397
1.60	68.21	44.084	4.35	0.740	15.68	15.12	1.04	1.05	14.60	0.29383	1.89383
1.80	86.86	56.142	4.64	0.751	18.72	16.38	1.14	1.19	15.80	0.33434	2.13434
1.81	87.76	56.722	4.65	0.752	18.86	16.44	1.15	1.20	15.85	0.33617	2.14514

This Worksheet Based on Manning Equation
Q= Flow rate
A=Cross sectional area of water in channel
P_{wet}=Wetted Perimeter
R_h=Hydraulic Radius (A/P)
V=Velocity of water in channel (V=Q/A)
E=Energy head (E=y+V2/2g)
T=Top Width
**For Rectangular Channel Z=0 (Side slopes)
**For Triangular Channel bottom width=0

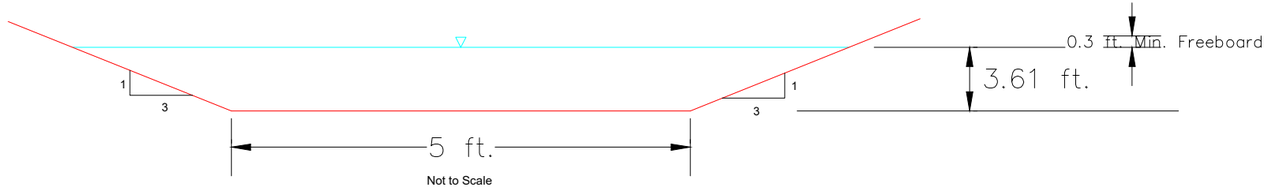
Drainage area:A = 50.665 Acres
Runoff Curve Number:CN = 79
Time of Concentration:Tc (hr.) = 1.12
Storm Type: II
Frequency:yr = 10
Rainfall,P(24-hour): 5.55 in.
Runoff,Q: 3.281 in.
Peak Discharge,qp: 87.762 cfs

Attachment 5.3.1

PROFILE



CROSS SECTION



Channel Type: Trapezoidal, Equal Side Slopes

Dimensions: Left Side Slope 3:1
Right Side Slope 3:1
Base Dimension: 5

Wetted Perimeter: 27.85
Area of Wetted Cross Section: 57.20

Discharge: 87.76 cfs
Depth of Flow: 3.61 feet
Velocity: 4.97 fps
Channel Lining: Earth,F. Uniform,Weeds/Grass
Freeboard: 0.3 feet minimum

White Stallion Energy, LLC
250 CROSS POINTE BLVD.
EVANSVILLE, INDIANA 47715

Friendsville Mine
Diversion Ditch SP4-3

QUADRANGLE: Mt. Carmel
APPLICATION NO.: 458 Permit
COUNTY: Wabash
MINE NAME: FRIENDSVILLE MINE

DATE: 12/27/2019
SCALE: Horizontal: 1"=200'
Vertical 1"=10'
DRAWN BY: CLH

TABLE 5.4.1
Impoundment Design

Pond ID	NPDES #	MSHA #	Total Drainage Area (acres)	Disturbed Drainage Area (acres)	Total Calculated Inflow from Design Storm (ac-ft)	Calculated Inflow to be Treated (Minimum 10 Hour Detention Time) (ac-ft)	Sediment Storage Volume (ac-ft)	Volume Below Primary Spillway Elevation (ac-ft)	Volume Below Emergency Spillway Elevation (ac-ft)	Embankment Height from Upstream Toe to Crest (ft)	Volume Impounded above Upstream Toe (ac-ft)
SP4	N/A	N/A	78.5	78.5	5.6679	N/A	N/A	N/A	N/A	**	**

** All impoundments are proposed as incised structures

Runoff Curve Number and Runoff

Project: SP4 By: CLH Date: 12/27/19
Location: FRIENDSVILLE MINE

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Regraded Mined Land, Reclaimed (Fair)	79	C	23.781
Woods (Fair)	73	C	2.387

CN (weighted): 78.5
Total Area: 26.168 Acre

2. Runoff

Return Period:	25 YEAR	
Rainfall, P:	4.82	in
Runoff, Q:	2.5991	in
Runoff Volume:	5.6679	Acre-Ft

Time of Concentration (Tc) or Travel Time (Tt)

Length of Flow : 1266.00 ft
Average Land Slope : 0.85 %
Time of Concentration : 0.738 hrs, 44.3 mins

Graphical Peak Discharge

Drainage area:.....A = 26.1680 Acres

Runoff Curve Number:.....CN = 78

Time of Concentration:.....Tc = 0.74 hours

Storm Type:..... = II

2. Frequency.....yr = 25

3. Rainfall,P(6-hour).....in = 4.82

4. Initial abstraction, Ia..... = 0.5641

5. Compute Ia/P..... = 0.1170

6. Unit peak discharge, qu.....csm/in = 422.777

7. Runoff,Q.....in = 2.560

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 44.246

Runoff Curve Number and Runoff Fri Dec 27 14:07:25 2019

Project: SP4 Spillway By: CLH Date: 12/27/19
Location: FRV Checked: Date:
Present

1. Runoff Curve Number (CN)

Cover description	CN	Soil Group	Area(Acre)
Regraded Mined Land, Reclaimed (Fair)	79	C	23.781
Woods (Fair)	73	C	2.387

CN (weighted): 78.5
Total Area: 26.168 Acre

2. Runoff

Return Period:	25 YEAR	
Rainfall, P:	4.82	in
Runoff, Q:	2.5991	in
Runoff Volume:	5.6679	Acre-Ft

Time of Concentration (SCS) Fri Dec 27 14:08:07 2019

Project: SP4 Spillway By: CLH Date: 12/27/19
Location: FRV Checked: Date: 12/27/19
Present

Curve Number : 78
Length of Flow : 1266.00 ft
Average Land Slope : 0.85 %

Time of Concentration : 0.738 hrs, 44.3 mins

Graphical Peak Discharge Fri Dec 27 14:08:42 2019

Project: SP4 Spillway By: CLH Date: 12/27/19

Location: FRV Checked: Date:

Present

1. Data:

   Drainage area:.....A = 26.1680Acres

   Runoff Curve Number:.....CN = 78

   Time of Concentration:.....Tc = 0.74 hour

   Storm Type:..... = II

   Pond and swamp areas spread throughout watershed..... = 0.00 percent of A
   0.0000 Acres

2. Frequency.....yr = 10

3. Rainfall,P(24-hour).....in = 4.820

4. Initial abstraction, Ia..... = 0.5641

5. Compute Ia/P..... = 0.1170

6. Unit peak discharge, qu.....csm/in = 422.777

7. Runoff,Q.....in = 2.560

8. Pond & swap adjustment factor,...Fp = 1.00

9. Peak Discharge,qp.....cfs = 44.246

SPILLWAY WORKSHEET

INPUT DATA		OUTPUT DATA
Date:	12/27/2019	
Project Title:	SP4 Spillway	Q=44.246 cfs
Location:	Friendsville Permit 458	
Designer:	CLH	

		Depth	Q	Q	Velocity	Froude	Area	P_{wet}	R_h	$R_h^{4/3}$	T	$V^2/2g$	E
		(feet)	(cfs)	(MGD)	(ft/sec)	Number	(ft^2)	(feet)	(feet	($ft^{4/3}$)	(feet)	(ft)	(ft)
Channel Slope =	0.076	0.00	0.00	0.000	0.00	0.000	0	0.00	0.00	0.00	0.00	0.00000	0.00000
Manning's "n" =	0.04	0.10	3.33	2.151	2.18	1.224	1.53	15.63	0.10	0.05	15.60	0.07346	0.17346
Bottom Width =	15	0.20	10.63	6.869	3.41	1.368	3.12	16.26	0.19	0.11	16.20	0.18018	0.38018
Left Sideslope =	3	0.30	21.02	13.587	4.41	1.458	4.77	16.90	0.28	0.19	16.80	0.30161	0.60161
Right Sideslope =	3	0.40	34.18	22.093	5.28	1.523	6.48	17.53	0.37	0.27	17.40	0.43209	0.83209
Depth Increment =	0.1	0.47	44.25	28.597	5.79	1.559	7.64	17.95	0.43	0.32	17.79	0.52130	0.98701

DESCRIPTION

This is a worksheet which will calculate uniform flow data for trapezoidal, triangular, & rectangular channels.

This Worksheet Based on Manning Equation
Q= Flow rate
A=Cross sectional area of water in channel
P_{wet}=Wetted Perimeter
R_h=Hydraulic Radius (A/P)
V=Velocity of water in channel (V=Q/A)
E=Energy head (E=y+V2/2g)
T=Top Width
**For Rectangular Channel Z=0 (Side slopes)
**For Triangular Channel bottom width=0

Drainage area:A = 26.17 Acres
Runoff Curve Number:CN = 78
Time of Concentration:Tc = 0.74
Storm Type: II
Frequency: 25yr 6 hr
Rainfall,P(6-hour): 4.82 in.
Runoff,Q: 2.161 in.
Peak Discharge,qp: 44.246 cfs

	A	B	C	D	E	F	G	H	
1	**Trapezoidal Riprap-Lined Waterway Design.xlsm**							V 11.2019	
2	Landowner			County	Wabash				
3	Computed By			Date	2/24/2020			11/15/2019	
4	Checked by			Date					
5	*Note: Macros must be enabled in this spreadsheet in order for the "Solve" button to work.*								
6	Design flow, Q=	44.25	cfs			WW horiz. Length=			ft
7	Slope, S=	8%	ft/ft =	13.16	:1	U/S WW F.L. elev=			ft
8	Bottom Width, W=	15	ft			D/S WW F.L. elev=		**0.0**	ft
9	Side slope, Z=	3	:1			Waterway drop=		**0.0**	ft
10	Safety factor=	1		Typically 1.2		WW length along slope=		**0.0**	ft
11	Rock shape =	Angular							
12	Min. req'd D50=	**3.90**	in			*Spreadsheet formatting key:*			

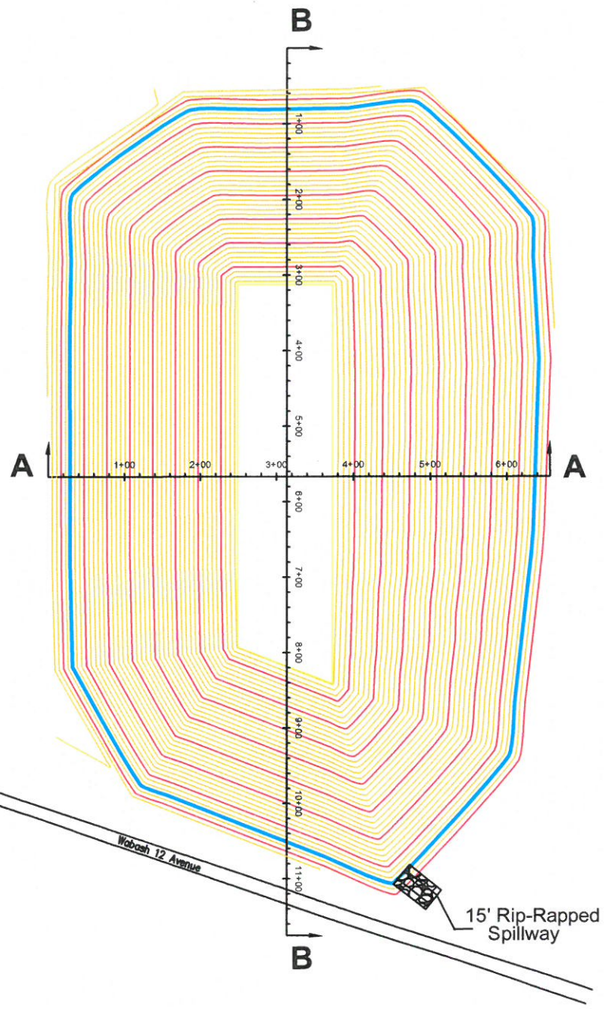
White Station Energy, LLC
250 CROSS POINTE BLVD
EVANSVILLE, INDIANA 47715

Friendsville Mine
SP4 Spillway

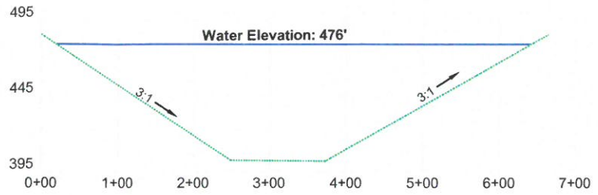
QUADRANGLE: Mt. Carmel
APPLICATION NO.: 458 Permit
COUNTY: Wabash
MINE NAME: FRIENDSVILLE MINE
DATE: 12/27/2019
SCALE: AS NOTED
DRAWN BY: CLH

Slurry Impoundment 4

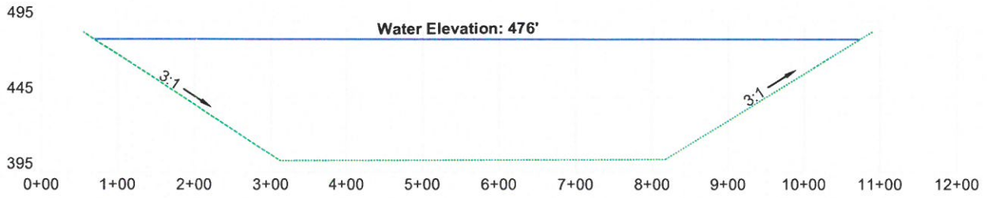
ACRES 15.0
POOL 476.0
BOT. 403.0



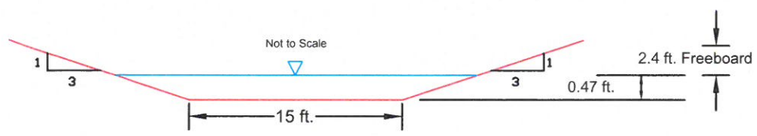
PLAN VIEW



Section A-A
Horz Scale: 1" =200'
Vert Scale: 1" =100'



Section B-B
Horz Scale: 1" = 200'
Vert Scale: 1" =100'



Spillway

Channel Lining: Rip-Rap

Channel Type: Trapezoidal, Equal Side Slopes

Dimensions: Left Side Slope 3:1
Right Side Slope 3:1
Base Dimension: 15.0

Wetted Perimeter: 17.95
Area of Wetted Cross Section: 7.64

Discharge: 44.25 cfs
Depth of Flow: 0.47 feet
Velocity: 5.79 fps

Channel Lining: Rip-Rap
Freeboard: 2.4 feet

PART 9: Reclamation Plan

9.1 Post-Mining Land Use.

9.1.1 Provide a Post-Mining Land Use/Capability Reclamation Map as required by the General Mapping Requirements.

Provide a detailed description of proposed post-mining land uses and capabilities employing land use and capability categories listed in Table 9.1: Post-Mining Land Use Capability. Complete acreage figures for each post-mining land use proposed and designate its capability classification. This information shall be broken down by landowner in addition to the composite land uses and capabilities. In addition, the applicant shall complete Table 9.1 – GRAND TOTAL: Post-Mining Land Use Capability Summary. This table is a compilation of all Post-Mining Land Use Capability tables filled out for each individual land owner.

For IBR applications complete Table 9.1: Post-Mining Land Use Capability for each landowner and update Table 9.1 – GRAND TOTAL Post-Mining Land Use Capability Summary.

*NOTE: For Post-Mining Land Use change IPRs and Significant Revisions see Guidance Document TGD#4 and **complete ONLY** Tables 9.1.1 and 9.1.2*

For surface mines, acreage figures for post-mining land use must differentiate between mined and surface disturbance areas based on the mining line used in Part 2.2.3 of the application. **[1777.11(a)(3)]**

The applicant is proposing the construction of slurry cell #4. In the reclamation of the cell the applicant is requesting to cover the cell with 8' of water with a developed water landuse. The net changes to the landuses will be as follows: -12.9 acres of wetland, +3.4 acres of pasture, +12.5 acres of water, & -3.0 acres of fish & wildlife – herbaceous. Please note that tree bearing landuses will remain the same and will not affect any of the PEP plans contained within the permit. The wetland acreage will be reclaimed per our 404 Permit in an offsite mitigation area. See the Proposed Post Mining Land Use Map.

9.1.2 Where a post-mining land use different from a pre-mining land use is proposed, provide:

a) A discussion explaining the consideration which has been given to making all the proposed surface mining activities consistent with surface owner plans and applicable state and local land use plans and programs. **[1780.23/1784.15]**

Concurrence comments from the landowners can be found in Attachment 9.1.2.

b) A copy of the comments from the owner of the surface concerning the proposed land use of the proposed permit area and from the state or local government agencies which would have to initiate, implement, approve or authorize the proposed uses of the land following reclamation. In the event the surface land owner does not provide comments; the applicant shall provide proof of mailing to the surface owner soliciting comments to show that a good faith effort was made to provide the surface owner with the opportunity to comment. **[1780.23/1784.15]**

9.1.3 Provide a detailed timetable for completion for each major step in the proposed reclamation plan. The time table shall include for: **[1780.18(b)(1)/1784.13(b)(1)]**

9.1.3.1 Surface mine mining areas:

9.1.3.1.1 The timing of the rough grading, root medium, and topsoil during active mining to meet the standards of Section 1816.101(b)(1).

Note: If the plan proposes to reduce the time frames or distance to less than that allowed, it must be stated here and in the reclamation cost estimate section.

Backfilling, grading, soil replacement and revegetation on land disturbed by surface mining activities will be concurrent with mining operations as the mining progresses through the permit area. The timeframes and limits established by 62 Illinois Administrative Code Chapter I, Section 1816.101 and Section 1816.113 will govern the reclamation activities. Should operational plans change or vary, timely requests for waivers will be made to the Department for approval.

9.1.3.1.2 The timing of the planting of initial and permanent vegetation after final grading as it relates to the proposed land use.

A comprehensive vegetation plan, based on requirements developed in the 62 Illinois Administrative Code Chapter I Sections 1816.111 through 1816.117, will be implemented under the direction of Eagle River Coal personnel. Initial revegetation of all reclaimed areas will be planted during the first seeding period for favorable plant growth. Within the first three years of reclamation and not later than the tenth year, revegetation species necessary for bond release will be planted for proof of productivity. The revegetation plan will implement a sequential process of cropping operations designed to best facilitate bond release. Specific sequences of field operations and rotations will vary from season to season as in any farm or forestry operation. Climatic conditions, economic factors, equipment, supplies, and contractor availability and other factors will impact the development of rotations and the sequence of revegetation operations.

9.1.3.2 Surface and underground mines, support areas, including refuse disposal areas:

9.1.3.2.1 The timing of the rough grading, root medium, and topsoil during active mining to meet the standards of Section 1816.101/1817.101

Final grading on support areas shall be completed within 12 months following cessation of active use, unless extended by the Department.

9.1.3.2.2 The timing of the planting of initial and permanent vegetation after final grading as it relates to the proposed land use.

Seeding will take place during the first favorable seeding period after grading has been completed.

9.1.3.2.3 Any other reclamation proposed activities during the mining to minimize reclamation liability and its associated costs.

Not Applicable.

9.2 Backfilling and Grading.

9.2.1 Describe the methods to be used for backfilling and grading the proposed permit area, including soil stabilization and compaction practices in accordance with 62 Ill. Adm. Codes 1816.102/1817.102 through 1816.107/1817.107.

The slurry cell will be monitored frequently to prevent over filling. After disposal activities are complete, the cell will remain as a water impoundment and the slurry material will be covered with 8' (eight feet) of water. The temporary diversion ditches associated with the cell will be removed to provide adequate watershed to meet the land use of water. The design for the impoundment can be found in Attachment 5.4.1 (SP4).

9.2.1.1 Provide appropriate cross-sections to illustrate and define the proposed post-mining configuration of the permit area. These cross-sections shall be referenced on the Post-Mining Land Use/Capability Reclamation Map **[1780.18(b)(3)/1784.13(b)(3)]**

The area will be graded in accordance with the approved permit and approved Land Use / Capability Map.

9.2.2 To achieve the proposed post-mining configuration including cover requirements for refuse disposal areas, the Applicant shall provide soil balancing calculations to ensure an adequate quantity of material is available. These calculations shall include soil shrinkage and swell factors consistent with sound engineering practices as approved by the Department. **[1780.23(b)(1)/1784.15(b)(1)]**

NOTE: This information may be supplied as Attachment 9.2.2.

Not Applicable.

9.2.2.1 Are borrow areas being proposed to provide a sufficient amount of material to achieve the post-mining configuration?

☐ YES ☒ NO

If YES, delineate the locations of the borrow areas on the Post-Mining Land Use/Capability Reclamation Map and complete the appropriate items included in Part 5.0: Drainage Control.

9.2.3 For surface mines, does the proposed surface coal mining and reclamation operation require disposal of excess spoil?

☐ YES ☒ NO ☐ N/A

If YES, provide the following:

9.2.3.1 Each application shall contain descriptions, including appropriate maps and cross-section drawings, of the proposed disposal site and design of the spoil disposal structures according to **62 Ill. Adm. Code 1816.71 through 1816.74**. These plans shall describe the geotechnical investigation, design, construction, operation, maintenance, and removal, if appropriate, of the site and structures. **[1780.35(a)]**

Not Applicable

9.2.3.2 Each application shall contain the results of a geotechnical investigation of the proposed disposal site that include the information outlined in **62 Ill. Adm. Code 1780.35(b)**.

Not Applicable

9.2.3.3 If, under 62 Ill. Adm. Code 1816.71(l), rocktoe buttresses or key-way cuts are required, the application shall include information as outlined in **62 Ill. Adm. 1780.35(c).**

Not Applicable

If NO, will the spoil and other waste materials available from the entire permit area be insufficient to restore the disturbed area to its approximate original contour as addressed in **62 Ill. Adm. Code 1816.104**?

Not Applicable.

9.2.4 Describe the timing in which all grading and the construction and removal or renovation of water and erosion control structures will be complete and the sequence for accomplishing the work in relation to seasonal weather conditions. **[1780.25(a)/1784.16(a)]**

Not Applicable

9.4 Abandonment and Closure of Refuse Disposal Areas.

9.4.1 Describe proposed reclamation for all coal refuse disposal areas in accordance with **62 Ill Adm. Code 1780.18(b)/1784.13(b)**. The proposed reclamation plan shall include the following information:

- Timing of final coverage
- Cross sections of final cover and configuration.
- Type and amount of material proposed to be used for cover, including any coarse refuse used to provide a base over slurry prior to soil cover.
- Construction details of cover and caps, including the proposed soil depths and long-term groundwater protection measures.
- Design details of all proposed downdrain, terraces, benches or any other permanent surface drainage structure.
- Relationship of the refuse disposal area to the post-mining land use.
- Any plans of access roads and other use related facilities.

NOTE: This information shall be provided as Attachment 9.4.1.

See Attachment 9.4.1

9.5 Bond Estimation.

9.5.1 Provide a detailed estimate of the cost of reclamation for the proposed operation required to be covered by a performance bond. Provide calculations and/or drawings, cross sections, etc., to support the reclamation cost estimate. Provide extra calculations for multiple pits or refuse areas. Complete the appropriate Table 9.5 sections. At a minimum, delineate all buildings, reinforced concrete structures and pavement/gravel areas to be reclaimed on the Bond Calculation Map. **[1780.18(b)(2)/1784.13(b)(2); 1800.14]**

The estimate of the cost of reclamation shall be based on:

- Bond Calculation Acreage *(Table 9.5.1.1)*
- Surface Mining Soil Reclamation *(Table 9.5.1.2)*
- Interior Grading (*(Table 9.5.1.3)*
- Boxcut Outslope Grading *(Table 9.5.1.4)*
- Incline/Highwall Reclamation *(Table 9.5.1.5)*

- Refuse Disposal Areas *(Table 9.5.1.6)*
- Incised Slurry Pond or Refuse Reclamation *(Table 9.5.1.7)*
- Support Area Reclamation *(Table 9.5.1.8)*
- Building Reclamation *(Table 9.5.1.9)*
- Reinforced Concrete Structure Reclamation *(Table 9.5.1.10)*
- Pavement/Gravel Area Reclamation *(Table 9.5.1.11)*
- Borehole/Monitoring Well Backfilling *(Table 9.5.1.12)*
- Shaft/Slope Backfilling *(Table 9.5.1.13)*
- Public Road Reclamation *(Table 9.5.1.14)*

NOTE: If incremental bonding is requested, provide a Bond Increment Map as required by the General Mapping Requirements of the Instructions and complete all appropriate Tables of this part.

9.5.2 If applicable, provide the location of buried volatile material storage facilities on the Bond Calculation Map and list the size of each facility. **[1800.14]**

Not Applicable

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	22.10														22.10
	High Cap.				6.30											6.30
	Limited Capability					5.30	12.90					14.80				33.00
	Subtotal	22.10	0.00	0.00	6.30	5.30	12.90	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	61.40
Unaffected (Optional)	Prime	3.80														3.80
	Neg. Det.					5.70										5.70
	High Cap.															0.00
	Limited Capability	3.10														3.10
	Subtotal	6.90	0.00	0.00	0.00	5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.60
Total Area	Prime	25.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.90
	Neg. Det.	0.00	0.00	0.00	0.00	5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.70
	High Cap.	0.00	0.00	0.00	6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.30
	Limited Capability	3.10	0.00	0.00	0.00	5.30	12.90	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	36.10
	Subtotal	29.00	0.00	0.00	6.30	11.00	12.90	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	74.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1B*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	42.30														42.30
	High Cap.	17.90			1.30	29.00										48.20
	Limited Capability				7.10							9.40				16.50
	Subtotal	60.20	0.00	0.00	8.40	29.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	0.00	107.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	42.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.30
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	17.90	0.00	0.00	1.30	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.20
	Limited Capability	0.00	0.00	0.00	7.10	0.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	0.00	16.50
	Subtotal	60.20	0.00	0.00	8.40	29.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	0.00	107.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1C*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	46.20														46.20
	High Cap.				4.00											4.00
	Limited Capability															0.00
	Subtotal	46.20	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.20
Unaffected (Optional)	Prime	2.80														2.80
	Neg. Det.					4.00										4.00
	High Cap.	0.20				0.80										1.00
	Limited Capability															0.00
	Subtotal	3.00	0.00	0.00	0.00	4.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.80
Total Area	Prime	49.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.00
	Neg. Det.	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
	High Cap.	0.20	0.00	0.00	4.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	49.20	0.00	0.00	4.00	4.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1 Sum*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	110.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110.60
	High Cap.	17.90	0.00	0.00	11.60	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.50
	Limited Capability	0.00	0.00	0.00	7.10	5.30	12.90	0.00	0.00	0.00	0.00	24.20	0.00	0.00	0.00	49.50
	Subtotal	128.50	0.00	0.00	18.70	34.30	12.90	0.00	0.00	0.00	0.00	24.20	0.00	0.00	0.00	218.60
Unaffected (Optional)	Prime	6.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.60
	Neg. Det.	0.00	0.00	0.00	0.00	9.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.70
	High Cap.	0.20	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	Limited Capability	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10
	Subtotal	9.90	0.00	0.00	0.00	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.40
Total Area	Prime	117.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	117.20
	Neg. Det.	0.00	0.00	0.00	0.00	9.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.70
	High Cap.	18.10	0.00	0.00	11.60	29.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.50
	Limited Capability	3.10	0.00	0.00	7.10	5.30	12.90	0.00	0.00	0.00	0.00	24.20	0.00	0.00	0.00	52.60
	Subtotal	138.40	0.00	0.00	18.70	44.80	12.90	0.00	0.00	0.00	0.00	24.20	0.00	0.00	0.00	239.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC./KOLB FM2A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	301.90														301.90
	High Cap.	36.90			4.10	11.80										52.80
	Limited Capability					70.60								3.90		74.50
	Subtotal	338.80	0.00	0.00	4.10	82.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90	0.00	429.20
Unaffected (Optional)	Prime															0.00
	Neg. Det.					1.80										1.80
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
Total Area	Prime	301.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	301.90
	Neg. Det.	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
	High Cap.	36.90	0.00	0.00	4.10	11.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.80
	Limited Capability	0.00	0.00	0.00	0.00	70.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90	0.00	74.50
	Subtotal	338.80	0.00	0.00	4.10	84.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90	0.00	431.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC./KOLB FM2B*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime															0.00
	High Cap.	26.60				19.00										45.60
	Limited Capability													0.40		0.40
	Subtotal	26.60	0.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	46.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	26.60	0.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.60
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.40
	Subtotal	26.60	0.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	46.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC./KOLB FM2 Sum*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	301.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	301.90
	High Cap.	63.50	0.00	0.00	4.10	30.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.40
	Limited Capability	0.00	0.00	0.00	0.00	70.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30	0.00	74.90
	Subtotal	365.40	0.00	0.00	4.10	101.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30	0.00	475.20
Unaffected (Optional)	Prime	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Neg. Det.	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
	High Cap.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
Total Area	Prime	301.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	301.90
	Neg. Det.	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
	High Cap.	63.50	0.00	0.00	4.10	30.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.40
	Limited Capability	0.00	0.00	0.00	0.00	70.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30	0.00	74.90
	Subtotal	365.40	0.00	0.00	4.10	103.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30	0.00	477.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *Barker Estate FM3A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	60.10														60.10
	High Cap.				2.50	103.00										105.50
	Limited Capability											7.40				7.40
	Subtotal	60.10	0.00	0.00	2.50	103.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	173.00
Unaffected (Optional)	Prime	8.80														8.80
	Neg. Det.					29.00										29.00
	High Cap.															0.00
	Limited Capability	2.10				9.10										11.20
	Subtotal	10.90	0.00	0.00	0.00	38.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.00
Total Area	Prime	68.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.90
	Neg. Det.	0.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.00
	High Cap.	0.00	0.00	0.00	2.50	103.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105.50
	Limited Capability	2.10	0.00	0.00	0.00	9.10	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	18.60
	Subtotal	71.00	0.00	0.00	2.50	141.10	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	222.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *Sharon Majors FM4A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	43.30														43.30
	High Cap.					13.20										13.20
	Limited Capability								3.10					1.40		4.50
	Subtotal	43.30	0.00	0.00	0.00	13.20	0.00	0.00	3.10	0.00	0.00	0.00	0.00	1.40	0.00	61.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	43.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.30
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	0.00	0.00	0.00	0.00	13.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.20
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.00	0.00	0.00	0.00	1.40	0.00	4.50
	Subtotal	43.30	0.00	0.00	0.00	13.20	0.00	0.00	3.10	0.00	0.00	0.00	0.00	1.40	0.00	61.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *Homer Majors FM5A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	46.30														46.30
	High Cap.					17.70										17.70
	Limited Capability								2.00							2.00
	Subtotal	46.30	0.00	0.00	0.00	17.70	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	66.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	46.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.30
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	0.00	0.00	0.00	0.00	17.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.70
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
	Subtotal	46.30	0.00	0.00	0.00	17.70	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	66.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - APPROVED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: ***GRAND TOTAL***

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	562.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	562.20
	High Cap.	81.40	0.00	0.00	18.20	193.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	293.30
	Limited Capability	0.00	0.00	0.00	7.10	75.90	12.90	0.00	5.10	0.00	0.00	31.60	0.00	5.70	0.00	138.30
	Subtotal	643.60	0.00	0.00	25.30	269.60	12.90	0.00	5.10	0.00	0.00	31.60	0.00	5.70	0.00	993.80
Unaffected (Optional)	Prime	15.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.40
	Neg. Det.	0.00	0.00	0.00	0.00	40.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50
	High Cap.	0.20	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
	Limited Capability	5.20	0.00	0.00	0.00	9.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.30
	Subtotal	20.80	0.00	0.00	0.00	50.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.20
Total Area	Prime	577.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	577.60
	Neg. Det.	0.00	0.00	0.00	0.00	40.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50
	High Cap.	81.60	0.00	0.00	18.20	194.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	294.30
	Limited Capability	5.20	0.00	0.00	7.10	85.00	12.90	0.00	5.10	0.00	0.00	31.60	0.00	5.70	0.00	152.60
	Subtotal	664.40	0.00	0.00	25.30	320.00	12.90	0.00	5.10	0.00	0.00	31.60	0.00	5.70	0.00	1065.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	38.00														38.00
	High Cap.				3.30											3.30
	Limited Capability					5.30						14.80				20.10
	Subtotal	38.00	0.00	0.00	3.30	5.30	0.00	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	61.40
Unaffected (Optional)	Prime	3.80														3.80
	Neg. Det.					5.70										5.70
	High Cap.															0.00
	Limited Capability	3.10														3.10
	Subtotal	6.90	0.00	0.00	0.00	5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.60
Total Area	Prime	41.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.80
	Neg. Det.	0.00	0.00	0.00	0.00	5.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.70
	High Cap.	0.00	0.00	0.00	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.30
	Limited Capability	3.10	0.00	0.00	0.00	5.30	0.00	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	23.20
	Subtotal	44.90	0.00	0.00	3.30	11.00	0.00	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	74.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1B*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	42.30														42.30
	High Cap.	17.90			1.30	29.00										48.20
	Limited Capability				7.10							9.40				16.50
	Subtotal	60.20	0.00	0.00	8.40	29.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	0.00	107.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	42.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.30
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	17.90	0.00	0.00	1.30	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.20
	Limited Capability	0.00	0.00	0.00	7.10	0.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	0.00	16.50
	Subtotal	60.20	0.00	0.00	8.40	29.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	0.00	107.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1C*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	37.00														37.00
	High Cap.		1.00		4.00											5.00
	Limited Capability		0.40									7.80				8.20
	Subtotal	37.00	1.40	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	7.80	0.00	0.00	0.00	50.20
Unaffected (Optional)	Prime	2.10														2.10
	Neg. Det.					4.00										4.00
	High Cap.	0.20	0.70			0.80										1.70
	Limited Capability															0.00
	Subtotal	2.30	0.70	0.00	0.00	4.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.80
Total Area	Prime	39.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.10
	Neg. Det.	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
	High Cap.	0.20	1.70	0.00	4.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.70
	Limited Capability	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.80	0.00	0.00	0.00	8.20
	Subtotal	39.30	2.10	0.00	4.00	4.80	0.00	0.00	0.00	0.00	0.00	7.80	0.00	0.00	0.00	58.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC. FM1 Sum*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE													Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	117.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	117.30
	High Cap.	17.90	1.00	0.00	8.60	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.50
	Limited Capability	0.00	0.40	0.00	7.10	5.30	0.00	0.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00	44.80
	Subtotal	135.20	1.40	0.00	15.70	34.30	0.00	0.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00	218.60
Unaffected (Optional)	Prime	5.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90
	Neg. Det.	0.00	0.00	0.00	0.00	9.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.70
	High Cap.	0.20	0.70	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70
	Limited Capability	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10
	Subtotal	9.20	0.70	0.00	0.00	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.40
Total Area	Prime	123.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	123.20
	Neg. Det.	0.00	0.00	0.00	0.00	9.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.70
	High Cap.	18.10	1.70	0.00	8.60	29.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.20
	Limited Capability	3.10	0.40	0.00	7.10	5.30	0.00	0.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00	47.90
	Subtotal	144.40	2.10	0.00	15.70	44.80	0.00	0.00	0.00	0.00	0.00	32.00	0.00	0.00	0.00	239.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC./KOLB FM2A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	295.90														295.90
	High Cap.	36.90	1.30		4.10	11.80										54.10
	Limited Capability					70.60						4.70		3.90		79.20
	Subtotal	332.80	1.30	0.00	4.10	82.40	0.00	0.00	0.00	0.00	0.00	4.70	0.00	3.90	0.00	429.20
Unaffected (Optional)	Prime															0.00
	Neg. Det.					1.80										1.80
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
Total Area	Prime	295.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	295.90
	Neg. Det.	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
	High Cap.	36.90	1.30	0.00	4.10	11.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.10
	Limited Capability	0.00	0.00	0.00	0.00	70.60	0.00	0.00	0.00	0.00	0.00	4.70	0.00	3.90	0.00	79.20
	Subtotal	332.80	1.30	0.00	4.10	84.20	0.00	0.00	0.00	0.00	0.00	4.70	0.00	3.90	0.00	431.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC./KOLB FM2B*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime															0.00
	High Cap.	26.60				19.00										45.60
	Limited Capability													0.40		0.40
	Subtotal	26.60	0.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	46.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	26.60	0.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.60
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.40
	Subtotal	26.60	0.00	0.00	0.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	46.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *MAK Energy, LLC./KOLB FM2 Sum*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	295.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	295.90
	High Cap.	63.50	1.30	0.00	4.10	30.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.70
	Limited Capability	0.00	0.00	0.00	0.00	70.60	0.00	0.00	0.00	0.00	0.00	4.70	0.00	4.30	0.00	79.60
	Subtotal	359.40	1.30	0.00	4.10	101.40	0.00	0.00	0.00	0.00	0.00	4.70	0.00	4.30	0.00	475.20
Unaffected (Optional)	Prime	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Neg. Det.	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
	High Cap.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
Total Area	Prime	295.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	295.90
	Neg. Det.	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
	High Cap.	63.50	1.30	0.00	4.10	30.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.70
	Limited Capability	0.00	0.00	0.00	0.00	70.60	0.00	0.00	0.00	0.00	0.00	4.70	0.00	4.30	0.00	79.60
	Subtotal	359.40	1.30	0.00	4.10	103.20	0.00	0.00	0.00	0.00	0.00	4.70	0.00	4.30	0.00	477.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *Barker Estate FM3A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	60.10														60.10
	High Cap.				2.50	103.00										105.50
	Limited Capability											7.40				7.40
	Subtotal	60.10	0.00	0.00	2.50	103.00	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	173.00
Unaffected (Optional)	Prime	8.80														8.80
	Neg. Det.					29.00										29.00
	High Cap.															0.00
	Limited Capability	2.10				9.10										11.20
	Subtotal	10.90	0.00	0.00	0.00	38.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.00
Total Area	Prime	68.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.90
	Neg. Det.	0.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.00
	High Cap.	0.00	0.00	0.00	2.50	103.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105.50
	Limited Capability	2.10	0.00	0.00	0.00	9.10	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	18.60
	Subtotal	71.00	0.00	0.00	2.50	141.10	0.00	0.00	0.00	0.00	0.00	7.40	0.00	0.00	0.00	222.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *Sharon Majors FM4A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	43.30														43.30
	High Cap.					13.20										13.20
	Limited Capability								3.10					1.40		4.50
	Subtotal	43.30	0.00	0.00	0.00	13.20	0.00	0.00	3.10	0.00	0.00	0.00	0.00	1.40	0.00	61.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	43.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.30
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	0.00	0.00	0.00	0.00	13.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.20
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.00	0.00	0.00	0.00	1.40	0.00	4.50
	Subtotal	43.30	0.00	0.00	0.00	13.20	0.00	0.00	3.10	0.00	0.00	0.00	0.00	1.40	0.00	61.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: *Homer Majors FM5A*

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	46.30														46.30
	High Cap.					17.70										17.70
	Limited Capability								2.00							2.00
	Subtotal	46.30	0.00	0.00	0.00	17.70	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	66.00
Unaffected (Optional)	Prime															0.00
	Neg. Det.															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	46.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.30
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	High Cap.	0.00	0.00	0.00	0.00	17.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.70
	Limited Capability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
	Subtotal	46.30	0.00	0.00	0.00	17.70	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	66.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Table 9.1 - PROPOSED
Post-Mining Land Use Capability

Revised 1/9/2019

Land Owner: ***GRAND TOTAL***

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	562.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	562.90
	High Cap.	81.40	2.30	0.00	15.20	193.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	292.60
	Limited Capability	0.00	0.40	0.00	7.10	75.90	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	138.30
	Subtotal	644.30	2.70	0.00	22.30	269.60	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	993.80
Unaffected (Optional)	Prime	14.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.70
	Neg. Det.	0.00	0.00	0.00	0.00	40.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50
	High Cap.	0.20	0.70	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70
	Limited Capability	5.20	0.00	0.00	0.00	9.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.30
	Subtotal	20.10	0.70	0.00	0.00	50.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.20
Total Area	Prime	577.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	577.60
	Neg. Det.	0.00	0.00	0.00	0.00	40.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50
	High Cap.	81.60	3.00	0.00	15.20	194.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	294.30
	Limited Capability	5.20	0.40	0.00	7.10	85.00	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	152.60
	Subtotal	664.40	3.40	0.00	22.30	320.00	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	1065.00

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

For PMLU Change IPRs and Significant Revisions Use Tables 9.1.1 and 9.1.2

Table 9.1.1
Currently Approved Post-Mining Land Use Capability Summary

Revised 1/9/2019

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	*Wildlife	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	562.20															562.20
	High Cap.	81.40				18.20	193.70										293.30
	Limited Capability					7.10	75.90	12.90		5.10			31.60		5.70		138.30
	Subtotal	643.60	0.00	0.00	0.00	25.30	269.60	12.90	0.00	5.10	0.00	0.00	31.60	0.00	5.70	0.00	993.80
Unaffected (Optional)	Prime	15.40															15.40
	Neg. Det.						40.50										40.50
	High Cap.	0.20					0.80										1.00
	Limited Capability	5.20					9.10										14.30
	Subtotal	20.80	0.00	0.00	0.00	0.00	50.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.20
Support	Prime																0.00
	High Cap.																0.00
	Limited Capability																0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	577.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	577.60
	Neg. Det.	0.00	0.00	0.00	0.00	0.00	40.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50
	High Cap.	81.60	0.00	0.00	0.00	18.20	194.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	294.30
	Limited Capability	5.20	0.00	0.00	0.00	7.10	85.00	12.90	0.00	5.10	0.00	0.00	31.60	0.00	5.70	0.00	152.60
	Subtotal	664.40	0.00	0.00	0.00	25.30	320.00	12.90	0.00	5.10	0.00	0.00	31.60	0.00	5.70	0.00	1065.00

*** "Wildlife" post-mining land use is only applicable to older permits that were approved prior to Operator Memorandum No. 2015-01**

Table 9.1.2
Proposed Post-Mining Land Use Capability Summary

DISTURB CATEGORY	LAND CAPABILITY	POST-MINE LAND USE ACREAGE														Subtotal
		Cropland	Pasture	Forest	Wildlife -Herb	Wildlife - Woody	Wildlife - Wetland	Wildlife - Water	Residential	Industrial/ Commercial	Undeveloped	Developed Water Resources	Recreation	Public Roads	Cemetery	
Mining Area	Prime	562.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	562.90
	High Cap.	81.40	2.30	0.00	15.20	193.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	292.60
	Limited Capability	0.00	0.40	0.00	7.10	75.90	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	138.30
	Subtotal	644.30	2.70	0.00	22.30	269.60	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	993.80
Unaffected (Optional)	Prime	14.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.70
	Neg. Det.	0.00	0.00	0.00	0.00	40.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50
	High Cap.	0.20	0.70	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70
	Limited Capability	5.20	0.00	0.00	0.00	9.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.30
	Subtotal	20.10	0.70	0.00	0.00	50.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.20
Support	Prime															0.00
	High Cap.															0.00
	Limited Capability															0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area	Prime	577.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	577.60
	Neg. Det.	0.00	0.00	0.00	0.00	40.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50
	High Cap.	81.60	3.00	0.00	15.20	194.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	294.30
	Limited Capability	5.20	0.40	0.00	7.10	85.00	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	152.60
	Subtotal	664.40	3.40	0.00	22.30	320.00	0.00	0.00	5.10	0.00	0.00	44.10	0.00	5.70	0.00	1065.00

Acting Supervisor
Illinois Department of Natural resources
Land Reclamation Division – OMM
One Natural resources Way
Springfield, IL 62702-1277

Dear Sir / Madam,

As a landowner within Vigo Coal Operating Co., LLC.'s 458 Permit for the Friendsville Mine. This letter acknowledges that I (we) have reviewed Vigo's proposed post mine land use as it related to my (our) property. I (We) have no objection to the proposed net changes as outlined below:

-12.9 acres of Wildlife - Wetland
+3.4 acres of Pasture
+12.5 acres of Developed Water
-3.0 acres of Wildlife - Herbaceous

Sincerely,
MAK Energy, LLC.

Manager

Date: 4/6/2020

SCML 9 Refuse Cover Variance Request Form

SCML-9 forms shall be completed and submitted via email directly to the Refuse Committee Chairperson (Kristi Dodson kristi.dodson2@illinois.gov), **prior** to inclusion of a cover variance proposal as a portion of a Significant Revision or Insignificant Permit Revision application. Any maps, plans, data, or related documentation may be submitted as attachments corresponding to SCML-9 form part and question. The Department will advise the operator or permittee of decision to deny the variance proposal, or approve the proposal for further evaluation, via letter. **An approval letter for further evaluation of the proposal shall be included in Part 9.4.1 of the application for a permit revision along with the completed SCML-9 form**.

Part 1. General Information

Permittee:	**Vigo Coal Operating Co., LLC.**
Mine Name:	**Friendsville Mine**
Permit No(s).:	**458**
No. of acres involved in request:	**10.8**

Part 2. Refuse Disposal Area Information (62 Ill. Adm. Code 1780.18(b)/1784.13(b) and 1816/1817.83(c)(4))

1. Provide information regarding the specific refuse disposal area (RDA) involved in the cover variance request including structure name and/or general location, nature and age of the RDA (gob pile, incised slurry impoundment, above grade slurry impoundment, etc.), and current disposition of the structure.

The applicant is requesting a cover variance for proposed Slurry Cell #4. This cell is yet to be constructed and is proposed as an incised structure.

2. Provide information regarding the quality of the refuse (coarse refuse and/or slurry, as applicable) including potential acidity (PA), net neutralization potential (NNP), and exchangeable sodium (Na) concentration. Provide specifics of the sampling that occurred to obtain the information (pipe discharge point samples, grid samples, and depth of samples, etc.).

The applicant has sampled currently approved Slurry Cell #3 within the 330 Permit. Two samples were collected and will be representative of future slurry quality. The results will be forwarded to the LRD upon receipt as Attachment 9.4.1

Part 3. General Cover Variance Proposal Information (62 Ill. Adm. Code 1816/1817.81, 1816/1817.83, 1816/1817.84)

1. Provide a general description of the nature of the cover variance request including depths of subsoil, topsoil, or best available materials and a justification that the proposed variance is the best available option for the relevant RDA.

The applicant is requesting approval to cover the proposed slurry cell with 8' of water. In accordance to Vigo's future mining plans along with approval from the landowner to leave a permanent impoundment, this is the best available option for cover. Economic factors were also taken into consideration.

2. Provide an explanation and/or demonstration that the proposed variance will be as preventative of, or more preventative of acid mine drainage problems than 4 ft. of the best available, nontoxic, and noncombustible material.

The operator will maintain a minimum of 8' water cover over the slurry disposal area to prevent oxidation of pyritic material. Additionally, the volume of water that is proposed in the final reclaimed configuration versus the amount of coal refuse proposed to be placed in the disposal area is a ratio that should preclude water quality from becoming an issue.

3. Based on the quality information of the refuse, discuss the proposed rate of neutralization material to be used as part of the cover variance request. Include calcium carbonate equivalent (CCE) analysis on a dry weight basis and proposed application rates. For guidance regarding required information, see Operator Memorandum of No. 2020-02.

The applicant does not propose to neutralize the slurry with amendments, 8' of water will be utilized to prevent oxidation of the slurry material.

4. Provide information regarding a proposed sampling plan to verify compaction of a coarse refuse cap and/or compacted clay liner, as applicable. If one or the other, or both, of compaction situations are not applicable, provide an explanation.

Not Applicable. The applicant is requesting approval to cover the proposed slurry cell with 8' of water.

5. Provide information regarding the proposed side slopes of the RDA, if applicable, and discuss whether or not the proposed side slopes are different than that approved in the original permit.

The side slopes to the proposed incised slurry cell will be 3:1 below slurry and final water elevation and 4:1 or less above final water elevation.

6. Provide information that justifies that the total depth of soil proposed in the cover variance request (including total soil cover placed on top of a geosynthetic cap) is of sufficient quantity and quality to support vegetative growth and to support the approved post-mining land use.

Not Applicable

7. Provide a detailed plan for cover/stabilization of the down drains located on the RDA.

Not Applicable

Part 4. Hydrologic Specific Information (62 Ill. Adm. Code 1780.21(f)/1784.14(f)

1. For proposals of less than 4ft. of soil cover, provide justification and data that groundwater will be protected by providing the following information:
    a. An evaluation of the current/existing groundwater quality including a description of groundwater flow direction.
    b. Provide this information for each aquifer that is monitored or has the potential to be impacted.

The potential aquifers in the general area include thin and discontinuous unconsolidated sand and gravel deposits with poor probabilities of ground water occurrence and Pennsylvanian Age water bearing sandstones, limestone and coals at depths in excess of 200 feet. No major aquifers exist within the permit area. However, the major aquifers listed are associated with the Wabash river valley located to the east and generally capable of supplying sufficient water production for small commercial, industrial, municipal or irrigation purposes. The minor consolidated bedrock aquifers in the vicinity of the permit area could potentially only produce small yields for individual, domestic supplies. Yields from wells in these units are generally 10 to 20 gallons per minute with several less than 10 gallons per minute. The low permeability of the Pennsylvanian System rocks causes the water in the deeper formations to be highly mineralized. Therefore, water quality in some of the deeper bedrock aquifers is generally unsatisfactory without expensive treatment.

Groundwater flows in a south and southeasterly direction in this portion of the permit. There is a high ridge that extends from northeast to southwest within the permit area and functions as a ground watershed breakline for flow direction. Please see Hydrogeological Map – Map 5.

2. For proposals of less than 4ft. of soil cover where a bottom/base liner (geosynthetic or compacted clay) is in place, a demonstration must be made that the infiltration rate into the RDA is less than the exfiltration rate through the base/bottom liner by providing the following information:
    a. An evaluation of the current/existing groundwater quality including a description of groundwater flow direction.
    b. Provide this information for each aquifer that is monitored or has the potential to be impacted.
    c. A model to show the impact of less than 4ft. of cover, or to show the equivalent geosynthetic cover will prevent infiltration (e.g. Hydrologic Evaluation of Landfill Performance (HELP)).

Not Applicable

3. Provide a demonstration that groundwater wells are adequately placed to determine all of the above information or provide a plan to install new wells or to conduct a hydrogeologic investigation.

Since there were no monitoring wells installed along the southern portion of the proposed permit area, two wells (GW-36 & GW-37 are proposed to monitor the slurry cell. GW-36 will monitor

the unconsolidated material between the slurry cell and the adjacent Stoneberger Well. GW-37 will monitor the entire backfilled area for the total depth of the well. GW-7 will ensure the clayliner is functioning as designed and any potential groundwater contamination.

Part 5. Slurry Wetland/Direct Slurry Revegetation Proposal Information (62 Ill. Adm. Code 1816/1817.117)

1. Provide a longitudinal cross-section of the structure to demonstrate that the structure is fully incised. Depict the expected water level and discuss whether or not the water level is expected to fluctuate during the year.

Not Applicable

2. Provide a demonstration that the area will be suitable for a wetland post-mining land use as defined at 62 Ill. Adm. Code 1701.5 Appendix A.

Not Applicable

3. Provide a discussion that the bond release criteria for wetlands found at Section 1816.116/1817.117(a)(5) will be met. If amendments are proposed to facilitate direct revegetation of slurry, ensure Part 3 Question 4 is addressed.

Not Applicable

Part 6. Geosynthetic Cover Liner Information (62 Ill. Adm. Code 1816/1817.83(c)(4))

1. Provide manufacturer product specifications of the proposed geosynthetic cover liner and the depth of subsoil, topsoil, or best available material to be placed on top of the cover liner.

Not Applicable

2. Provide information describing how the integrity of a geosynthetic cover liner will be maintained when covering with earthen materials.

Not Applicable

3. Provide information demonstrating that soil cover placed on top of a geosynthetic cover liner will not slough or slide off of the out slopes of the RDA. Discuss how the soil cover will be adequate to prevent erosion and future exposure of the geosynthetic cover liner to UV light.

Not Applicable

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Table 9.5.1.1
Bond Calculation Acreages

Revised 1/9/2019

Land Use/Operation	Acres	Cost
Prime Farmland (surface mined)	0.00	**$0.00**
High Capability (surface mined)	0.00	**$0.00**
Non-Cropland Capability (surface mined)	0.00	**$0.00**
Incline/Highwall Slopes (surface mined)	0.00	**$0.00**
Boxcut Spoil Area (surface mined)	0.00	**$0.00**
Water	0.00	**$0.00**
Support Facilities	0.00	**$0.00**
Refuse Disposal Area* (above grade)	0.00	**$0.00**
Refuse Disposal Area (below grade)	10.80	**$0.00**
Placeland/Unaffected	0.00	**$0.00**
Roads (to remain)	0.00	**$0.00**
Total (should equal Permitted acres)	10.80	**$0.00**

*Includes slurry inside refuse area

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Sluury Cell #4 will be incised and covered with 8' of water

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Table 9.5.1.7
Incised Slurry Pond or Refuse Reclamation

Revised 1/9/2019

Pond ID:	Slurry Cell #4	Size:	10.8	acres	**COST**
Estimated thickness of waste surface grading:				feet	$0.00 /yd
Lime application:				tons/acre	$0.00
Subsoil:	Thickness:			inches	
	Length of haul:			feet	
	Method of replacement:	☐ Scraper			$0.00 /yd
		☐ Truck			
		☐ Dozer			
Topsoil:	Thickness:			inches	
	Length of haul:			feet	
	Method of replacement:	☐ Scraper			$0.00 /yd
		☐ Truck			
		☐ Dozer			
				TOTAL:	**$0.00**

Pond ID:		Size:		acres	**COST**
Estimated thickness of waste surface grading:				feet	$0.00 /yd
Lime application:				tons/acre	$0.00
Subsoil:	Thickness:			inches	
	Length of haul:			feet	
	Method of replacement:	☐ Scraper			$0.00 /yd
		☐ Truck			
		☐ Dozer			
Topsoil:	Thickness:			inches	
	Length of haul:			feet	
	Method of replacement:	☐ Scraper			$0.00 /yd
		☐ Truck			
		☐ Dozer			
				TOTAL:	**$0.00**

NOTE: All acreage numbers must be reported to the hundreth of an acre (x.xx)

Slurry Cell #4 will be incised and covered with 8' of water

Table 9.5.1.12
Borehole/Monitoring Well Backfilling

Quantity	Name / ID	Type	Radius (inches)	Depth (feet)
1	GW36	Monitoring Well	4"	20'
1	GW37	Monitoring Well	4"	82'

TOTAL COST: **$0.00**