Module 9: Operations Map

[§77.454]

Provide a map or plan that includes the permit area and the area within 1,000 feet of the permit area. The map or plan shall be clear, accurate, easily read and on a scale of no smaller than 1 inch = 400 feet. Maps on the scale of 1 inch = 200 feet for permit areas of 100 acres or less and 1 inch = 400 feet for permit areas larger than 100 acres are preferred. Use the same scale as used for Exhibits 6.2 and 18. Identify the map or plan as Exhibit 9 Operations Map. Each map or plan must bear the seal or facsimile imprint of a registered professional engineer; or the seal or facsimile imprint of a registered professional land surveyor. Show all the following information within the permit area and for a distance of 1000 feet from the permit area, unless specified otherwise. Include an appropriate legend on the map. Indicate which items are present by placing a check mark in the box before the item. Please provide the permit number (if is has been assigned) or a space for it in the title block. Please also include the acreage of the total permit area.

- ☒ a) topographic contours (contour intervals of 20 feet or less);
- ☒ b) proposed surface mine permit area, and initial bond increment;
- ☒ c) surface water bodies such as streams, lakes, ponds, springs, wetlands, mine discharges and constructed or natural drains (include restricted or variance areas, and names of streams and lakes/use a unique label for each unnamed tributary);
- ☒ d) property lines (key ownership to Module 5);
- ☒ e) buildings (include current use and restricted or variance areas);
- ☒ f) man-made features such as public highways, railroads, utility lines including right-of-ways or easements, and other man-made features (include the name of the highway, railroad and utility and the restricted or variance areas);
- ☐ g) oil and gas wells in and within 125 feet of the permit area (include restricted or variance areas);
- ☐ h) public or private cemeteries or Indian burial grounds (include restricted areas);
- ☐ i) existing or previously surface-mined areas, preact highwalls, existing structures and existing areas of refuse, spoil, waste, and processing waste disposal;
- ☐ j) areal extent of active and abandoned underground mines if mining above or through;
- ☐ k) solid waste disposal areas;
- ☒ l) final working face limit for mineral to be mined (i.e., maximum lateral extent of mineral extraction prior to final postmining slope development);
- ☒ m) phases of mining (indicate initial phase, sequence, and direction of mining);
- ☒ n) water treatment facilities;
- ☒ o) surface water diversions;
- ☒ p) erosion and sedimentation control facilities, including location and size of existing structures, road culverts and drainage ways;
- ☒ q) dams and impoundments;
- ☒ r) berms and spoil storage areas;
- ☒ s) topsoil storage areas;
- ☒ t) haul roads (outside of area being mined);
- ☐ u) refuse disposal areas (indicate any material in the refuse which may be acid forming);
- ☒ v) processing facilities and stockpile areas;
- ☒ w) air pollution control facilities;
- ☐ x) explosives storage areas;
- ☐ y) formation contacts and coal croplines (where applicable);
- ☒ z) test hole locations (key to 7.1 b data).
- ☐ aa) incidental coal extraction areas

Module 10: Operational Information
[§§77.452/77.456/77.563/77.564]

10.1 Equipment and Operation Plan

For each phase of mining, identify the type and method of mining; engineering techniques; major equipment to be used; starting point; and the anticipated sequence in which the phases are to be mined.

CONSOLIDATED MATERIAL (HARD ROCK):
Mining at the site will be in three (3) phases with multiple bond increments.

Mining will be conducted by modified block cut. The mineral will be extracted in blocks in accordance with highwall heights and bench widths; 50' maximum height and a 25' minimum working bench. Once mining progresses to the mining limits, a 71' minimum final bench with a 50' maximum highwall is required to achieve site reclamation. Bench width can vary based upon final highwall heights provided a reclamation slope of 35 degrees can be achieved. Grading of stockpiled material along the perimeter of the mining areas and the bonded stockpile material will be utilized to help achieve final reclamation slopes. At the completion of this grading, soils will be replaced, followed by seeding and mulching.

Mining will be completed at multiple benches as mining progresses. The benches will be large enough to facilitate the extraction and processing of materials if needed. Multiple benches will provide the operator flexibilty should mineral quality vary.

UNCONSOLIDATED MATERIAL (SAND & GRAVEL):
Mining at the site will be completed in multiple phases by general excavation above and below the water table. No dewatering of the mining area is proposed. Mining will be conducted by general area removal. The mineral will extracted in lifts in accordance with highwall height (25' typ), bench width (25' typ), and slope (1.5:1 typ) recommendations.

The following benching sequences will be used during mining: maximum heights of 25' for highwalls and 25' minimum width for benching will be used. All mining along the mining limits will be conducted in a manner to reduce the need for additional material handling for final reclamation. In areas where final mining slopes are found to exceed 35°, excess material will be utilized to help achieve final reclamation slopes elsewhere in the permit area. At the completion of this grading, soils will be replaced followed by seeding and mulching. A safety bench will be provided at final water surface elevation of the impoundment; refer to detail on Exhibit 10.2. The configuration of the safety bench will account for potential water level fluctuations.

A majority of the sand and gravel mineral extraction area is within the 100 year flood plain of the Chemung River and Tutelow Creek. The topography of the site and proposed mining plan will not prevent floodwaters from entering the mining operation. The proposed perimeter berms shown on the exhibit maps are utilized for material storage and to restrict access to the site. The perimeter berms are not intended to prevent floodwaters from entering the site. In the event of a weather forecast for significant precipitation or flood warnings, the operator will relocate equipment to high ground to minimize floodwater impacts to the site. Potential impacts of the flooding will be operation downtime and cleanup of sediment and debris from floodwaters.

If a flood occurs, floodwaters will inundate the site and then recede slowly as the adjacent waterways return to normal flow conditions. Floodwater in the pit will limit mining operations; the operator will proceed with caution as conditions return to normal. Floodwaters in the support area and processing area will recede as the adjacent waterways return to normal flow conditions. Floodwaters in Basin 1 will exit via the emergency spillway and eventually the principal spillway as the adjacent waterways return to normal flow conditions.

BONDING:
The operation will be bonded prior to mining. The topsoil will be stripped ahead of mining and stored along the perimeter of the mining area. These soil storage areas will be in place to ensure that the site can be revegetated for the proposed post mining land uses. The topsoil berms and overburden berms will also act as a containment system to keep any sediment laden runoff from leaving the site. Once vegetation has become established on the soil storage berms, the operation will be virtually self-contained so that under normal climatic conditions all runoff from the site will be directed to sedimentation basins or pit sumps.

The operator may vary the phase sequence and bonded area based upon subsurface conditions encountered during mining and market demand. The characteristics of the mined material will guide development of each phase of mining.

Hard Rock Phase 1 (Initial Bond Increment):

The initial bond increment will develop the mine site infrastructure and Hard Rock Phase 1.

Support Areas:

1. **Install support area sumps at the perimeter of the bonded area as indicated on Exhibit 9.**
2. **Install E&S controls and temporary crossing of Tutelow Creek to begin construction of the Tutelow Creek Bridge. Refer to Module 14 and Exhibit 14 for additional details.**
3. **Install E&S controls for the UNT 1 Tutelow Creek pipe crossing. Refer to Module 14 and Exhibit 14 for additional details.**
4. **Install E&S controls downslope of Basin 2.**
5. **Clear and grub access road between support area and Hard Rock mining area. Trees shall harvested and stumps and brush shall be chipped or stockpiled in the bonded overburden pile area.**
6. **Install office and storage trailers. Scales may be installed at any time during this sequence.**
7. **Strip topsoil and stockpile.**
8. **Begin construction of Tutelow Creek Bridge. Refer to Module 14 and Exhibit 14 for additional details.**
9. **Begin construction of Basin 2. Utilize excavated material from Basin 2 area to construct access road base from Hard Rock mining area to the support area. Continue constructing the access road to the north entrance utilizing suitable material excavated from the Hard Rock mining area. Install Basin 2 emergency spillway, riprap protection, outlet pipe and seed and mulch all disturbed areas.**
10. **Once bridge complete, backfill abutments and finalize access road grade. Install perimeter E&S controls and Haul Road E&S Sediment Trap (see detail on Exhibit 10.1). Remove temporary crossing and revegetate disturbed areas.**
11. **Continue with the installation of the access road from the bridge north to Meadowlark Drive. Install Haul Road E&S Sediment Traps. At the northern end of the access road at the intersection of the paved drivwey, install a rock construction entrance. Refer to detail on Exhibit 10.2.**
12. **Complete all requirements of the Athens Township approval (subject to change based upon receipt of final Township approval):**
    a. **Evergreen screening along homes on Meadowlark Drive**
    b. **Place conspicuous signage at regular intervals, and fencing where appropriate along the property line adjacent to Round Top Park, sufficient to ensure that park visitors are aware of the mining activity.**
13. **Stabilize support area for processing and stockpiling material.**

Hard Rock Phase 1 Mining Area:

1. **Clear and grub area. Trees shall harvested and stumps and brush shall be chipped or stockpiled in the bonded overburden pile area.**
2. **Install perimeter controls (super silt fence) as noted on the Exhibit maps.**
3. **Strip and stockpile topsoil and overburden. Topsoil shall be utilzied for perimter containment berms around the mining operation. Due to the site topography, berm size will be limited by site conditions. Efforts will be made to construct a berm to prevent unauthorized entry into the mining area. Safety is the primary goal of the perimeter berms; storage of excess material will be provided by the bonded Overburden Storage Pile.**
4. **Install diversion ditches upslope of the perimeter berms to divert runoff away from the mining area.**
5. **All berms will be seeded and mulched to develop vegetative cover to stabilize the berm. Overburden will be placed in the Overburden Storage Pile and utilized for construction of the access road to Meadowlark Drive.**
6. **The initial mineral extract will occur at or near the final pit floor elevation and work into the hillside. Exploration efforts indicate there is approximatly 50-75' of material that can be removed by general excavation before consolidated rock is encountered. The initial blast at the site should be far enough away from the surrounding stream barrier areas to prevent blasted material encroaching the barrier areas. Future blasts will be oriented to minimize the potential for blasted material from entering the stream barrier area.**
7. **Mine Hard Rock Phase 1 to the west and south to Phase 1 mining limits. Phased mining increments are developed to enhance sediment collection and control. Phasing increments are developed by successively stripping sections of ~5-6 acres in size. Containment berms and low walls along the mining phase boundary are utilized to define the current mining area. A pit sump shall be utilizied in conjunction with the perimeter controls to collect pit runoff for conveyance to Basin 2. Conveyance can be achieved by Ditch 1 or by pumping.**
8. **Excess overburden that cannot be placed in perimeter berms shall be placed in the Overburden Storage Pile.**
9. **Proceed to Hard Rock Phase 2**

Hard Rock Phase 2:

A bond increment application will be submitted to DEP for Hard Rock Phase 2 opertions. Hard Rock Phase 2 will continue Hard Rock Phase 1 to the west and south.

Hard Rock Phase 2 Operation Sequence

1. **Strip and stockpile overburden.**
2. **Excess overburden that cannot be placed in perimeter berms shall be placed in the Overburden Storage Pile.**
3. **Maintain runoff controls utilized for Phase 1. Additional pit sumps may be constructed as conditions warrant.**

4. **Install highwall fall prevention berms and signage.**
5. **Mining will progress west and south to Phase 2 limits.**
6. **Proceed to Hard Rock Phase 3.**

Hard Rock Phase 3:

A bond increment application will be submitted to DEP for Hard Rock Phase 3 opertions. Hard Rock Phase 3 will continue Hard Rock Phase 2 to the west and south.

Hard Rock Phase 3 Operation Sequence

1. **Strip and stockpile overburden.**
2. **Excess overburden that cannot be placed in perimeter berms shall be placed in the Overburden Storage Pile or utilized for concurrent reclamation.**
3. **Maintain runoff controls utilized for Phase 1. Additional pit sumps may be constructed as conditions warrant.**
4. **Install highwall fall prevention berms and signage.**
5. **Mining will progress west and south to Phase 3 (SMP boundary) limits.**

Hard Rock Phase 4:

A major permit revision and bond increment application will be submitted to DEP for Hard Rock Phase 4 opertions.

Hard Rock Phase 5:

A major permit revision and bond increment application will be submitted to DEP for Hard Rock Phase 5 opertions.

Sand & Gravel Phase 1:

When market conditions demand sand and gravel from the operation, Sand & Gravel Phase 1 bond increment applicatoin will be submitted to DEP.

Sand & Gravel Phase 1 Operation Sequence:

1. **Install erosoin and sedimentation controls around mining support and Sediment Basin 1. As directed on Exhibit 9 as required by PHMC (see Module 1), install geofabric on existing ground and place material to construct the mining support area at the south end of the SMP.**
2. **Install erosion and sedimentation controls: a containment berm shall be installed around the mineral extractoin area.**
3. **Strip and stockpile overburden.**
4. **Recover sand & gravel reserves from south to north to the Phase 1 mining limits. Processing area, stockpiles and other support areas shall be relocated as necessary to facilitate mineral extraction. Stormwater runoff will be collected in the pit sump and infiltrate into the subsurface.**
5. **As each consecutive mine phase is stripped, mining equipment will be used to remove raw materials for processing. Mining equipment will develop working face(s) to an approximate elevation of 755'± (above the projected ground water elevation). Excavation to 720'± will commence when the pit floor area at elevation 755'± is of adequate size for the processing area and mineral extraction area. Recovery of material to 720'± will require mining below the water table; no pumping will be conducted to lower the water level in the pit for mineral removal. Excavators or dredging tools will be positioned on the 755'± pit floor to mine to 720'±. Both mining above and below the water table progress is dependent upon market demand and material quality.**
6. **Proceed to Sand & Gravel Phase 2.**

Sand & Gravel Phase 2:

Sand & Gravel Phase 2 bond increment application will be submitted to DEP.

Sand & Gravel Phase 2 Operation Sequence:

1. **Install erosion and sedimentation controls: a containment berm shall be installed around the mineral extractoin area.**
2. **Strip and stockpile overburden.**
3. **Recover sand & gravel reserves from south to north to the Phase 2 mining limits. Stormwater runoff will be collected in the pit sump and infiltrate into the subsurface.**
4. **As each consecutive mine phase is stripped, mining equipment will be used to remove raw materials for processing. Mining equipment will develop working face(s) to an approximate elevation of 755'± (above the projected ground water elevation). Excavation to 720'± will commence when the pit floor area at elevation 755'± is of adequate size for the processing area and mineral extraction area. Recovery of material to 720'± will require mining below the water table; no pumping will be conducted to lower the water level in the pit for mineral removal. Excavators or dredging tools will be positioned on the 755'± pit floor to mine to 720'±. Both mining above and below the water table progress is dependent upon market demand and material quality.**

EQUIPMENT:
Equipment to be used during the mining activities include: dozers, rock trucks, excavators, drills, loaders, crushers, screens, conveyors, and other equipment to support the mining operation.

HOURS OF OPERATION:
Athens Township Conditional Use approval dated 02/24/21 (see Module 1) dictates the hours of operation.

Mining Hours of Operation:
Monday – Friday: 7:00 a.m. until 5:00 p.m.
Saturday: 7:00 a.m. until 12:00 p.m.

Scale House Hours of Operation*:
Monday – Friday: 7:00 a.m. until 3:30 p.m.
Saturday: 7:00 a.m. until 12:00 p.m.
Sunday: Closed
Government Holiday: Closed

*** No mine product shall be transported off-site any day after 3:30 p.m.**

Blasting Hours of Operation:
Monday – Friday: 7:00 a.m. until 5:00 p.m.
Saturday: No blasting permitted.
Sunday: No blasting permitted.
Federal Government Holidays: No blasting permitted on the thirteen Federal holidays.

10.2 Pit Configuration

a) Identify the maximum depth of mining and the elevation of the pit floor at the maximum depth of mining for each mining phase.

HARD ROCK:
The maximum depth of mining for the operation will be ~680' or to the approximate pit floor elevation 770' MSL. The maximum height of individual cuts will vary due to the variation of the surface elevation. Bonds will be filed with the PADEP that meet the current bonding guidelines for the site.

SAND & GRAVEL:
The maximum depth of mining for the operation above the water table will be ~25' or to the approximate pit floor elevation 755' MSL. The maximum height of individual cuts will vary due to the variation of the surface elevation. The maximum depth of mining below the water table will be ~35 or to the approximate pit floor elevation 720' MSL. Bonds will be filed with the PADEP that meet the current bonding guidelines for the site.

b) If mining consolidated rock, identify the maximum highwall height and the benching interval to include the distance between the benches measured vertically (i.e. height of the working face of the bench) and the width of the benches.

HARD ROCK:

680' overall height, 50' maximum working height with at least a 25' bench (71' bench at mining limit)

The maximum highwall height may vary with the topography at the top of the cut.

Once mining progresses to the mining limits, a 71' minimum final bench with a 50' maximum highwall. Bench width can vary based upon final highwall heights provided a reclamation slope of 35 degrees can be achieved.

SAND & GRAVEL:
N/A

c) If mining consolidated rock and the reclamation plan is an alternative to approximate original contour involving restoration of the pit floor and final working face, identify the total acreage of pit floor and final graded slopes

HARD ROCK (Phases 1, 2, & 3):

Total pit floor and graded slope area = 35.6 acres

Pit floor = 9.4 acres

Final graded slopes = 26.2 acres

The final graded slopes of the highwalls will be graded to 35 degrees or less. The pit floor will be graded to provide positive drainage from the mined area to prevent ponding.

SAND & GRAVEL:
N/A

10.3 Existing Structures

Identify and describe the intended use of all existing structures or facilities to be used in connection with or to facilitate mineral removal activities. (Common existing structures include impoundments, stream crossing facilities, water obstructions and processing waste dams.)

N/A

10.4 Overburden Piles

Provide a narrative plan for reclamation of overburden piles specifying the timing and extent of overburden piles returned to the pit and final grading of the overburden pile areas for blending into existing contours.

Overburden will be stockpiled at the perimeter of the mining operation. Overburden will be utilized to construct perimeter berms and to complete reclamation behind the working face of the operation. All overburden remaining on site will be returned to the pit area as part of reclamation of the slopes, pit floor, and water safety bench. When operations allow, overburden will be utilized for reclamation as mining progresses.

Excess overburden from the Hard Rock mining area that cannot be placed in perimeter berms or stockpiles shall be placed in the Sand & Gravel Phase 1 mineral extraction area.

Maximum overburden stockpile height shall be 45'.

10.5 Final Grade and Drainage

Identify the final grading and drainage pattern, including topographic contours on Exhibit 18 and a description of compaction and stabilization techniques. Provide cross-sections or a contour map showing permit line setback(s), final postmining slopes, postmining watertable and safety benches.

HARD ROCK:
A terrace backfill plan is proposed with slope breaks (diversion ditches). Final grading and drainage pattern is detailed on the reclamation plan. Cross sections show the permit line setback, benching and reclamation grading. Basin 2 and the low wall containment berm will remain until reclamation grading is complete. Once grading and the site is stabilized, Basin 2 can be removed and the low wall containment berm reclaimed by blending to the surrounding topography. Disturbed areas will be seeded and mulched.

The topsoil will be replaced once mining has been completed. The berms located along the mining limit will remain in place until the material is needed for reclamation. The berms will minimize erosion and sedimentation during backfilling of the areas upslope by diverting runoff away from sloped areas. Refer to the cross sections for permit line setbacks and final reclamation slopes.

Compaction and stabilization techniques will utilize multiple passes over fill material with heavy tracked equipment. Sloped areas will be tracked perpendicular to the slope (ie equipment will move up and down slopes).

Post mining drainage will be directed to the east.

SAND & GRAVEL:
Maximum slopes will be 1.5:1. Final grading and drainage pattern is detailed on Exhibit 18. The topsoil will be replaced and stabilized with permanent vegetation once mining has been completed. The berms located along the mining limit will be utilized as long as possible to minimize erosion and sedimentation during backfilling of the areas upslope. A safety bench will be constructed at the water surface elevation with the typical dimensions shown in the Detail 7 on Exhibit 10.2. The safety bench shall be large enough to accommodate fluctuations in the water level.

Mining of the sand and gravel across the valley floor will not occur within 100 feet of any stream. The remaining sand and gravel deposit above normal groundwater elevation; a minimum separation of 100 feet of vegetated barrier area; and reclaimed mining area with vegetated slopes; will provide sufficient separation and stability between streams and the pits to ensure that stream migration into a pit would only be possible from a cataclysmic event that would alter the landscape of the entire valley. As the existing streams/rivers in this large valley are subjected to periodic flooding, rarely are the banks themselves altered to change the channel configuration in any significant way. At this location, the broad and shallow gradient floodplain is fairly linear which would result in relatively consistent flow velocities across the floor during floodstage, as opposed to steep gradient streams with high angle bends that are suseptable to scouring.

Compaction and stabilization techniques will utilize multiple passes over fill material with heavy tracked equipment. Sloped areas will be tracked perpendicular to the slope (ie equipment will move up and down slopes).

Post mining drainage will be to the unmanaged water impoundment.

10.6 Reclamation Timetable

Provide a sequence of operations for the accomplishment of major stages in the reclamation plan demonstrating compliance with the concurrent reclamation requirements in 25 Pa Code 77.595. Include an estimated timetable for reclamation which is tied to the mining phases and the termination of mineral extraction.

Since the operation will be dependent on the orders received for the products, a specific time table of events is not possible, however, areas which have had all mining activities completed and are graded to final grade will be reclaimed within 30 days and planted immediately or during the next planting season if reclamation occurs outside of the growing season.

10.7 Identification of Toxic Materials

When applicable (e.g., noncoal operation in coal measures) provide a detailed description of the methods used in the identification of potentially acid and toxic forming materials (boney, rooster, blossom or other inferior coal and noncoal strata) which will be encountered and separately handled. Correlate and identify these strata in the test hole data.

N/A

10.8 Special Handling of Toxic Material

When applicable (e.g. noncoal operation in coal measures) provide a detailed description of the methods to be used in the separation and handling of acid and toxic forming materials. Include transportation, storage, treatment and return of the material to the backfill. Identify the amount and source of clean fill to be placed above and below the material and the compaction and other methods to preclude combustion of the material and prevent groundwater contamination. Indicate all disposal areas on Exhibits 9 and 18.

N/A

10.9 Oil and Gas Wells

Where mining activities are proposed to be conducted within 125 feet of any oil or gas well, identify the location on Exhibits 6, 9 and 18 and provide a description of the activity. Provide a demonstration that the well has been sealed; or describe the measures to be taken to insure the integrity of the well, access to the well at all times and the well operator's consent to the proposed activity.

N/A

10.10 Wells, Exploration Holes and Bore Holes

Identify the type and location of wells, exploration holes, bore holes and monitoring wells and provide a description of the manner in which each will be cased, sealed or otherwise managed.

N/A

10.11 Underground Mines

Where proposed surface mining activities will be conducted within 500 feet of any point of either an active or abandoned underground mine (coal or noncoal), provide a description of the nature, timing, and sequence of the operation. Identify the location of each underground mine opening and the manner in which the opening will be sealed or otherwise managed including appropriate cross sections and design specifications for mine seals. Provide a description of the potential hydrologic impacts of the proposed activities, the effects on the existing groundwater system, and the effect the proposed activities will have upon abatement of pollution or the elimination of hazards to the health and safety of the public.

N/A

10.12 Public Highways

Where opening or expansion of pits are proposed within 100 feet of the outside right-of-way of a public highway, or a relocation of a public highway is proposed, identify the name and section of the public highway involved, a description of the activities to be conducted and detailed plans and cross-sections of the proposed activities. Include the written approval of the government agency having jurisdiction over the highway.

(**Note:** If the initial public notice advertisement does not contain a notice of the variance request, attach the proof of publication for advertisement of the variance.)

N/A

10.13 Public Parks and Historic Places

Where the proposed mining activities may affect any public park or historic place, provide a demonstration of the measures which will be taken to minimize or prevent adverse impacts.

Mining activities will not affect any public park. The operation is not within 300' of a public park as required by PA DEP Chapter 77 regulations.

Mining activities will not affect any historic place. Refer to PHMC information provided in Module 1.

10.14 Utilities

Where the proposed mining activities may adversely affect services provided by oil, gas, and water wells; oil and gas pipelines; railroads; utility lines; and water and sewage lines, provide a demonstration of the measures which will be taken to minimize or prevent these impacts.

No utility services will be adversely affected by the operation. Haul roads will pass under the utility lines.

When the sand and gravel mining operation approaches the electric line, the operator will coordinate with the utility to re-routing the electric service around the mining area.

10.15 Bonding Calculations

Attach a completed Bond Calculation Summary-Noncoal for consolidated (5600-FM-BMP0474) or unconsolidated (5600-FM-BMP0473) material (sand, gravel, shale, soil). Complete a Bonding Increment Application and Authorization To Conduct Noncoal Mining Activities (5600-FM-BMP0304).

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

BONDING INCREMENT APPLICATION AND AUTHORIZATION TO CONDUCT NONCOAL MINING ACTIVITIES

DEP Use Only
No.
Bond No.
Filing Fee
Amount
Date Received

Instructions

No portion of the permit area shall be affected by noncoal mining activities unless the operator has provided a bond to the Department and the Department has approved the bond and issued a written authorization to affect such area.

Submit the original of this application and two copies. The affidavit (Part F) must be properly signed and executed.

Include proper bond endorsement documents for the type of bond being used.

Part A GENERAL

Applicant: Bishop Bros Constr Co Inc
Address: 1376 Leisure Drive
Towanda, PA 18848
Telephone: 570-265-3500 .

Mine Drainage Permit No or Surface Mining Permit No.:
Operation Name: Minard Mine
Municipality: Athens Twp
County: Bradford

Name of Landowner	Municipality	County	Acres to be Affected
Jeanette H Minard	Athens Twp	Bradford	19.9

Part B Consent of Landowner Form (check applicable)

☒ The Consent of Landowner Form is attached and it has been recorded with the Recorder of Deeds.

☐ The Consent of Landowner Form was filed with Bonding Increment and Mining Authorization No. _____ and it has been recorded with the Recorder of Deeds.

☐ Not filing Consent of Landowner Form because lease was in existence prior to January 1, 1972. Operator must provide 1) a true and correct copy of the lease; 2) execute a Consent of Landowner Form as Lessee; and 3) provide a Chain of Title for the Lease. The lease, Consent of Landowner Form, and Chain of Title have been recorded with the Recorder of Deeds.

Part C Map

Attach a copy of Exhibit 9. Operations Map indicating each area where mining authorization has been granted, and the area where this bonding increment approval and mining authorization is being requested.

Part D Additional Information

1. Are you revising your erosion and sediment control plan? ☐ Yes ☒ No
   If yes, briefly describe the revisions and complete the appropriate modules and submit with this application
2. Briefly describe any proposed revisions to the surface mining permit. Include application modules and plans for the revision and professional certification where appropriate. If the revisions are subject to public notice or a stream or road variance is being requested, the proof of publication must be submitted to the Department prior to any mining authorization being granted.
3. Are you modifying your approved blasting plan for this bonding increment? ☐ Yes ☒ No
   If yes, submit blasting plan with this request (use Module 16: Blasting Plan).

Part E Bonding

Type of Bond ☐ Surety ☒ Collateral ☐ PILB Other (Specify) _____

Bond Amount

1. Bonding Calculations – Consolidated Noncoal

   Is the Bond Calculation Summary (5600-FM-MR0474) for consolidated Noncoal mining operations attached?

   ☒ Yes ☐ No

2. Bonding Calculations – Unconsolidated Noncoal (sand & gravel, unconsolidated shale, clay, etc.)

   Is the Bond Calculation Summary (5600-FM-MR0473) for unconsolidated noncoal mining operations attached?

   ☒ Yes ☐ No

3. Bond calculation is not applicable with this submittal. ☐ Date of current bond calculation _____.

Part F Application Fee

There is a fee required under 25 PA Code Chapter 77.106 for each bonding increment application. The fee is $450. Is the fee being submitted with the application? ☐ Yes ☒ No

Part G Affidavit

Commonwealth of Pennsylvania, County of Bradford

I, Andrew L Bishop being duly sworn, according to law, depose and say that I ~~(am the applicant)~~ (am an officer or official of the applicant) ~~(have the authority to make this application)~~ and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (cross out inapplicable portions in parenthesis)

Sworn and Subscribed to Before Me This

28th Day of April (month) 2023 (year)

Andrew L Bishop
Signature of Applicant or Responsible Official

Jennifer M Isaac
Notary Public

Andrew L Bishop
Name (Typed)

Title and Seal

Commonwealth of Pennsylvania - Notary Seal
Jennifer M. Isaac, Notary Public
Bradford County
My commission expires July 27, 2023
Commission number 1263879
Member, Pennsylvania Association of Notaries

1376 Leisure Drive, Towanda, PA 18848
Address

Address

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

BOND CALCULATION SUMMARY-NONCOAL CONSOLIDATED

Permittee: Bishop Brothers Construction Co., Inc.		Date: 05/05/23
Permit #:	Mine Name: Minard Mine	
Municipality: Athens Twp	County: Bradford	

Operation (see attached calculations)	Quantity	Units	Rate $/Unit	Bond Amount
Mining Area (i.e. minor grading/vegetation)	4.7	Acres	3500	16450.00
Support Area (revegetation)	15.2	Acres	1830	27816.00
Spoil Storage/Earthmoving	70000	Cubic yards	1.05	73500.00
Highwall Blasting				
Up to 20 ft Height		Linear foot	10	
>20 up to 30 Height		Linear foot	20	
>30 up to 40 Height		Linear foot	40	
>40 up to 50 Height	1440	Linear foot	55	79200.00
>50 Height		Linear foot		
Mine Sealing		Calculation		
Ponds	1	No of Ponds	3800	3800
Demolition of Structures	Lump Sum	Calculation		
Large Tires		Each		
Other Costs				
Mobilization/Demobilization	Lump Sum	Calculation	4%	8030.64
Total Reclamation Cost				208796.64
CONSOLIDATED SUBTOTAL				208796.64

March 11, 2023 Bond Rates

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING PROGRAMS

BOND CALCULATION SUMMARY-NONCOAL UNCONSOLIDATED

Permittee: Bishop Brothers Construction Co. Inc.		Date: 05/05/23
Permit #:	Mine Name: Minard Mine	
Municipality: Athens Township		County: Bradford

Operation (see attached calculations)	Quantity	Units	Rate $/Unit	Bond Amount
Mining Area (i.e. minor grading/vegetation)	0	Acres	3500	0
Support Area (revegetation)	0	Acres	1830	0
Spoil Storage/Earthmoving		Cubic yards		
Highwall Height				
Up to 35 ft	0	Acres	1700	0
>35 ft up to 65 ft		Acres		
>65 ft		Acres		
Water Impoundment Safety Bench		Acres		
Ponds		No of Ponds		
Demolition of Structures	Lump Sum	Calculation		
Large Tires		Each		
Other Costs				
Mobilization/Demobilization	Lump Sum	Calculation	4%	
Total Reclamation Cost				0
CONSOLIDATED SUBTOTAL				208796.64
SITE TOTAL				208796.64

March 11, 2023 Bond Rates

Bond Calculations

Minard Mine 05/05/23

General Description: 15.2 acres of support area
4.7 acres of pit area to ~770' in Phase 1

Refer to: Exhibit 9 Operations Map dated 05/05/23

Table 1: Highwall Height Variation Summary

Point	Elevation	Highwall Height	Height	Length	Highwall Face Area	Cost / LF of Highwall *	TOTAL
	feet	feet	feet	feet	SF	$ / LF	$
Highwall = 820							
A -A1	820		50	550	27500	55	30,250.00
Highwall = 870							
B - B1	870		50	520	26000	55	28,600.00
Highwall = 920							
C - C1	920		50	370	18500	55	20,350.00
				1,440	72,000	TOTAL	79,200.00

Table 2: Highwall Summary

Highwall Height	Cost / LF of Highwall *	Length	
feet	$ / LF	feet	
0-20'	10	0	0
21-30'	20	0	0
31-40'	40	0	0
41-50'	55	1440	79,200
50'+	75	0	0
			79,200

Table 3: OB Storage Pile

	Volume
	CY
OB Storage	70000
	70,000

Table 4: Noncoal Consolidated Summary

Item	Rate*	Unit		Quantity	Total
Pit Floor	$3,500.00 $/ac	acres		4.7	16,450.00
Support	$1,830.00 $/ac	acres		15.2	27,816.00
Earthmoving	$1.05 $/CY	CY	see Table 3	70,000	73,500.00
Highwall	varies	LF	see Table 2	1,440	79,200.00
Sed Pond	$3,800.00 $/EACH	EACH		1	3,800.00
	Site Mobilization (min of 4% total cost or $40,000)				$8,030.64
				Total	$208,796.64

* Rates from PA Bulletin Volume 53 Issue 10 dated 03/11/23

Module 12: Erosion and Sedimentation Controls
[§§77.458/77.461/77.466/77.525/77.527/77.531/Chapter 102]

12.1 Diversion Controls

Provide a plan for the collection and conveyance to a natural drainageway of the runoff from upslope undisturbed areas. Provide a separate general design for a temporary highwall diversion which limits the amount of runoff which can enter the pit (where applicable). Include design criteria, capacity calculations, profile of proposed channel slopes, typical cross-sections, required channel linings and applicable details on 12.1 Data Sheet.

HARD ROCK:
Upslope highwall diversions will direct runoff away from the mining areas to limit the amount of runoff which can enter the pit.

Berms will be utilized to divert runoff away from the mining areas. Placement of overburden and/or topsoil berms upslope of the mining areas will prevent runoff from entering the mining area. Berms will be constructed to minimize upslope ponding by diverting runoff away from the active mining areas.

SAND & GRAVEL:
Due to the topography of the site, there is limited upslope drainage to the site. Drainage will be controlled within the permit boundary.

12.2 Erosion and Sediment Control

Provide a plan for the control of erosion and sedimentation for lands within the permit area to be disturbed by mining activities. Include a narrative describing the implementation of the plan, and detailed design and construction plans and specifications for structures or facilities used in the plan. The plan must include each phase or phases of mining. Include design criteria, capacity calculations, profile of proposed channel slopes, typical cross-sections, required channel linings and applicable details on 12.1 Diversion/Collection Ditch Data Sheet for collection and interceptor ditches. Provide documentation of the capacity of the existing drainage system and the effect proposed mining activities will have on the drainage. Show discharge points to natural drainageways and culverts that intercept upslope drainage or carry drainage away from the site. Show facilities to scale on Modules 9 and 16 as appropriate.

The proposed mining operation will not negatively impact the surrounding areas or degrade the pre mining environmental balance by the management of the stormwater runoff and/or snowmelt. This management plan is based upon the implementation of the erosion and sedimentation controls as described herein and Module 10. Erosion and sedimentation controls will be installed prior to the commencement of earthmoving activities. The area of concern will be cleared of all vegetation prior to any earthmoving activities. Topsoils and overburden will be removed and stored at the perimeter of mining operations. The stockpile berms will serve two purposes: 1) The storage of topsoils for redistribution after mining has been completed, and 2) the retention of stormwater runoff within the area to be mined. Once vegetation has become established on berms, the operation will be virtually self-contained during normal climatic conditions. The typical stockpile berm configuration will be constructed along the perimeter of operation. There is sufficient material at the site to construct the berms to this configuration and complete concurrent reclamation. Stockpile berms (topsoil and/or overburden) will be constructed with available material in conjunction with reclamation activities. Berms will be seeded and mulched immediately after construction with a permanent grass seed mixture.

EXISTING E&S CONTROLS:
N/A

PROPOSED E&S CONTROLS:
Berms, diversions, drainageways, sediment traps, sediment basins, and treatment basins will utilized by the proposed operation. Erosion and sedimentation controls will be installed as detailed in the construciton sequence in Module 10.

Perimeter berms will serve multiple functions: 1) diversion of upslope runoff away from the mining area, 2) containment of onsite runoff, 3) the storage of topsoil and overburden for redistribution after mining has been completed, and 4) serve as a protective barrier (safety, sight and sound) to the general public in the area.

CONSTRUCTION SEQUENCE:

The operation will be bonded prior to mining. The topsoil will be stripped ahead of mining and stored along the perimeter of the mining area. These soil storage areas will be in place to ensure that the site can be revegetated for the proposed post mining land uses. The topsoil berms and overburden berms will also act as a containment system to keep any sediment laden runoff from leaving the site. Once vegetation has become established on the soil storage berms, the operation will be virtually self-contained so that under normal climatic conditions all runoff from the site will be directed to sediment basin. All berms will be seeded and mulched immediately after construction with the permanent grass seed mixture found in Module 23.

Refer to Module 10 for detailed construction sequence.

The mine operator will install stream crossings in accordance with recommended conservation measures. Removal of existing riparian vegetation will be limited to only areas necessary for installation of the stream crossing and E&S controls. E&S controls identified in Module 10, 12, and 14 and Exhibit 14 will be utilized to minimize impacts of construction and mining activities to the waterway.

PA FISH & BOAT COMMISSION PNDI CONSERVATION MEASURES:

PNDI 701203 (see Module 1) recommends PFBC conservation measures to maintain a natural flow regime, high water quality, and quantity. Maintenance or restoration of the riparian corridor will aid in connecting habitats and improving water quality and quantity for fish and mussels. PFBC recommends retaining (or restoring, if not already present) a riparian buffer (100 to 300 feet, if possible) on each side of the waterway (river, stream, creek). This buffer should be vegetated with native plant species. When adequately vegetated, this upland buffer will act to stabilize the streambanks (preventing or minimizing erosion), and filter pollutants (e.g., sediment, fertilizers, pesticides, road salt, oil). Where streambanks have become badly eroded (e.g., due to previous removal of native riparian vegetation), streambank fencing and/or bioengineering restoration techniques are recommended (geotextile, root wads, vegetative stabilization), rather than riprapping the streambanks; removing gravel bars; or attempting to dredge, ditch, channelize, or widen the stream. Use stringent erosion and sedimentation controls before, during, and after project implementation to ensure that sediment and contaminants do not enter any waterway(s) (rivers, creeks, streams, tributaries) or waterbodies (lakes, ponds).

DCNR RECOMMENDED BEST MANAGEMENT PRACTICES:

Refer to DCNR response to PNDI 701203 (see Module 1).

1. **Use a conservative approach to project design that minimizes permanent and temporary disturbances to soil and native vegetation. This will conserve habitat and limit opportunities for invasive plants.**
2. **Clean boot treads, tools, construction equipment, and vehicles thoroughly (especially the undercarriage and wheels) before they are brought on site. This will remove invasive plant seeds and invasive earthworms/cocoons that may have been picked up at other worksites.**
3. **Use clean project materials (e.g., weed-free straw) or materials native to the worksite to avoid introducing invasive species from contaminated sources.**
4. **Revegetate or cover disturbed soil and stockpiles quickly to discourage the germination of invasive plants. Implement proper erosion control practices to stabilize soil and reduce runoff.**
5. **Do not use seed mixes that include invasive species. More information about invasive plants in Pennsylvania can be found at the following link: http://www.dcnr.pa.gov/Conservation/WildPlants/InvasivePlants/Pages/default.aspx**
6. **Use habitat appropriate seed mixes. For example, use a riparian seed mix when reseeding along a waterway.**
7. **Monitor for invasive plants before, during, and after project activities and promptly control any identified infestations. Frequent monitoring allows for early detection and rapid response.**

DETAILED DESIGN REPORT

Surface Hydrology Diversion/Interceptor Ditches, Culverts, and Other Channels:

Unless otherwise noted, all structures were designed to accommodate a 24 hour/10 year storm event of P10=4.2" for Bradford County. Precipitation values were obtained from Table 2-1 DEP Engineering Manual for Mining Operations. Peak flows were determined by using methods as found in the Soil Conservation Service Field Manual, Chapter 2; or calculated by DEP criteria of 2.75 cfs/acre of drainage area for the 10 year event for a permanent ditch; or by computer generated hydrograph. The hydrographs, pond routing and other hydrologic data were generated by using TR-55 methodology performed by HydroCAD 10.00 (software program). Where hydrographs were used, printouts of the data are included for the specific structure. Input data for either method includes an assumed CN of 89 for disturbed areas, and a weighted CN or field verified CN for undisturbed areas, typically CN=71.

Hydraulics:
Flows were determined using Manning's formula for both triangular and trapezoidal channels where:

Q=VA and V=1.49/n(R2/3)(S1/2)

Values for "n" were based on newly built conditions for bare earth, vegetated channels, or rock lined (riprap) channels. Velocities therefore reflect newly built conditions. Vegetated channel capacity is evaluated with a retardance C, "Veg C", condition value (e.g. unmowed channels). Refer to Table 6.3 "Manning's "n" for Trapezoidal Channels with Vegetative Stabilization (Retardance C)" page 131 of the PADEP Erosion and Sediment Pollution Control Program Manual, Final, Technical Guidance Number 363-2134-008, March 2012. Linings were designed to protect this situation. Depths of flow and total design depths shown are to be calculated from the top of the material used for lining.

Channel Protection:
Protection specifications for channels are based on S.C.S. recommendations and DEP standards. The following is a summary of linings to be used for various velocities on a "rule of thumb" basis; however, the operator may choose to use a higher grade of protection in the channel as field operations warrant.

GRASS	**0 to 4.5 fps**
JUTE MATTING OR REGULAR CURLEX BLANKET	**4.5 to 5.4 fps**
HIGH VELOCITY CURLEX BLANKET AND GRASS OR	**5.5 to 9.0 fps**
RIP RAP (d50=6") RIPRAP AS SHOWN ON MODULE 12.1 DITCH DETAIL	**9.0+ fps**

Riprap is an erosion resistant ground cover of large, loose and angular stone to protect the soil surface from erosive forces, slow velocities and to stabilize slopes with seepage problems. The following table was used to determine the size of rip-rap needed based on the velocities calculated for the various structures.

Riprap Class	Graded Rock Size (in inches)			Permissive
	Max	d50	Min	Velocities (fps)
R-1	1.5	.75	#8	2.5
R-2	3.0	1.5	1.0	4.5
R-3	6.0	3.0	1.0	6.5
R-4	12.0	6.0	3.0	9.0
R-5	18.0	9.0	5.0	11.5
R-6	24.0	12.0	7.0	13.0
R-7	30.0	15.0	12.0	14.5
R-8	48.0	24.0	15.0	15.0 +

Permissible velocities are based on rock at 165 lb/ft3.

Installation instructions for rip-rap and geotextile materials are obtained from the manufacturer. Dependent on the availability of material and the supplier, there may be minor adjustments required based on individual instructions included with the material to be used.

It should be noted that the attached specifications are to be followed as closely as possible during installation. However, due to the nature of the equipment used to install these structures, design standards and capacities may be exceeded from those approved. In some cases, a higher form of protection may be used in channels.

MAINTENANCE:

A good maintenance program will result in an improved service life of the erosion and sedimentation control structures. Inspection on a regular basis (approximately 2-3 weeks and/or following a storm event) will ensure all devices are within proper tolerances of the design criteria. All corrections necessary will be done immediately. Should any material need to be removed during the maintenance procedures, and they are non toxic in nature, they will be stored and redistributed with topsoils at the time of planting.

GENERAL NOTES:

1. **The attached exhibits and typical drawings are to be used as a general guideline; however, changes or modifications should be made to fit field conditions.**
2. **Computer programs were used to:**
   a. **Determine channel dimensions, depths of flow and velocities.**
   b. **Calculated the velocities and channel capacities (Q) for existing channels and streams based on topographic configurations found in the field.**
3. **A design error of 10% is assumed to be inherent in all design charts**
4. **The use of Jute Matting or Regular Curlex blanket (manufactured by Amxco) or its equivalent is recommended over seeded areas in lieu of only jute matting for velocity of 4.5 to 5.4 fps and replacing riprap for velocities of 5.4 to 7.0 fps with the High Velocity Curlex Blanket. Just as effective as jute, recent literature shows the blanket to be a more economical means of bank protection, plus allowing for the added protection of grass cover. It also makes reclamation of the structure more efficient.**
5. **See attached typicals for all design specifications.**

REFERENCE-APPENDIX

Bigatel, Alan J. et al, "Engineering Manual for Mining Operations." Commonwealth of Pennsylvania. 1999

Chow, Ven Te, Ph.D. "Open Channel Hydraulics" New York: McGraw-Hill Book Company, 1988 (reprint)

"Design Manual Part 2 Highway Design: Publication 13M, July 2002 Edition." Commonwealth of Pennsylvania, Pennsylvania Department of Transportation, Bureau of Design.

"Erosion and Sediment Pollution Control Program Manual." Commonwealth of Pennsylvania Department of Environmental Protection Office of Water Management. March 2012

"FlowMaster", Haestad Methods, Waterbury Conn (computer program)

"HydroCAD 10.00", HydroCAD Software Solutions, LLC (computer program)

"Specifications: Publication 408/2000." Commonwealth of Pennsylvania, Pennsylvania Department of Transportation, Bureau of Design.

12.3 Haul Roads

Provide the following information for each haul road to be constructed, reconstructed or used in the operation:

Note: Activities proposed to be conducted under General permit for Temporary Road Crossings (BMR-GP-101) and General Permit for Access Road Crossings (BMR-GP-102) must include a completed Notification Form, with attachments, for the respective General Permit (i.e., Form 5600-FM-MR0054 for BMR-GP-101 and Form 5600-FM-MR0059 for BMR-GP-102). BMR-GP-102 may not be used for haul roads.

a) Location; show on Exhibit 9 (and Exhibit 18 if road will remain as part of postmining land use);
As detailed below, temporary cartways within the mining area will be constructed according to the requirements of PA Chapter 77.631. There will be one (1) access point to the operation from T-303.

All haul roads in the permit area shall remain post mining at the direction of the landowner.

b) Description and typical cross-sections showing the construction of the haul road including existing ground, grades, slopes, culvert locations, outlet protection and other drainage control;
Temporary roads which are constructed for accessing the pit area will be constructed to maintain safe grades. Due to the configuration of the site, any runoff from temporary roadways will be directed to the pit area or support area with controls as described in part (c) of this section.

c) Measures to control and prevent erosion and sedimentation; include proposed spacing of sediment traps, turnouts, culverts, check dams, etc.;
All roadways within the permit area will be designed, constructed and maintained to prevent erosion to the maximum extent possible and to prevent contributions of sediment to streams or runoff outside the affected area, and air and water pollution.

Once the haul road enters the pit area, temporary controls will be instituted. These controls will primarily consist of the way in which the roadway is constructed and maintained. Because of the temporary nature of these cartways, any areas of disturbance have been included in the calculations for interceptor ditches/sediment ponds.

As the mining progresses and areas are backfilled and stabilized, erosion and sedimentation controls will be installed along the length of the cartways. These controls may consist of culverts, level spreaders, roadside ditches and water-bars. The spacing of these controls will follow the Chapter 102 regulations as found in the Erosion and Sediment Control Manual of March 2012.

Care will be taken to construct the roads with positive drainage being maintained. The cartways will be sloped and outslopes mulched. Temporary roads will not be constructed in areas which are unstable or which are subject to wet soils. Should it become necessary for fill material to be added to the road, it will be non-toxic in nature.

d) Plan for reclamation after mining is completed;
Upon completion of mining operations or utilization for maintenance, haul roads that are to be reclaimed shall be re-graded to blend with surrounding contours and conform to the proposed drainage pattern. All topsoils will be replaced and the areas reseeded and mulched as outlined in Module 23.

e) If the haul road involves the crossing of any intermittent or perennial stream or wetland include Module 14 Streams/Wetlands;
Crossings will be utilized for Tutelow Creek and UNT 1 to Tutelow Creek; see Module 14.

f) Will a PennDOT highway occupancy permit be needed? ☐ Yes ☒ No

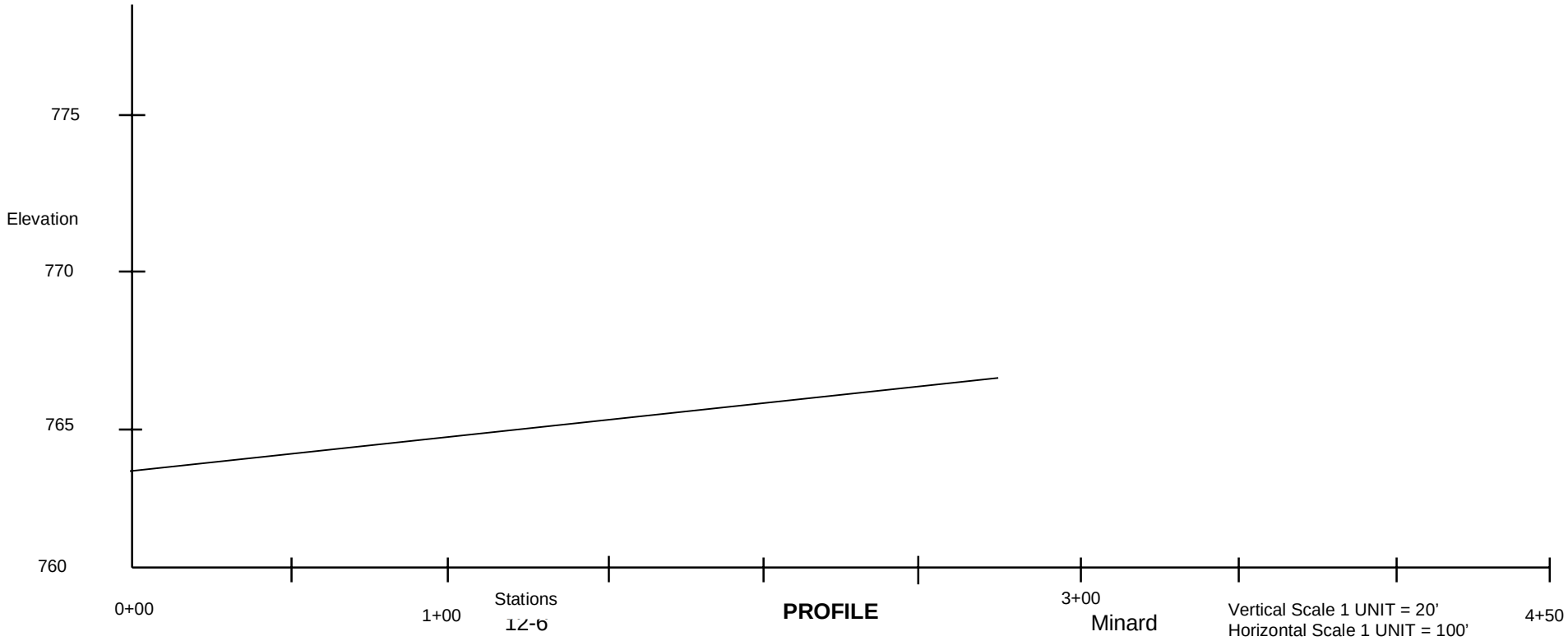
If yes, PennDOT Occupancy Permit number must be submitted prior to permit activation.

12.1 Diversion/Collection Ditch Data Sheet

Title: **Ditch 1**	Site: Minard Mine	Company: Bishop Brothers Constr. Co. Inc.	Permit Number:
Prepared by: Tract Engineering, PLLC	Telephone Number: 814-272-0301	Date: 05/05/23	Sheet 1___ of 1___

Design Calculations:

Station		Drainage Area acres	Design Storm (yrs.)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q cfs	Channel Bed Slope (%)	Freeboafd (ft.)	Channel Lining	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes	Flow Area (sq.ft.)	Flow Depth (ft.)	Top Flow Width (ft.)	Flow Velocity (ft/sec)	Q Available cfs	With Freeboard		
Start End	Eleva-tion																	Channel Depth (ft.)	Top Channel Width (ft.)	Q Available cfs
0+00	763	40	25	2	98	190	1	1	native stone	0.04	4	1	32	4	12	6.1	195	5	14	306
2+90	766																			

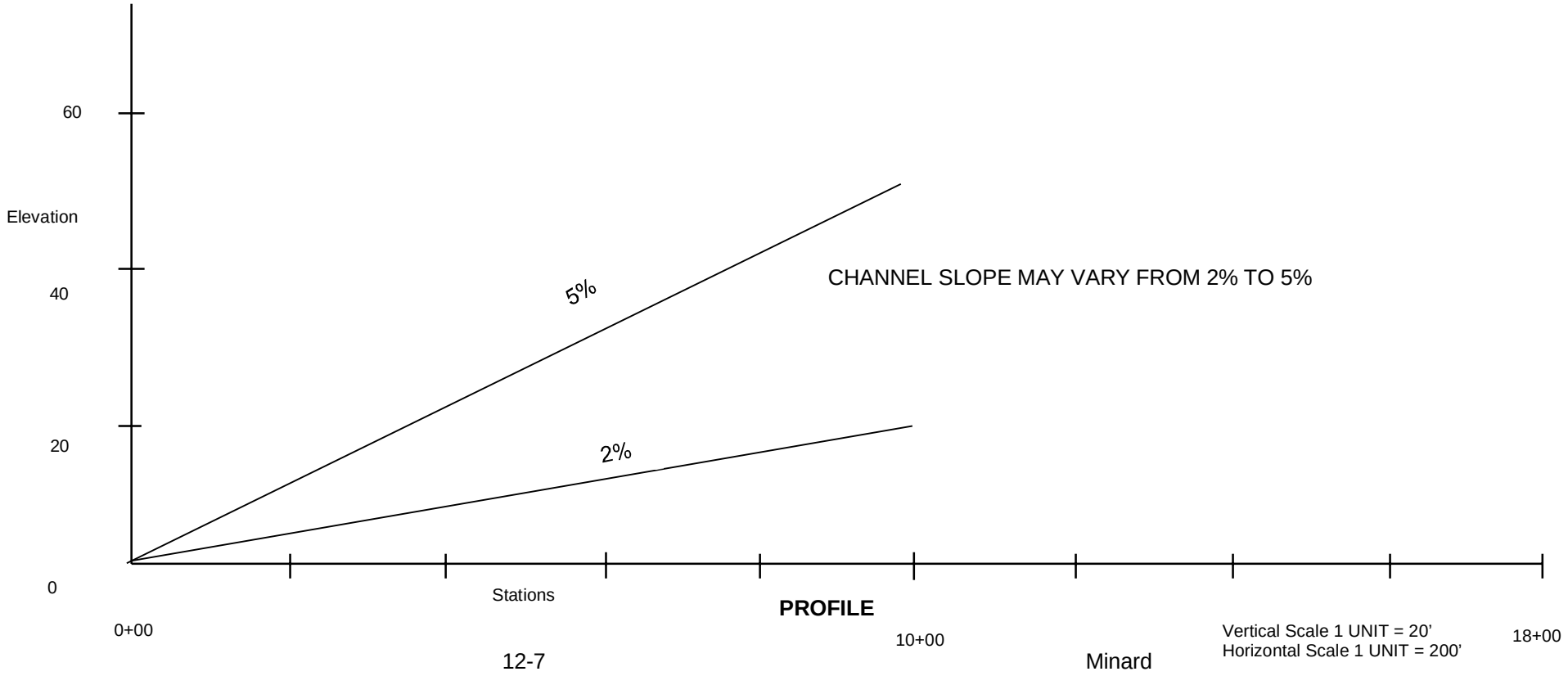


12.1 Diversion/Collection Ditch Data Sheet

Title: **West Slope Diversions**	Site: Minard Mine	Company: Bishop Brothers Constr. Co. Inc.	Permit Number:
Prepared by: Tract Engineering, PLLC	Telephone Number: 814-272-0301	Date: 05/05/23	Sheet 1___ of 1___

Design Calculations:

Station		Drainage Area acres	Design Storm (yrs.)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q cfs	Channel Bed Slope (%)	Freeboafd (ft.)	Channel Lining	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes	Flow Area (sq.ft.)	Flow Depth (ft.)	Top Flow Width (ft.)	Flow Velocity (ft/sec)	Q Available cfs	With Freeboard		
Start / End	Eleva-tion																	Channel Depth (ft.)	Top Channel Width (ft.)	Q Available cfs
0+00	0	1.5	10	70	90	4.1	2	1	ROCK	0.035	1	2	1.87	0.75	4	3.4	6.4	2	9	60
10+00	20																			
0+00	0	1.5	10	70	90	4.1	2	1	ROCK	0.035	1	2	1.87	0.75	4	3.4	6.4	2	9	95
10+00	50																			

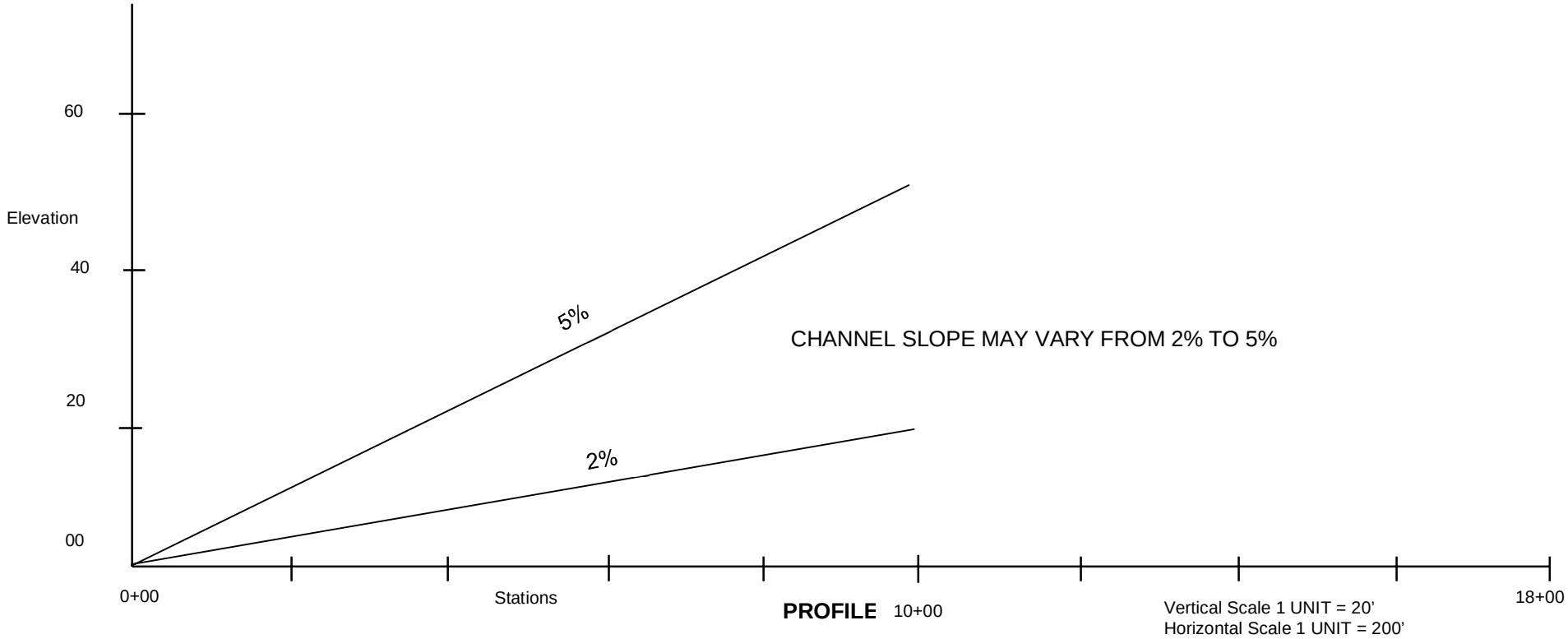


12.1 Diversion/Collection Ditch Data Sheet

Title: **East Slope Diversions**	Site: Minard Mine	Company: Bishop Brothers Constr Co Inc.	Permit Number:
Prepared by: Tract Engineering, PLLC	Telephone Number: 814-272-0301	Date: 05/05/23	Sheet 1___ of 1___

Design Calculations:

Station																	With Freeboard		
Start End	Eleva-tion	Drainage Area acres	Design Storm (yrs.)	Average Watershed Slope (%)	Curve Number	Peak Discharge Q cfs	Channel Bed Slope (%)	Freeboafd (ft.)	Channel Lining	Manning's Coefficient (n)	Channel Bottom Width (ft)	Channel Side Slopes	Flow Area (sq.ft.)	Flow Depth (ft.)	Top Flow Width (ft.)	Flow Velocity (ft/sec)	Q Available cfs	Channel Depth (ft.)	Top Channel Width (ft.)	Q Available cfs
0+00	0	3.2	10	70	90	8.8	2	1	ROCK	0.035	1	2	3	1	5	4.0	12	2	9	60
10+00	20																			
0+00	0	3.2	10	70	90	8.8	5	1	ROCK	0.035	1	2	1.87	0.75	4	5.4	10.1	2	9	95
10+00	50																			



Module 13: Impoundments/Treatment Facilities

[§§77.457/77.461/77.526/77.531/Chapter 105]

13.1 Treatment

Provide a plan for the treatment of surface and groundwater drainage from the areas disturbed by the mining activities. Include a construction and treatment narrative, flow diagram, design criteria, and design calculations (which include the proposed capacity) of the treatment facilities. Identify treatment chemicals to be used. Do not include any facilities included in Module 12.

Basin 2 (Treatment Facility)

Surface water accumulating in the pit, as well as any ground water encountered during mining will be conveyed to the sump prior to conveyance to Basin 2. Basin 2 will discharge runoff from the site. The primary focus of treatment will be settling of solids in the runoff. When the sediment holding capacity of the basin has been reached, the basin will be cleaned. This refuse will be incorporated into the site reclamation. The basins should be cleaned when fines reach designed cleanout depth (1/3 of basin depth, max.).

The treatment basin volume was determined by the volume of water conveyed to the treatment facility.

Final discharge of Basin 2 will be via closed conduit to Tutelow Creek to Outfall 002.

The basin design and construction is detailed in Module 13.3(c)

In the event suspended solids do not settle in a timely manner in the basins, a flocculant will be utilized to promote settling of suspended solids. MasterCat 4239, a liquid cagulant, supplied by Process Masters or equivalent may be utilized to treat water to effluent limits. Field testing shall be performed to determine the proper dosage. The flocculant will be dosed near the end of Ditch 1. Turbulent flow in the ditch and into the basin will promote mixing of the flooculant and stormwater. Basin 2 is divided into two (2) cells by a rock filter berm. The multi-cell basin configuration will promote settling of solids in the first cell and polishing in the second cell. In addition, the outlet pipe is valved to stop the discharge should water quality effluent limits not be met.

Settled solids will collect in the basins. Basins will be inspected quarterly to evaluate the volume of solids collected. The volume of collected solids collected in the basin will determine when sediment will need to be removed from the basins.

Product data sheet for MasterCat 4239 attached (pg 13-13) and a SDS (pg 13-14).

13.2 Quarry/Pit Sump

Provide a description of the sump including size, location, depth, method of pumping, etc. (Key location to Exhibits 6.2 and 9).

Support Area for Hard Rock Mining (located in the Sand & Gravel Phase 1 mineral extraction area):

Support Area Sumps (infiltration ditches) will be located at the edges of the proposed support area for the initial bond increment for the hard rock mining area. The sumps will be excavated into the unconsolidated gravel and infiltrate runoff into the substrate. Refer to Exhibit 9 for locations of Support Area Sumps.

Water will be conveyed by overland flow to the Support Area Sumps. Sumps will be inspected monthly and cleaned by operator on an as-needed basis to ensure infiltration capacity.

Hard Rock Mining, Phase 1, 2, & 3:

The proposed pit will be utilized as a sump to collect pit water. A 50'x50'x10' (or as conditions warrant) sump will collect rainfall/snowmelt events. The sump elevation and location will change as mining progresses.

Water will be conveyed from the sump as condition warrant. The operator will a diesel powered trash pump or gravity channel to convey water from the sump to a treatment basin.

Quarry sump volume design considerations:

1. **Maximum drainage area of the phase of mining.**
2. **During a major rainfall/snowmelt event, the pit floor will be used for stormwater storage. A conservative estimate of available area for runoff storage is approximately 15% of the pit floor area.**

Using the equation V= 1.33 (ARC) from section 6.4 of the DEP Mining Manual where:

A = maximum drainage area in square feet

R = 4.2 inches in 24 hours = 0.35 ft /24 hrs

C = 0.5

V = volume in cubic feet

TABLE 13-1: PIT STORAGE CAPACITY DURING MINING

	Calculated Drainage Area	*Design Drainage Area*	*Design Criteria*	*Required Volume*	*Pit Floor Storage Area ~15% of DA*	*Calculated Approximate Water Depth*
	ACRES	ACRES		CF	AC	FT
Phase 1 Pit Floor	3.6	5	V = 1.33 ARC	51,000	0.75	1.6
Phase 1+2 Pit Floor	7.4	10	V = 1.33 ARC	102,000	1.5	1.6
Phase 1+2+3 Pit Floor	37.1	40	V = 1.33 ARC	406,000	6	1.6

The calculated water depth is less than the pit depth and/or perimeter berm depth.

The pit sump must be constructed away from the working face. All traffic (equipment and trucks) shall be routed around the pit sump area. Traffic shall not run through pit water. See "Pit Sump Location" detail on Exhibit 10.2.

In the event the pit does not dewater in a timely manner, the operator will move to other benches above the water level.

13.3 Dams and Impoundments (General) Do not include any facilities included in Module 12

a) Proposed use.

Basin 1 (Sediment Basin)

Runoff from the Support Area will be collected in Basin 1 by containment berms constructed along the perimeter of the Storage Area. The primary focus of treatment will be settling of solids in the runoff. When the sediment holding capacity of the basin has been reached, the basin will be cleaned. This refuse will be incorporated into the site reclamation. The basin should be cleaned when fines reach the designed cleanout depth. The basin volume was determined by the basin's drainage area and 7000 CF/acre storage defined in the DEP Engineering Manual. Of the 7000 CF, 2000 CF/acre is for sediment storage.

When Phase 1 Sand & Gravel mining commences, runoff from the Support Area will be directed to the pit sump. Areas of the Support Area that cannot drain to the Phase 1 Sand & Gravel pit sump will continue to drain to Basin 1.

Basin 1 discharge will be via closed conduit to Outfall 001 to Tutelow Creek.

Basin discharge rates and stormwater volumes were established using the TR-55 methodology and/or V =CIA. Where:

TR-55:

24 hour storm event rainfall: ***Engineering Manual Table 2-1***

2 yr = 2.8 inches
10 yr = 4.2 inches
25 yr = 4.9 inches
50 yr = 5.4 inches
100 yr = 5.8 inches

CN = 89 for mined areas & 71 for unmanaged habitat (Hydrologic Soil Group D)
Tc = calculated for each drainage area

V =CIA

V= Volume in cubic feet
A = Area of open pit, areas between highwall and diversion ditch, and area that drains into the pit
I = Rainfall (in feet)/24 hours x detention time of 6 hours.
C = % of rainfall not absorbed by soils.
1. Open pit = 0.50
2. Area above backfill = 0.30
3. Backfilled area = 0.25

All basin construction will be conducted as detailed in Module 13.3(c) along with proposed capacity calculations.

Basin 2 (Treatment Facility):
The series of multiple treatment cells in Basin 2 is designed to treat water conveyed from the pit sump. Water collected in the pit will be conveyed to the first treatment cell. Once the water has entered the basin, it will flow through the various cells permitting the sediments to settle prior to discharge. A flocculant may be utilized should effluent limits required treatment of suspended solids.

The basin has been designed with sufficient storage capacities and residency to allow for efficient material processing. See Module 13.3(c)

Basin 2 discharge will be via closed conduit to Outfall 002 to Tutelow Creek.

b) Map and location (key to maps).

Refer to Exhibit 9

c) Provide a design report and construction plans and specifications to include detailed cross-sections and plan view scale drawings of the proposed structure which show: principal spillway, dewatering devices, embankment details (including maximum height, top width, and cutoff trench), crest of emergency spillway and existing ground.

Refer to Exhibit 7/10 (cross sections), Exhibit 9, and Exhibit 10.15, and exhibits included with this module for impoundment details.

BASIN 1 (Sediment Basin) - Surface Hydrology:
Peak flows were determined by either utilizing the SCS Engineering Field Manual Charts or by creating a hydrograph for the upslope watershed for the design storm (10, 25 or 50 year event) utilizing HydroCAD 10.00. Time of concentration was determined using the TR-55 calculations for sheet flow (not to exceed 50'), shallow concentrated flow, and channel flow. CN values were input based on the number of disturbed areas or current field conditions for those areas not to be disturbed. These were then "weighted" within the program. The hydrographs were then used to determine the maximum water surface elevation in the basins along with the requirement to discharge within 2-7 days. Results of the analysis are included herein.

BASIN 1 - Geometrics:
Sedimentation basins are designed to provide at a minimum of a total of 7,000 cu. ft. of storage per disturbed acre contributory to the basin (5,000 cu. ft. for undisturbed areas) at the basin crest. Sediment storage was calculated at 2,000 cu. ft. per disturbed acre. Upslope areas which will not be impacted by the mining activities were included in the basin design at 5,000 cu ft.

Volumes were computed using prismoidal, trapezoidal or triangular volumetric formulas applied to achieve the design volumes required.

Emergency spillways are designed to have sufficient capacity so that the combination of temporary storage capacity above the principal spillway and the discharge from the principal spillway will safely convey the runoff from a 24 hour storm. Ponds with 20 acres of drainage or less will be designed to handle the 25 year storm event, and basins with 20-100 acres will be designed to convey the 50 year event. Ponds which are to remain permanently will have an emergency spillway capable of handling a routed 100 year storm.

Basin 1 will be located at the south end of the storage area. The basin will function as a sediment basin during mining and the emergency spillway is designed to convey the 25 year storm event. The principal spillway is a 10" hooded drain pipe and the dewatering pipe is a valved standpipe. The basin will discharge from the permit at Outfall 001. Table 13-2 summarizes the elevations and storage capacities.

Rock filter volume is deducted from the gross volume of the basin. Each filter is 8' top width, 18' bottom width, 5' tall, & 35' wide. The volume of one (1) rock filter is 2,275 CF = [5x8 + (2)(5x5/2)] x 35. Assume 40% voids, rock volume is 1,365 CF.

The volume of one (1) rock filter at the sediment storage elevation is 736 CF = [2x14 + (2)(2x2/2)] x 23. Assume 40% voids, rock volume is 442 CF.

TABLE 13-2: BASIN 1 STORAGE CAPACITY - DRAINAGE AREA = 3 ACRES

	Elevation	*Length*	*Width*	*Gross Volume (ft^3)*	*Net Volume (ft^3)*
Top	762	202	47	46820	45455
Emergency Spillway	759	190	35	22670	21305
Principal Spillway	758	186	31	16470	15105
Sediment Storage	756	178	23	6630	6188
Bottom	754	170	15	0	0

To prevent short circuiting of the basin, all runoff will enter the north end of the basin and discharge from the south end. If the detention time in the basin is inadequate to settle solids, a rock filter berm may be added to promote settling.

Accumulated sediment will be removed from the basin and included in the reclamation as mining progresses.

For the 25 year storm event:
Basin 1 inflow is 24 cfs. The emergency spillway is designed to convey the influent flow. Calculations are provided on pages 13-21 and 13-22.

Basin 2 (Treatment Facility)

Geometrics:
The multi-cell treatment basin was designed to provide a total of twelve (12) hours of detention time based upon the dewatering rate of pit pump. The operator will use a 200 gpm trash pump to dewater the pit.

12 hrs x 200 gpm = 19,500 ft3

Treatment System = 19,500 + 33% additional storage = 26,000 ft3

Volumes were computed using prismoidal, trapezoidal or triangular volumetric formulas applied to achieve the design volumes required.

Basin 2 rock filter volume is deducted from the gross volume of the basin. Each filter is 8' top width (max), 20' bottom width (max), 6' tall, & 44' wide. The volume of one (1) rock filter is 3696 CF = [6x8 + (2)(6x6/2)] x 44. Assume 40% voids, rock volume is 2,218 CF. Deduct this rock volume from the gross basin volume at the principal spillway elevation.

TABLE 13-3: BASIN 2 STORAGE CAPACITY DURING MINING

	Elevation	*Length*	*Width*	*Gross Volume (ft^3)*	*Net Volume (ft^3)*
Top	772.25 (+10.25')	241	61	92980	90762
Spillway	768 (+6')	224	44	41000	38782
Bottom	762 (+0')	200	20	0	0

38,782 CF > 26,000 CF of required storage.

Accumulated sediment will be removed from the basin and included in the reclamation as mining progresses when sediment reaches 1/3 depth of basin.

For the 25 year storm event:
Basin 2 potential inflow is 180 cfs. The emergency spillway is designed to convey the influent flow. Calculations are provided on pages 13-21 and 13-22.

Refer to Exhibit 10.2 for basin details.

Basin Construction Specifications (Basins 1 & 2):

1. **Prior to the beginning of excavations, the topsoil from the impoundment construction area will be removed and stockpiled per Module 21.**

2. **The embankment will be constructed with slopes as noted on the construction details or flatter. As a rule of thumb, the total ratio of the slopes will be 5:1 assuming a 10' top width embankment. Incised slopes will be steeper (vertical to 1:1).**

3. **There will be a "key-way" cutoff incorporated into the embankment to aid in the stability of the structure, and to prevent seepage.**

4. **The embankment will be constructed in lifts of 8" (eight inch) maximum thickness and compacted by a minimum of four (4) passes of the loader or dozer over each lift.**

5. **No cobbles, boulders, or rock fragments having a maximum dimension of more than 5" (five inches) shall be incorporated into the embankment.**

6. **No brush, sod, roots, or other perishable or unsuitable materials shall be placed in the embankment.**

7. **The embankment shall have a minimum crest width of 10.0' (ten feet).**

8. **Seeding and mulching of the embankment shall be at the rates and by the methods contained in Module 23. In the event of winter construction, disturbed areas will be seeded and mulched as soon as practicable. Embankment out slopes will be mulched.**

9. **Select material will be placed adjacent to the discharge pipe in 6" (six inch) lifts and compacted to prevent seepage and scouring. Anti-seep collars will be incorporated into the embankment as an additional safety measure for smooth pipe over 6" (six inches) in diameter or corrugated pipe over 12" (twelve inches).**

10. **The emergency spillways will be a trapezoidal type with 3:1 sideslopes; and constructed on undisturbed ground. Where topographic conditions do not allow for the emergency spillway to be constructed on original ground, added measures will be taken to assure the stability of the spillway. These would include the placement of a geotextile foundation from the crest to original ground with the addition of riprap over the fabric.**

11. **If design specifications require additional protection, a rock lining will be placed at the point of discharge in the emergency spillway. This rock will be D50=6" at 165 lb/cu. ft. or equivalent or as specified in the individual pond design sheets. The spillway slopes are to be rip-rapped. Placement of the rock will be over a filter bed 6" (six inches) in depth, 2" (two inch) coarse aggregate or a geotextile base can be used.**

12. **Riprap shall be placed to grade in a manner to ensure that the large rock fragments are uniformly distributed with smaller fragments placed to fill the residual spaces and create a densely placed, uniform, well keyed layer of riprap of the specified thickness.**

13. **It should be noted that the designs submitted are to be followed as closely as possible.**

d) Complete a Certification Form for each structure as appropriate:
Sediment Pond Certification form 5600-PM-BMP0408
Treatment Pond Certification form 5600-PM-BMP0455

Refer to page 13-9 for Basin 1 Sediment Pond Certification.
Refer to page 13-11 for Basin 2 Treatment Pond Certification.

e) If the impoundment is located outside of the area covered by the geology and hydrology description contained in Modules 7 and 8, include a preliminary geology and hydrology report.

N/A

f) Describe the potential effect on the structure from subsidence from underground mining when applicable.

N/A

g) If the detailed design plans are not included with the initial submittal of this application, identify when the detailed design plans will be submitted. (**Note:** The detailed design plans must be approved by the Department before construction of the structure begins.)

N/A

13.4 Class C Dams

N/A

13.5 Operation and Maintenance Requirements

Describe the operation and maintenance requirements for the structure, including dewatering of the impoundments following storm events.

BASIN 1 (Sediment Basin)

Basin 1 will operate as a sediment basin. The basin is designed to provide 7000 ft3/acre of storage for disturbed areas. The lowest level of dewatering will provide 2000 ft3/acre of sediment storage. Dewatering of the basins will be achieved via a valved perforated stand pipe. The outlet will be as close to original ground and protected by riprap. The basin will require periodic sediment removal as to provide storage capacity. The dimensions and placement have been designed with anticipated maintenance in mind. In the unlikely event that the basins reach their maximum storage capacity, the emergency spillway will be activated.

OPERATION:

1. **Basin 1 will operate as a sediment basin on an as needed basis. Runoff from the Support Area will be conveyed to Basin 1.**
2. **The operator will evaluate the conditions of the Basin 1 water quality. If the suspended solids concentration is high (turbid water), the water shall be permitted to settle the suspended solids prior to discharge by closing the discharge valve of the dewatering pipe. Once water quality meets effluent standards, water can be discharged to Outfall 001.**
3. **Discharge water will be conveyed via a pipe to Outfall 001.**
4. **The operator shall collect a water sample when Basin 1 is discharging at Outfall 001. The NPDES permit dictates the frequency of monitoring.**

BASIN 2 (Treatment Facility):

Basin 2 will operate as a treatment basin on an as needed basis. Pit sump water will be conveyed to Basin 2 by gravity flow or pumped when needed. There is no pumped discharge from Basin 2; discharge will be by gravity.

OPERATION:

1. **Basin 2 will operate as a treatment basin on an as needed basis. Pit water will be conveyed to Basin 2.**
2. **The operator will evaluate the conditions of the Basin 2 water quality. If the suspended solids concentration is high (turbid water), the water shall be permitted to settle the suspended solids prior to discharge. Once water quality meets effluent standards, water can be discharged to Outfall 002. In the event suspended solids do not settle in a reasonable time period, the operator may utilize a flocculent to accelerate settling of the solids. Dispense flocculent in accordance with the manufacturer's recommendations.**
3. **Discharge water will be conveyed via a pipe to Outfall 002.**
4. **The operator shall collect a water sample when Basin 2 is discharging at Outfall 002. The NPDES permit dictates the frequency of monitoring.**

MAINTENANCE:

Inspection will be made after each storm event and on a monthly basis. The operator or assigned person will inspect the basin and its associated structures to include: condition of the outlet structure, deficiencies in the collection ditches, an evidence of instability of the embankment, the presence of vegetative cover, and any accelerated erosion occurring at the discharge points or by rill and gully erosion of the embankments themselves.

Corrective measures will include the reseeding of any areas which may require additional cover. If the season is not favorable to the germination of seeds, a mulch cover of straw or hay will be substituted. Discharge structures (the principal discharge point or the emergency spillway) will be inspected to assure performance standards. Should additional rock be needed or the size increased due to abnormally high flows, it will be done on an "as needed" basis.

Structural failures or instabilities will be referred to the engineer for further investigation and corrective measures. Until such time as the repairs can be made, the operator will inspect the structure in question daily, and have available on site a pump capable of dewatering the basin in a timely manner should it become necessary.

Sediment shall be removed from the basin when the storage capacity has reached one third (1/3) of the depth of the basin. Removal will be accomplished by either pumping or mechanical dredging. Sediments will then be transported to be stored or spread over backfilled areas and used as a topsoil layer.

Exhibit 9, typical drawings and details on Exhibit 10.1 and Exhibit 10.2, and information presented in this Module are to be used as a general guideline; however, changes or modifications should be made to fit field conditions.

13.6 Removal

Describe the timetable and plans for removal of the impoundment and reclamation of the area.

Basin 1 and 2 will be removed at the completion reclamation of the contributing drainage area to the basin.

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SEDIMENT POND CERTIFICATION

Permittee: Bishop Bros Constr Co Inc Site Name: Minard Mine SMP No.: _____

Engineer/Land Surveyor: Tim Gourley, PE Structure ID #: Basin 1 NPDES Outfall ID #: 001

Location (point of discharge): Latitude (DMS): 41 58 01.6 Longitude (DMS): 76 32 42.6

Drainage Area: 3 acres Design Storm: 25 year / 24 hour Rainfall Amount: 4.2 inches

Average Watershed Slope: 2 Land Use: SUPPORT Soil Type: N/A Curve Number: 89

Peak Discharge: 23 cubic feet/second NPDES Average Flow: 0.03 mgd NPDES Design Flow: 0.4 mgd

		Permit Application	***As Constructed***
Embankment	Top Width (Minimum)	10'	
	Outside Slope (Maximum) (H:V)	---	
	Inside Slope (Maximum) (H:V)	---	
	Top Elevation	762	
	Bottom Elevation	754	
	Upstream Toe Elevation	n/a	
	Downstream Toe Elevation	n/a	
	Type of Cover	vegetation	
	Incised Slope (if any)	YES	
	Inside Slope (Maximum) (H:V)	2:1	
	Top Elevation	762	
	Bottom Elevation	754	
Principal Spillway	Type	10" hooded pipe	
	Conduit Diameter (if barrel/riser give both)	10" PVC	
	Inlet Elevation	758	
	Outlet Protection	R3	
	Spillway Capacity (cubic feet/second)		
Dewatering Device	Type/Size	standpipe	
	Inlet Elevation	756	
	Discharge Regulation (self-draining or valved)	valved	
	Discharge Capacity (cubic feet/second)		
	Time to Dewater Full Pond		
Emergency Spillway	Type	broadcrested weir	
	Width	25'	
	Depth (with 2 feet of freeboard)	3'	
	Length	24'	
	Sideslopes (H:V)	3:1	
	Crest Elevation	759	
	Slope	2%	
	Type of Lining/Protection	R3	
	Spillway Capacity (provide design calculations)	24 cfs	
Storage Capacity	Length @ Bottom	170	
	Width @ Bottom	15	
	Length @ Dewatering Device	178	
	Width @ Dewatering Device	23	
	Volume @ Dewatering Device	6630-442(FILTER)=6188	
	Length @ Principal Spillway	186	
	Width @ Principal Spillway	31	
	Volume @ Principal Spillway	16470-1365(FILTER)=15105	
	Length @ Crest of Emergency Spillway	190	
	Width @ Crest of Emergency Spillway	35	
	Volume @ Crest of Emergency Spillway	22670-1365(FILTER)=21305	

Will the sediment pond be constructed in previously disturbed, fractured, or unconsolidated material? ☒ Yes ☐ No

If yes, specify the type of liner that will be used: NONE

SEDIMENT POND CONSTRUCTION CERTIFICATION

Permittee: Bishop Bros Constr Co Inc Site Name: Minard Mine SMP No.: _____

Engineer/Land Surveyor: _____ Structure ID #: Basin 1 NPDES Outfall ID #: 001

1.	Has the facility been constructed at the location shown in the approved permit?	☐ Yes	☐ No	
2.	Is the emergency spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	
3.	Is the principal spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	☐ NA
4.	Is the dewatering device constructed at the location shown in the approved plan?	☐ Yes	☐ No	
5.	Are the collection channel inlets constructed at the location shown in the approved plan?	☐ Yes	☐ No	
6.	Do the collection channel inlets have adequate inlet protection?	☐ Yes	☐ No	
7.	Has the liner been installed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
8.	Has the non-discharge alternative been constructed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
9.	Was coal encountered during construction of the pond?	☐ Yes	☐ No	
10.	If yes, was a liner used?	☐ Yes	☐ No	
11.	Identify any conditions or deficiencies in the facility that need to be corrected.			☐ NA

_____

_____

_____

Stage of Construction (specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation, non-discharge alternative construction)	**Date of Inspection**	**Inspected By**

Supervising Professional Engineer/Registered Professional Land Surveyor _____

Address and phone _____

_____

_____

I certify in accordance with 25 Pa Code Section 77.531, 87.112, 89.101, or 90.112 that the above-mentioned structure is complete and has been constructed.

_____
Signature of Registered Professional Engineer/Registered Professional Land Surveyor Date

_____
Registration Number and Expiration Date

SEAL

_____ _____
Signature of Permittee or Responsible Official Date Title

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TREATMENT POND CERTIFICATION

Permittee: Bishop Bros Constr Co Inc Site Name: Minard Mine SMP No.: _____
Engineer/Land Surveyor: Tim Gourley, PE Structure ID #: Basin 2 NPDES Outfall ID #: 002
Location (point of discharge): Latitude (DMS): 41 58 04.1 Longitude (DMS): 76 32 51.1
Treatment Basin Sizing Calculation: V = 1.33 (A R C) + (Expected Groundwater Inflow Rate to Pit x Design Detention Time)
Drainage Area to System: 5 acres Design Storm: 25 year / 24-hour Rainfall Amount: 4.2 inches
Detention Time: 12 hours Expected Groundwater Inflow Rate to Pit: 0 gpm
Required Basin Volume: 26000 cubic feet NPDES Average Flow: 0.04 mgd NPDES Design Flow: 0.3 mgd

		Permit Application	***As Constructed***
Basin #: 2 Embankment	Top Width (Minimum)	10	
	Outside Slope (Maximum) (H:V)	3	
	Inside Slope (Maximum) (H:V)	2	
	Top Elevation (with 2 feet of freeboard)	772.25	
	Bottom Elevation	762	
	Upstream Toe Elevation	---	
	Downstream Toe Elevation	---	
	Type of Cover	vegetation	
	Incised Slope (if any)	YES	
	Inside Slope (Maximum) (H:V)	1:1	
	Top Elevation	772.25	
	Bottom Elevation	762	
Basin #: 2 Spillway	Size/Type	8" PVC	
	Inlet Elevation	768	
	Outlet Protection	R3	
	Spillway Capacity (cubic feet/second)	0.5	
Basin #: 2 Storage Capacity	Length @ Bottom	200	
	Width @ Bottom	20	
	Length @ Spillway	224	
	Width @ Spillway	44	
	Volume @ Spillway	41000-2218 (FILTER)=38782	
	Sludge Cleanout Elevation	764	
Emergency Spillway	Type	broadcrested weir	
	Width (ft)	45’	
	Depth with 2’ of freeboard (ft)	3.58	
	Length (ft)	18	
	Sideslopes (H:V)	3:1	
	Crest Elevation	768.67	
	Slope	2%	
	Type of Lining/Protection	R4	
	Spillway Capacity (cfs)	207 (190 required)	

Will the treatment pond be constructed in previously disturbed, fractured, or unconsolidated material? ☐ Yes ☒ No

If yes, specify the type of liner that will be used: _____

Note: If additional basins are necessary, please complete and attach an additional form.

TREATMENT POND CONSTRUCTION CERTIFICATION

Permittee: Bishop Bros Constr Co Inc Site Name: Minard Mine SMP No.: _____
Engineer/Land Surveyor: _____ Structure ID #: Basin 2 NPDES Outfall ID #: 002

1.	Has the facility been constructed at the location shown in the approved permit?	☐ Yes	☐ No	
2.	Is the spillway constructed at the location shown in the approved plan?	☐ Yes	☐ No	
3.	Has the liner been installed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
4.	Has the non-discharge alternative been constructed in accordance with the approved plan?	☐ Yes	☐ No	☐ NA
5.	Was coal encountered during construction of the pond?	☐ Yes	☐ No	
6.	If yes, was a liner used?	☐ Yes	☐ No	
7.	Identify any conditions or deficiencies in the facility that need to be corrected.			☐ NA

_____
_____
_____

Stage of Construction (specify stage e.g. layout, impoundment/embankment construction, spillway/piping installation, non-discharge alternative construction)	**Date of Inspection**	**Inspected By**

Supervising Professional Engineer/Registered Professional Land Surveyor _____
Address and phone _____
_____
_____

I certify in accordance with 25 Pa Code Section 77.531, 87.112, 89.101, or 90.112 that the above-mentioned structure is complete and has been constructed.

_____
Signature of Registered Professional Engineer/Registered Professional Land Surveyor Date

SEAL

_____
Registration Number and Expiration Date

_____ _____
Signature of Permittee or Responsible Official Date Title

MASTERCAT 4239

GENERAL DESCRIPTION

MasterCat 4239, a liquid coagulant, is a highly effective treatment for wastewater clarification, clay, and color removal. This product can handle large swings in pH, temperature, alkalinity, organics, and solids loading. MasterCat 4239 achieves superior total suspended solids results while minimizing the dose.

MasterCat 4239 provides easy product handling by direct injection without the need for a makeup system. The resulting superior performance over traditional treatments translates into lower dosages, fewer deliveries, more effective storage, and potentially lowers overall treatment costs. If faster settling rates of suspended material are required, the MasterFloc series can be overlaid. In most cases, this is not required.

PRODUCT APPLICATION

MasterCat 4239 should be fed with a genuine MasterCat feed system. This feed system is supplied and serviced by your Process Masters representative as part of the treatment program as long as you are using Process Masters products. Feeding of MasterCat products should always be done in a manner that enables the best continuous distribution and mixing of the product. Your Process Masters representative will assist you with the proper product feed points and feed rate.

PHYSICAL DESCRIPTION

Form	Liquid	**pH**	4.0 - 4.4
Appearance	Yellowish	**Solubility in Water**	Complete
Odor	None	**Freeze Point**	20°F
Bulk Density	10.04 - 11.21 lbs./gal.	**Boiling Point**	230°F
Specific Gravity	1.33 - 1.35	**Vapor Pressure**	None

DOSAGE

Your Process Masters representative will run all the tests required to determine the optimum product and dosage for your application.

COMPATIBILITY

Compatible: FRP, PVC, HDPE, or Rubber

PACKAGING

55 gallon reusable drums, 275 gallon reusable totes, and 2,000-4,000 gallon bulk quantities.

FOR MORE INFORMATION

Please contact your local Process Masters representative.

Process Masters
Custom Process Solutions

940 Krumsville Road
Kutztown, PA 19530
(610) 683-5674
Processmasterscorp.com

1. Identification Of The Product

Product Name: **MasterCat 4239**

Company Identification: Process Masters Corporation
Kutztown, Pennsylvania. 19530
Emergency Phone Number: 610-683-5674

2. Hazards Identification

OSHA/HCS Status: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of the product.

Classification of the substance or mixture: No classified.

GHS label elements:
Signal word: No signal word.
Hazard statements: No known significant effects or critical hazards.

Precautionary statements:
Prevention: Not applicable.
Response: Not applicable.
Storage: Not applicable.
Disposal: Not applicable.

Hazards not otherwise classified: None known.

3. Composition and Information of Ingredients

Substance/mixture: Mixture

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4. First Aid Measures

Description of necessary first aid measures
Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. .
Skin contact: Flush contaminated skin with plenty of water. Get medical attention if symptoms occur.
Ingestion: Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable or breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects:

Eye contact:	No known significant effects or critical hazards.
Inhalation:	No known significant effects or critical hazards.
Skin contact:	No known significant effects or critical hazards.
Ingestion:	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact:	No known significant effects or critical hazards.
Inhalation:	No known significant effects or critical hazards.
Skin contact:	No known significant effects or critical hazards.
Ingestion:	No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments:	No specific treatments.
Protection of first aiders:	No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11).

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:	Use an extinguishing agent suitable for surrounding fire.
Unsuitable extinguishing media:	None known.
Specific hazards arising from the chemical:	No specific fire or explosion hazard.
Hazardous thermal decomposition products:	Decomposition products may include the following materials: Halogenated compounds; metal oxide/oxides.
Special protective actions for fire-fighters:	No special protection is required.
Special protective equipment for fire-fighters:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
For emergency responders:	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel."
Environmental precautions:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Spill: Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and Storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure Controls / Personal Protection

Control parameters

Occupational exposure limits: None

Appropriate engineering controls: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases, or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection:

- Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Body protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection: Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. Physical and Chemical Properties

Physical state:	Liquid	Lower and upper explosive (flammable) limits:	Not available
Color:	Colorless to light yellow	Vapor Pressure:	Not available
Odor:	None	Vapor Density:	1 [Air=1]
Odor threshold:	Not available	Relative Density:	1.33 to 1.35
pH:	4 - 5	Solubility:	Easily soluble in the following materials: cold water and hot water
Melting Point:	-7° C (19.4° F)	Solubility in Water:	Not available
Boiling Point:	110° C (230° F)	Partition coefficient: n-octanol/water	Not available
Flash Point:	Not applicable	Auto-ignition temperature:	Not available
Burning time:	Not applicable	Decomposition temperature:	Not available
Burning rate:	Not applicable	SADT:	Not available
Evaporation Rate:	Not available	Viscosity:	Not available
Flammability (solid,gas):	Not available		

10. Stability and Reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability: The product is stable.
Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid: No specific data.
Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials and metals.
Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological Information

Information on toxicological effects

Acute toxicity: There is no data available.
Irritation/Corrosion:
- Skin: There is no data available.
- Eyes: There is no data available.
- Respiratory: There is no data available.

Sensitization:
- Skin: There is no data available.
- Respiratory: There is no data available.

Mutagenicity: There is no data available.
Carcinogenicity: There is no data available.
Reproductive toxicity: There is no data available.
Teratogenicity: There is no data available.
Specific target organ toxicity (single exposure): There is no data available.
Specific target organ toxicity (repeated exposure): There is no data available.
Aspiration hazard: There is no data available.

Information on the likely routes of exposure: Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects:
Eye contact: No known significant effects or critical hazards.
Inhalation: No known significant effects or critical hazards.
Skin contact: No known significant effects or critical hazards.
Ingestion: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics:
Eye contact: No known significant effects or critical hazards.
Inhalation: No known significant effects or critical hazards.
Skin contact: No known significant effects or critical hazards.
Ingestion: No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure:
Short term exposure:
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.
Long term exposure:
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.
Potential chronic health effects:
General: No known significant effects or critical hazards.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates: There is no data available.

12. Ecological Information

Toxicity

Product/ingredient name	Result	Species	Exposure
Product	Chronic EC 6999 mg/L Chronic LC50 3623 mg/L	Daphnia – Daphnia magna Fish – Fathead minnow	- -

Persistence and degradability: There is no data available.
Bioaccumulation potential: There is no data available.
Mobility in soil: Soil/water partition coefficient (Koc): -2.49
Other adverse effects: No known significant effects or critical hazards.

13. Disposal Considerations

Disposal Methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any byproducts should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the

requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport Information

	DOT Classification	IMDG	IATA
UN number	Not regulated	Not regulated	Not regulated
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing Group	-	-	-
Environmental hazards	No.	Yes.	No.
Additional information	-	-	-

Special precautions for user: **Transport within user's premises**: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

15. Regulatory Information

US Federal regulations:
TSCA 8(a) CDR Exempt/Partial exemption: Not determined.
United States Inventory (TSCA 8b): All components are listed or exempted.
Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs): Not listed
Clean Air Act Section 602 Class I Substances: Not listed
Clean Air Act Section 602 Class II Substances: Not listed
DEA List I Chemicals (Precursor Chemicals): Not listed
DEA List II Chemicals (Essential Chemicals): Not listed

SARA 302/304
Composition/information on ingredients: No products were found.
SARA 304 RQ: Not applicable.

SARA 311/312
Classification: Not applicable.
Composition/information on ingredients: No products were found.

State regulations:
Massachusetts - None of the components are listed.
New York - None of the components are listed.
New Jersey - None of the components are listed.
Pennsylvania - The following components are listed: Dialuminium Chloride Pentahydroxide
California Prop. 65: No products were found.

International regulations:
International lists: Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.

Korea inventory:	All components are listed or exempted.
Malaysia inventory (EHS Register):	Not determined.
New Zealand Inventory of Chemicals (NZloC):	All components are listed or exempted.
Philippines inventory (PICCS):	All components are listed or exempted.
Taiwan inventory (CSNN):	Not determined.

Chemical Weapons Convention List Schedule I Chemicals:	Not listed
Chemical Weapons Convention List Schedule II Chemicals:	Not listed
Chemical Weapons Convention List Schedule III Chemicals:	Not listed

16. Other Information

Key to abbreviations:

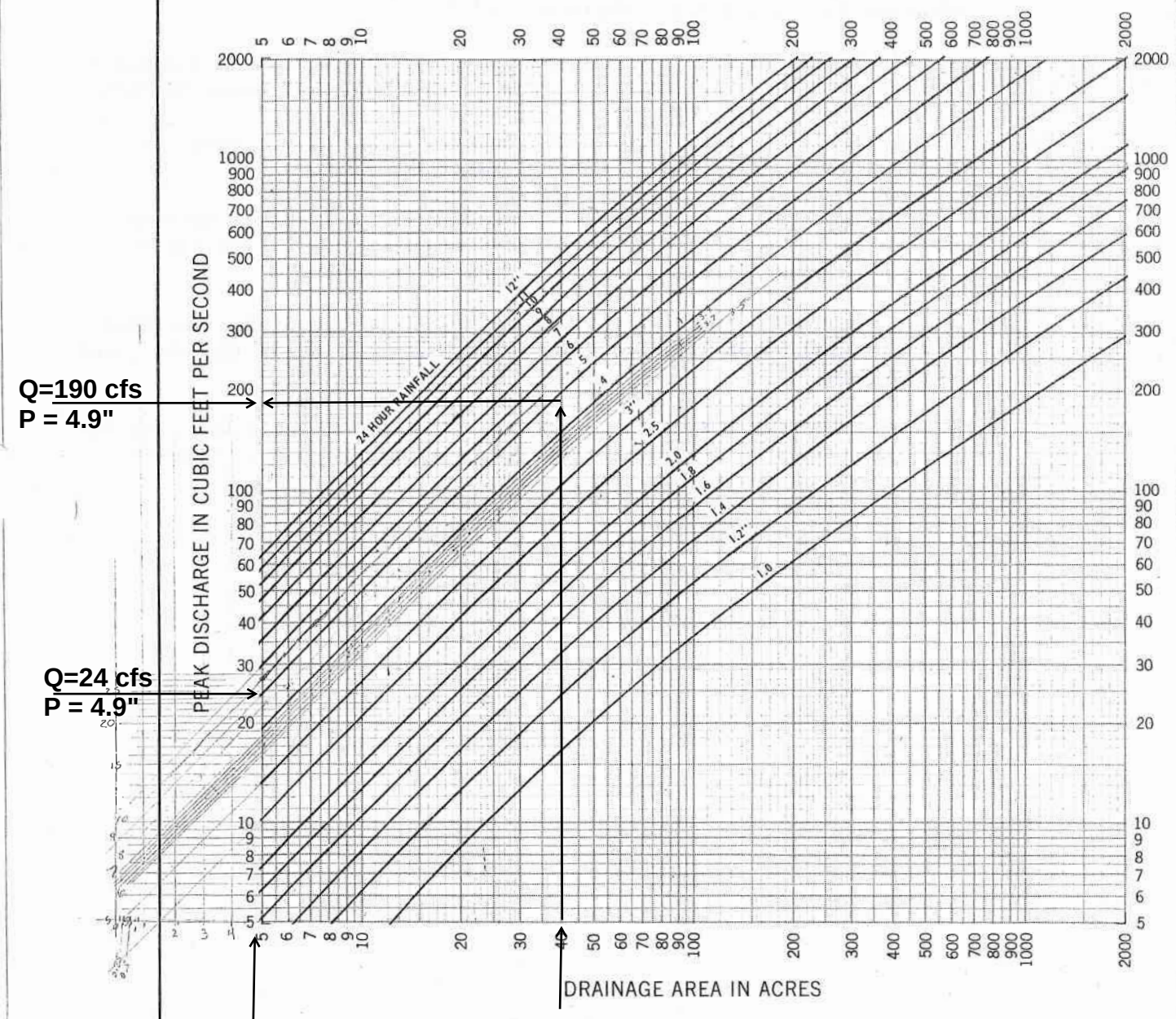
ATE =	Acute Toxicity Estimate
BCF =	Bioconcentration Factor
GHS =	Globally Harmonized System of Classification and labeling of Chemicals
IATA =	International Air Transport Association
IBC =	Intermediate bulk container
IMDG =	International Maritime Dangerous Goods
LogPow =	Logarithm of the octonal/water partition coefficient
MARPOL 73/78 =	International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN =	United Nations

PEAK RATES OF DISCHARGE FOR SMALL WATERSHEDS
TYPE II STORM DISTRIBUTION

2-75

SLOPES - STEEP
CURVE NUMBER - 90

24 HOUR RAINFALL FROM US WB TP-40



Q=190 cfs
P = 4.9"

Q=24 cfs
P = 4.9"

5 ac (min)

40 ac

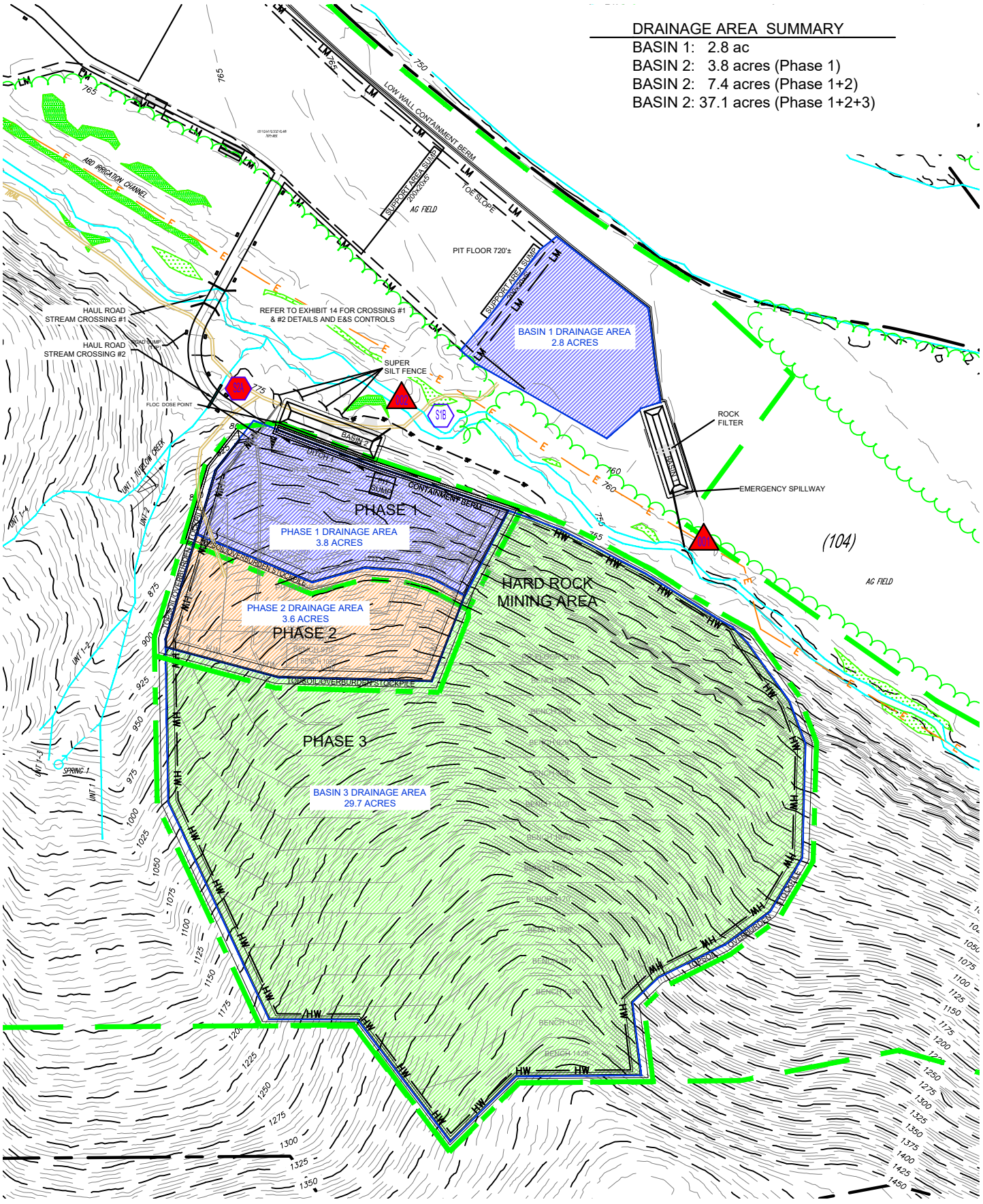
Exhibit 2-10

25 YEAR PEAK RUNOFF
BASIN 1 = 24 cfs
BASIN 2 = 190 cfs

REFERENCE		STANDARD DWG. NO.
"Chapter 2, Engineering Field Manual for Conservation Practices"	U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ENGINEERING DIVISION - HYDROLOGY BRANCH	ES-1027 SHEET 21 OF 21 DATE 2-15-71

Weir Flow: **Q = C L H^1.5**

	C	L	H	Qs	Q max (25 yr)	Qs > Qmax
		ft	ft	cfs	cfs	
Basin 1	2.8	25	0.5	24.7	24	YES
Basin 2	2.5	45	1.5	206.7	190	YES



Date: 05/05/23	PROJECT: Minard Mine Bishop Brothers Construction Co. Inc. Athens Township, Bradford County, Pennsylvania	**TRACT ENGINEERING, PLLC** 120 Ridge Avenue State College, PA 16803 814 272 0301 www.TractLLC.com	PROJECT NO.: 20.0113 DRAWING NO.: Minard DRAWN BY: tsg 05/05/23 CHKD BY: TSC 05/05/23
Rev No: 0			
Sheet No: 1 of 1	TITLE: Exhibit 13.3: Basin Drainage Areas		REV. DATE BY COMMENT