## Bintrim, Tyler J LRP

**From:** Kyle Schwabenbauer [kschwabenbauer@eadsgroup.com]
**Sent:** Thursday, June 25, 2009 9:21 AM
**To:** Bintrim, Tyler J LRP
**Cc:** 'Rick Tote'; 'Rob Stormer'; mjones@eadsgroup.com
**Subject:** RE: 2008-280 Glacial Sand and Gravel Co. Mine 47

**Attachments:** Mod 14 UNT#1 6-24-09.doc; Mod 14 UNT#3 6-24-09.doc; Mod 14 Wetland 1 6-24-09.doc; Mod 14 Wetland 4 Temp 6-24-09.doc; Mod 14 Wetlands 2-4 6-24-09.doc; Impact Summary Table 6-24-09.xlsx

Mod 14 UNT#1 6-24-09.doc (53 ... | Mod 14 UNT#3 6-24-09.doc (52 K... | Mod 14 Wetland 1 6-24-09.doc (... | Mod 14 Wetland 4 Temp 6-24-09.... | Mod 14 Wetlands 2-4 6-24-09.do... | Impact Summary Table 6-24-09.x...

Tyler,

I've attached revised Module 14 forms for each of the streams and wetlands as well as an impact summary table that should clarify the proposed temporary and permanent impacts to each aquatic resource. To answer your questions:

1. No impacts to the perennial UNT #1 are anticipated. Stream mitigation for the 190' of impacts to the intermittent UNT #3 has not been proposed due to the constructed nature of the channel (farm ditch) and the fact that the stream provides very limited ecological functions and values.

2. Proposed stream impacts are listed in linear feet. Acreages of proposed stream impacts have not been calculated and are not included in the proposed acreage of the wetland mitigation area.

3. Acreage of the non-jurisdictional (per USACE) Wetland 3 (0.19 acre) have been included in the total impact acreage (1.89 acres) so that it is accounted for in the mitigation acreage (1.90 acres).

Please let me know if you have any additional questions. Thank you!

Kyle Schwabenbauer

Environmental Specialist

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-----Original Message-----
From: Bintrim, Tyler J LRP [mailto:tyler.j.bintrim@usace.army.mil]
Sent: Monday, June 08, 2009 3:13 PM
To: Michal Jones
Cc: Kyle Schwabenbauer; Rick Tote; Rob Stormer
Subject: RE: 2008-280 Glacial Sand and Gravel Co. Mine 47

Michal,

I left you a voice mail also pertaining to the Mine 47 project in Butler County. I'm not sure which figures are the most up to date with regards to the proposed impact. In order to prepare the public notice I need to have accurate figures.

The application form proposes to fill 1.77 acres of wetland. The Module 14 sheets propose 650 Linear Feet to UNT 1 and 0.2 and 0.9 acres to UNT 3. It is preferred to have the stream impact in linear feet. Has any stream mitigation been considered for these impacts? Are these impacts lumped into the 1.77 acres?

It appears from Module 14 that 1.84 acres is proposed to impact wetland 2, 3, and 4 with an additional 0.01 acres being temporarily impacted for a sewer line in wetland 4. Remember wetland 3 is considered non jurisdictional to the Corps as it is isolated.

I think a impact table might be the best way to clear this up. Please respond within 30 days with the impact so the Public Notice may be prepared.

Sincerely,

Tyler J. Bintrim

Regulatory Project Manager

U.S. Army Corps of Engineers Pittsburgh District

Federal Building, 20th Floor

1000 Liberty Avenue

Pittsburgh, PA 15222

P: 412-395-7115

-----Original Message-----

From: Bud Davis [mailto:ddavis@eadsgroup-clarion.com]

Sent: Friday, April 03, 2009 3:23 PM

To: Bintrim, Tyler J LRP

Cc: Kyle Schwabenbauer; Michal Jones; Rick Tote; Rob Stormer

Subject: RE: 2008-280 Glacial Sand and Gravel Co. Mine 47

Mr. Bintrim:

As requested we are providing the following information for the Public Notice pertaining to Glacial Sand and Gravel Company's Section 404 permit application:

1. Attached is a copy of the USGS Slippery Rock quadrangle that indicates the permit boundary.

2. Attached are 8 ½ x11 pages of the ponds, processing plant and wetland mitigation construction that shows the resource impacts.

3. Wetland No. 1 will not be directly or indirectly impacted by the proposed mining and wetland mitigation construction. Ground water elevations

to the south of Wetland No. 1 will remain the same within and surrounding the permitted area. Due to no anticipated impacts to this wetland community, a separate module was completed for this resource. Please refer to PA DEP Module 14, Streams/Wetlands, North of West Liberty Road, Wetland No. 1.

4. Because Wetlands No. 2, 3 and a portion of 4 will be permanently impacted as a result of the mining operation and Wetland No. 4 will also be temporarily impacted as a result of the construction of a sanitary pipeline crossing, two (2) separate Module 14 documents (Wetland No. 2, 3 and 4 and Wetland No. 4 (Temporary Impacts)) were completed. Attached is the text from the alternatives discussion from both modules for your convenience and these discussions can be found in Module 14, Section 14.4(b).

5. Also, discussions for specific wetland mitigation and restoration measures can be found within the same modules discussed above in Section 14.5(a)(3). Attached for your convenience is the text from these modules.

I hope this information meets your need for the Public Notice and Section 404 Permit. If you have any questions please contact Michal L. Jones - Stewart, Project Manager at 814-764-5050 or mjones@eadsgroup.com.

From: Bintrim, Tyler J LRP [mailto:tyler.j.bintrim@usace.army.mil]

Sent: Friday, March 27, 2009 8:38 AM

To: Bud Davis

Subject: 2008-280 Glacial Sand and Gravel Co. Mine 47

Mr. Davis:

I am in receipt of the subject referenced permit application. I will need the following items for Public Notice.

1. A location map that clearly depicts the project limits.

2. 8.5 by 11 inch drawings showing the construction of the ponds and mitigation area and showing impacts to existing resources.

3. A more detailed project description stating why impacts must be incurred and whether wetland 1 will be impacted in any way.

4. A mitigation statement explaining how 1.77 acres of wetland impact will be adequately mitigated.

Please submit this information in order to continue the 404 review process.

Thank you,

Tyler J. Bintrim
Regulatory Project Manager
U.S. Army Corps of Engineers Pittsburgh District Federal Building, 20th Floor
1000 Liberty Avenue Pittsburgh, PA 15222

P: 412-395-7115

# Module 14: Streams/Wetlands
# Unnamed Tributary #1 to Black Run

### *14.1 Mining Activities Within 100 Feet of a Stream*

*If the mining activities, including haul road crossings, are proposed within 100 feet of an intermittent or perennial stream provide the following information: (**Note**: Variance request for the expansion of pits must be included in the proof of publication. A separate Module 14.1 should generally be completed for each proposed encroachment.)*

a) *Name and location of the stream; and location, length, and acreage disturbed by the proposed activities (Identify the location of the proposed activities on Exhibits 9 and 18);*

No direct impacts to the perennial Unnamed Tributary (UNT) #1 to Black Run are anticipated as a result of mining activities. However, encroachment is proposed within the 100' stream barrier of the stream. This stream is located along the western portion of the proposed permit area and to some extent parallels Mt Union Road (T-861). This stream section isolates the northwest corner of the permit area from the main project area. An encroachment up to 50 feet from the tributary is requested for support activities including the construction of a berm to act as an Erosion and Sedimentation Control Structure. The final Polishing Pond (Pond 5) is also proposed to be placed within the 100' barrier. This pond will act as the re-charge pond for the plant operations as well as an upslope sediment pond for the site.

*A narrative giving a description and the purpose and justification of the proposed activities;*

A 50' stream barrier is proposed to accommodate support activities which will enable a safer and more efficient working environment. Current operational area limitations reduce the area for potential support activities such as the processing plant and processing ponds. Preparation for a portion of the processing area will require the removal of some raw material from within the mining limits. To minimize the stockpiling and re-handling of this material, maximum usage of the area outside the mining limits is requested. No mineral removal is proposed within 100' of this tributary.

b) *A hydrologic and hydraulic analysis which shall include: data on size, shape and characteristics of the watershed; the size and frequency of the design storm; the hydraulic capacity of any structures; the hydraulic capacity of the channel upstream and downstream; and, where flooding is a problem, flood damage and backwater analysis;*

At the downstream end of the encroachment area, the watershed drainage area is approximately 105 acres and is comprised of a combination of cropland and non-commercial forestland. This area is currently fully vegetated and has an average slope of approximately 10%. Streambed slope within the variance area is approximately 4%.

Using a CN value of 65, the following storm data has been generated:

| | |
|---|---|
| $P_2$ = 2.6" | $Q_2$ = 15 cfs |
| $P_{10}$ = 3.8" | $Q_{10}$ = 57 cfs |
| $P_{25}$ = 4.3" | $Q_{25}$ = 85 cfs |
| $P_{50}$ = 4.8" | $Q_{50}$ = 112 cfs |

Since no structures or activities are proposed within the stream channel, hydraulic capacities and backwater analysis are not necessary.

c) *A description of the character of the stream bed and banks, and a profile of the stream for a reasonable distance above and below the proposed site showing bed slopes, normal and flood water surfaces; and a description of the riparian vegetation;*

The stream bottom material consists of primarily sand, silt, and gravel cobbles, with a bed slope of approximately 4%. This stream is linear with few bends to slow discharge. The upper end of this stream encroachment is marked by the outfall of a 24" CMP, which crosses Mt. Union Road. Based on the size of this existing culvert, significant flows to cause flooding do not visually appear to occur regularly. Stream banks composed of silts and sand are stabilized by streamside vegetation. Riparian vegetation consists of Multi Floral Rose, Jewelweed, Skunk Cabbage, scrub brush, and young mixed deciduous trees. Please see attached detail for plan view and cross sections with channel capacities.

d) *A plan and typical cross-sections showing stream channel and existing ground, activities proposed, barriers to be maintained, and normal and flood water surfaces;*

Please see attached detail, including sections D-F

e) *Where a bridge, culvert or other water obstruction is proposed, provide the following information:*

No water obstructions are proposed within this variance request.

1) *Plans and details showing the location, type, size, and height of the structure;*

2) *Calculations showing the hydraulic capacity of the structure;*

3) *A profile of the streambed for a reasonable distance above and below the proposed location showing normal and flood water surface elevations and backwater effects of the structure;*

4) *Cross-sections upstream, downstream, and at the proposed location of the structure showing normal and flood water surface elevations and other topographic features, elevations, etc., necessary for an appraisal of the hazard potential of the structure;*

5) *A narrative description of the construction methods and sequence including water handling during construction, and erosion and sedimentation controls;*

6) *Indicate if the structure will be temporary or permanent (include plans for removal of temporary structures).*

g) *A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code Chapter 93 Protected Water Use Classification.*

***(Note:** General Permit (BMR-GP-102) is available for construction of access roads.)*

Unnamed tributary #1 to Black Run is classified as CWF, by Chapter 93 designation of Slippery Rock Creek. There are no designated downstream uses. Water quantity and quality are sufficient to sustain aquatic invertebrates. Upstream farming and timbering practices have been observed to temporarily affect turbidity within this stream. Otherwise, laboratory analysis indicate no water quality concerns.

### *14.2 Stream Relocation and Channel Changes* Does Not Apply

*If the proposed mining activities involve a relocation or channel change of an intermittent or perennial stream provide the following information (**Note**: Stream variance request must be included in the proof of publication):*

*a) Name and location of stream and location and length of the proposed channel change (identify the location of the proposed activities on Exhibits 9 and 18);*

*b) A narrative giving a description and the purpose and justification of the proposed relocation or channel change;*

*c) A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code, Chapter 93 Protected Water Use Classification;*

*d) A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities. Provide the name(s), address(es) and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data;*

*e) A hydrologic and hydraulic analysis which includes;*

1) Data on size, shape and characteristics of the watershed;
2) The size and frequency of the design storm;
3) The hydraulic capacity of the proposed replacement channel;
4) The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.

*f) A stream profile for the existing and proposed channel for a reasonable distance upstream, downstream and within the proposed change, showing bed slopes, pool-riffle ratios, normal and flood water surfaces, and existing obstructions;*

*g) A detailed plan and cross-sections of the existing and proposed channel upstream, downstream and within the proposed channel change showing the limits and configuration of the proposed activities, dimensions, channel linings, and normal and flood water surfaces;*

*h) A description of the construction methods and sequence including: water handling during construction, erosion and sedimentation controls, and measures to be taken to prevent adverse impacts to water quality and quantity, water users and the aquatic communities.*

# Module 14: Streams/Wetlands
# Unnamed Tributary #3 to Black Run

### *14.1 Mining Activities Within 100 Feet of a Stream*

*If the mining activities, including haul road crossings, are proposed within 100 feet of an intermittent or perennial stream provide the following information: (**Note**: Variance request for the expansion of pits must be included in the proof of publication. A separate Module 14.1 should generally be completed for each proposed encroachment.)*

a) *Name and location of the stream; and location, length, and acreage disturbed by the proposed activities (Identify the location of the proposed activities on Exhibits 9 and 18);*

The proposed location of Pond 4 upstream from the confluence of Unnamed Tributary (UNT) #1 to Black Run will require approximately 190 linear feet of impacts to UNT #3 to Black Run. In addition, Pond 5 will be located within the 100' barrier to UNT #3, but will not directly impact the stream.

b) *A narrative giving a description and the purpose and justification of the proposed activities;*

Placement of Pond 5 (Polishing Pond) is required due to the plant location and support site constraints. The placement of Process Pond 4 in the headwaters of the stream is also required due to the site constraints and the elimination of a small wetland complex. (Please see below).

c) *A hydrologic and hydraulic analysis which shall include: data on size, shape and characteristics of the watershed; the size and frequency of the design storm; the hydraulic capacity of any structures; the hydraulic capacity of the channel upstream and downstream; and, where flooding is a problem, flood damage and backwater analysis;*

The current watershed drainage area for the proposed stream crossing is 30 acres, which is comprised of primarily cropland. This area is currently fully vegetated and has an average slope of approximately 10%. Streambed slope within the variance area is approximately 2%.
Using a CN value of 65, the following storm data has been generated:

| | |
|---|---|
| $P_2$ = 2.6" | $Q_2$ = 6.5cfs |
| $P_{10}$ = 3.8" | $Q_{10}$ = 24 cfs |
| $P_{25}$ = 4.3" | $Q_{25}$ = 35 cfs |
| $P_{50}$ = 4.8" | $Q_{50}$ = 46 cfs |

During the mining activities at the site, the wetland recharge area will be eliminated and installation of the process ponds will effectively reduce the stream channel to an ephemeral classification, flowing only in response to storm events.

d) *A description of the character of the stream bed and banks, and a profile of the stream for a reasonable distance above and below the proposed site showing bed slopes, normal and flood water surfaces; and a description of the riparian vegetation;*

The stream bottom material consists of primarily sand, silt, and gravel, with a bed slope of approximately 2%. This drainageway appears to have been manipulated (mechanically dug drainage ditch) at some point, as the cross sectional area of the channel is consistent along the entire length from the wetland source to UNT #1. Riparian vegetation consists of goldenrod, vines, briars, scrub brush, and young mixed deciduous trees. Please see attached detail for plan view and cross sections with channel capacities.

*A plan and typical cross-sections showing stream channel and existing ground, activities proposed, barriers to be maintained, and normal and flood water surfaces;*

Please see attached detail, including cross sections and profiles for both the stream crossing and the pond installation.

f) *Where a bridge, culvert or other water obstruction is proposed, provide the following information:*

1) *Plans and details showing the location, type, size, and height of the structure;*

Please see attached exhibit sheets submitted as part of the permit application.

2) *Calculations showing the hydraulic capacity of the structure;*

The hydrologic calculations for the Process Ponds and Polishing Pond are found in Module 13. There will be no direct discharge to the stream from the ponds unless the emergency spillways are activated during high flow

events.

3) *A profile of the streambed for a reasonable distance above and below the proposed location showing normal and flood water surface elevations and backwater effects of the structure;*

Cross-section A-A' is provided for Pond 5 (Polishing Pond). Cross-sections and a profile are provided for the Process Ponds 3 and 4.

4) *Cross-sections upstream, downstream, and at the proposed location of the structure showing normal and flood water surface elevations and other topographic features, elevations, etc., necessary for an appraisal of the hazard potential of the structure;*

Please see attached detail

5) *A narrative description of the construction methods and sequence including water handling during construction, and erosion and sedimentation controls;*

Erosion and sedimentation controls will consist of both permanent and temporary measures. Initial construction will not begin until all necessary materials have been assembled at the site and at a time of low stream flow. Staked filter fencing will be placed downslope of the construction area prior to the initiation of any earth moving activities. The filter fencing will remain in place until all areas of disturbance have been stabilized by either rock cover or the establishment of a permanent vegetative cover.

After the embankments have been built, they will be seeded and mulched immediately as outlined in Module 23 of this application. The silt fencing will remain in place until the embankments have been stabilized by a minimum 70% permanent cover.

6) *Indicate if the structure will be temporary or permanent (include plans for removal of temporary structures).*

The ponds will remain as part of the post mining land use once the mining has been completed.

g) *A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code Chapter 93 Protected Water Use Classification.*

***(Note:** General Permit (BMR-GP-102) is available for construction of access roads.)*

UNT #3 to Black Run is classified as CWF, by Chapter 93 designation of Slippery Rock Creek. There are no designated downstream uses. Under seasonal conditions, the volume of water within this channel is minimal to non-existent. Only after periods of substantial precipitation does this channel convey surface water readily. Water quality is characteristic of wetland drainage.

### *14.2 Stream Relocation and Channel Changes*

Not applicable

*If the proposed mining activities involve a relocation or channel change of an intermittent or perennial stream provide the following information (**Note**: Stream variance request must be included in the proof of publication):*

*a) Name and location of stream and location and length of the proposed channel change (identify the location of the proposed activities on Exhibits 9 and 18);*

*b) A narrative giving a description and the purpose and justification of the proposed relocation or channel change;*

*c) A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code, Chapter 93 Protected Water Use Classification;*

*d) A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities. Provide the name(s), address(es) and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data;*

*e) A hydrologic and hydraulic analysis which includes;*

1) Data on size, shape and characteristics of the watershed;
2) The size and frequency of the design storm;
3) The hydraulic capacity of the proposed replacement channel;
4) The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.

*f) A stream profile for the existing and proposed channel for a reasonable distance upstream, downstream and within the proposed change, showing bed slopes, pool-riffle ratios, normal and flood water surfaces, and existing obstructions;*

*g) A detailed plan and cross-sections of the existing and proposed channel upstream, downstream and within the proposed channel change showing the limits and configuration of the proposed activities, dimensions, channel linings, and normal and flood water surfaces;*

*h) A description of the construction methods and sequence including: water handling during construction, erosion and sedimentation controls, and measures to be taken to prevent adverse impacts to water quality and quantity, water users and the aquatic communities.*

# Module 14: Streams/Wetlands
# North of West Liberty Road
## Wetland No. 1

### *14.3 Wetland Related Information*

a) *Provide the name(s), address(es), telephone number(s) and qualifications of the person(s) who made the determination if wetlands exist within the proposed permit area.*

**Derwood B. Davis (Biologist), The EADS Group, Inc., 15392 Rt 322, Clarion, PA 16214**

b) *Show the location of wetlands on Exhibits 6.2, 9 and 18.*

**Wetlands have been identified on the exhibit maps (Attached).**

c) What is the total wetland acreage (which will be affected) for the proposed permit area? **0** acres.

d) *Provide responses to the following for each wetland which will be affected by the proposed mining activities:*

*Exceptional Value Wetland Characteristics*

1) *Does the wetland serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?* ☐ yes ☒ no

2) *Is the wetland hydrologically connected to or located within 1/2 mile of the wetlands identified in d)1) and does it maintain the habitat of the "threatened" or "endangered" species within the wetlands identified in d)1) above)?* ☐ yes ☒ no

***NOTE:*** *If this wetland is located more than 1000 feet from the permit area, show its location (and the location of the wetland that is hydrologically connected to or located within ½ mile of) on the Exhibit 6.1 Map.*

3) *Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream?* ☐ yes ☒ no

4) *Is the wetland located in or along the floodplain of a stream listed as exceptional value (under 25 Pa Code Chapter 93) or the floodplain of a tributary to an exceptional value stream?* ☐ yes ☒ no

5) *Is the wetland within the corridor of a waterway which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act?* ☐ yes ☒ no

6) *Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply?* ☐ yes ☒ no

7) *Is the wetland located in areas designated by the Department as "natural" or "wild" areas within state forest or park lands?* ☐ yes ☒ no

8) *Is the wetland located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?* ☐ yes ☒ no

9) *Is the wetland located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935?* ☐ yes ☒ no

***NOTE:*** *If a "yes" response is indicated for any question in d)1) through d)9), the wetlands would be "exceptional value" (as defined in 25 Pa Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25 Pa Code Section 105.18(a) have been met.*

*Wetland Functions*

| | | | |
|---|---|---|---|
| 10) | *Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, or resting sites for aquatic or land species?* | ☒ yes | ☐ no |
| 11) | *Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?* **Slippery Rock University uses this site.** | ☒ yes | ☐ no |
| 12) | *Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns or other environmental characteristics?* | ☒ yes | ☐ no |
| 13) | *Does the wetland serve as storage areas for flood and storm waters, or does it shield other areas from erosion or storm damage?* | ☒ yes | ☐ no |
| 14) | *Does the wetland provide a groundwater recharge area that maintains minimum baseflows?* **This wetland is supported by spring outcrops from a perched water table; providing baseflow to an unnamed tributary.** | ☒ yes | ☐ no |
| 15) | *Does the wetland serve as a prime natural recharge area where surface water and groundwater are directly connected?* | ☒ yes | ☐ no |
| 16) | *Does the wetland aid in the prevention of pollution?* **This wetland has the potential however, significant pollutant sources are lacking within the upstream area.** | ☒ yes | ☐ no |
| 17) | *Is the wetland used for, or does it provide the opportunity to be used for recreation?* **This wetland is not open to the public.** | ☐ yes | ☒ no |

e) *If a "yes" response is indicated for the question in d)1) or d)2), identify how the determination was made and indicate any contacts with state or federal agency personnel.*

### *14.4 Wetland Impact Analysis/Assessment*

**This Wetland Community will not be permanently impacted by the proposed mining.**

a) *Describe the alternatives to the proposed mining activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (e.g. relocating spoil/topsoil storage areas, rerouting haul roads).*

b) *Discuss whether any of the alternatives are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites which would not affect the wetlands.*

c) *If any wetlands within the proposed permit area will be directly affected, provide the following:*

1) *Identify and delineate the wetland and the areal extent of the impact (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and delineation of wetlands – statement of policy).*

2) *Submit a cross-sectional view showing the wetland and the proposed mining area.*

3) *Explain how the proposed mining activities will directly affect the wetlands.*

aa) *If the proposed mining activities will affect less than 1.0 acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 Pa Code Section 105.17), provide a description of the wetland functions which will be impacted by the proposed mining activities.* ***Note:*** *If a "yes" response is indicated for any question in Module 14.3 d)1) through d)9), the wetlands would be exceptional value (as defined in Section 105.17).*

bb) *If the proposed mining activities will affect 1.0 or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions identified in Module 14.3 d)10) through d)17).*

d) *If any wetlands within the proposed permit or adjacent area will be indirectly affected (e.g. altering the wetland hydrology), provide the following:*

1) *Identify and delineate the wetland and provide an estimate of the total wetland acreage affected (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and Delineation of Wetlands – statement of policy).*

2) *A description of how the proposed mining activities will indirectly affect the wetlands.*

e) *Will the cumulative impact of the proposed and anticipated mining activities result in a major impairment of the wetland resource in the general area?* ☐ yes ☐ no

*Provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.*

## *14.5 Wetland Mitigation/Replacement*

**This wetland community will not be affected. Therefore, no mitigation is required.**

***Note:*** *If a total of one-half (.5) acres or less of wetlands will be affected, participation in Pennsylvania's Wetlands Replacement Project may be authorized by the Department in lieu of onsite replacement of the wetlands.*

a) *If wetland mitigation measures or wetland replacement are proposed, address the following:*

1) *Identify the wetlands where mitigation measures will be employed.*

2) *Identify the wetlands that will be replaced and the location of the replacement wetland site. Provide the number of acres for each wetland to be replaced and the acreage of the replacement wetland.*

3) *Provide a plan for mitigation/replacement following the guidelines in the Department's technical guidance titled*

*"Design Criteria - Wetlands Replacement Monitoring" document 363-0300-001. This guidance is available from the Division of Waterways, Wetlands and Erosion Control, Post Office Box 8854, Harrisburg, Pennsylvania 17105-8554 or through the Department's Web Site.*

*Show the location of replacement wetland sites on the Operations Map (Exhibit 9) and the Land Use and Reclamation Map (Exhibit 18).*

***Note:*** *At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres). The Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected. Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.*

# Module 14: Streams/Wetlands
## South of West Liberty Road
### Wetland No. 4 (Temporary Impacts)

***14.3 Wetland Related Information***

a) *Provide the name(s), address(es), telephone number(s) and qualifications of the person(s) who made the determination if wetlands exist within the proposed permit area.*

**Derwood B. Davis (Biologist), The EADS Group, Inc., 15392 Rt 322, Clarion, PA 16214**

b) *Show the location of wetlands on Exhibits 6.2, 9 and 18.*

**Wetlands have been identified on the exhibit maps**

c) What is the total wetland acreage (which will be affected) for the proposed permit area? **0.01** acres.

d) *Provide responses to the following for each wetland which will be affected by the proposed mining activities:*

*Exceptional Value Wetland Characteristics*

1) *Does the wetland serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?* ☐ yes ☒ no

2) *Is the wetland hydrologically connected to or located within 1/2 mile of the wetlands identified in d)1) and does it maintain the habitat of the "threatened" or "endangered" species within the wetlands identified in d)1) above)?* ☐ yes ☒ no

***NOTE:*** *If this wetland is located more than 1000 feet from the permit area, show its location (and the location of the wetland that is hydrologically connected to or located within ½ mile of) on the Exhibit 6.1 Map.*

3) *Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream?* ☐ yes ☒ no

4) *Is the wetland located in or along the floodplain of a stream listed as exceptional value (under 25 Pa Code Chapter 93) or the floodplain of a tributary to an exceptional value stream?* ☐ yes ☒ no

5) *Is the wetland within the corridor of a waterway which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act?* ☐ yes ☒ no

6) *Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply?* ☐ yes ☒ no

7) *Is the wetland located in areas designated by the Department as "natural" or "wild" areas within state forest or park lands?* ☐ yes ☒ no

8) *Is the wetland located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?* ☐ yes ☒ no

9) *Is the wetland located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935?* ☐ yes ☒ no

***NOTE:*** *If a "yes" response is indicated for any question in d)1) through d)9), the wetlands would be "exceptional value" (as defined in 25 Pa Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25*

*Pa Code Section 105.18(a) have been met.*

*Wetland Functions*

| | | | |
|---|---|---|---|
| 10) | *Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, or resting sites for aquatic or land species?* **This wetland community would provide some food chain production and general habitat for terrestrial and semi-aquatic species only.** | ☒ yes | ☐ no |
| 11) | *Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?* **This wetland is on private property and is not designated for study or resource protection.** | ☐ yes | ☒ no |
| 12) | *Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns or other environmental characteristics?* **This wetland provides some natural drainage of surface and ground waters to a tributary that establishes local surface water flow patterns.** | ☒ yes | ☐ no |
| 13) | *Does the wetland serve as storage areas for flood and storm waters, or does it shield other areas from erosion or storm damage?* **This wetland is located adjacent to UNT #1.** | ☒ yes | ☐ no |
| 14) | *Does the wetland provide a groundwater recharge area that maintains minimum baseflows?* **This wetland is supported by periodic flooding of UNT #1 and does not likely contribute to baseflow.** | ☐ yes | ☒ no |
| 15) | *Does the wetland serve as a prime natural recharge area where surface water and groundwater are directly connected?* **This wetland is supported by a high groundwater table provides recharge functions.** | ☒ yes | ☐ no |
| 16) | *Does the wetland aid in the prevention of pollution?* **This wetland has the Potential, however significant pollutant sources are lacking within the upstream area.** | ☒ yes | ☐ no |
| 17) | *Is the wetland used for, or does it provide the opportunity to be used for recreation?* **This wetland is located on private property and is not open to the general public.** | ☐ yes | ☒ no |

e) *If a "yes" response is indicated for the question in d)1) or d)2), identify how the determination was made and indicate any contacts with state or federal agency personnel.*

### *14.4 Wetland Impact Analysis/Assessment*

a) *Describe the alternatives to the proposed mining activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (e.g. relocating spoil/topsoil storage areas, rerouting haul roads).*

**These impacts are a result of temporary impacts from the construction of a 4 inch Schedule 40 PVC sanitary pipeline. Alternatives considered were No Build, Alignment Avoiding Wetland No. 4 and Alignment With Minimal Impact To Wetland No. 4.**

b) *Discuss whether any of the alternatives are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites which would not affect the wetlands.*

**The No Build Alternative is a feasible alternative but was considered not prudent. Due to the length of time that the plant will be operating and the number of full time employee's onsite, a sanitary onsite septic system was warranted; not to mention required by the PA DEP.**

**The sewer line alignment avoiding impacts to Wetland No. 4 was not a feasible alternative after considering**

**design standards, slope requirements and site development barriers. The stream crossing site was selected based on the shallower water depth, drainage area, required slope standards for sanitary pipelines and the ability to achieve a minimum of 3 feet of cover over the stream crossing. Design parameters for gravity flow sanitary pipelines require a minimum of a 1 percent slope and the sanitary pipeline between the septic and dosing tanks must be at a minimum of a 2 percent slope. The need to maintain a minimum 2 percent slope between the septic and dosing tanks required both tanks to be located on the west side of the stream, since the natural grade on the east side of the stream was too flat. Other stream crossing locations that would not impact Wetland No. 4 would not maintain the required slopes for gravity flow sanitary lines.**

**The sewer line alignment with minimal impact alternative was considered feasible and prudent based on meeting the required minimum of 3 feet of covering at the wetland and stream crossing, required slopes for sanitary line construction, the depth of water in the stream and the location of the sediment pond. The first alternative was located approximately 25 linear feet to the north of the current proposed crossing. Upon initial wetland investigation, this alternative resulted in 0.03 acre of temporary wetland impact as well as a stream crossing. The location was shifted south reducing temporary wetland impacts by crossing at a more narrow point within the wetland community resulting in 0.01 acre of temporary impact. This alternative achieves the goals and objectives of Glacial Sand & Gravel and the PA DEP with minimal environmental impacts to this wetland community that are temporary and can be mitigated through restoration methods.**

c) *If any wetlands within the proposed permit area will be directly affected, provide the following:*

1) *Identify and delineate the wetland and the areal extent of the impact (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and delineation of wetlands – statement of policy).*

**The affected wetlands are shown on the attached site plan. The aerial extent of temporary wetland impacts by the construction of this sanitary line is 0.01 acres.**

2) *Submit a cross-sectional view showing the wetland and the proposed mining area.*

**Cross sections of this wetland community and the sanitary line crossing are attached.**

3) *Explain how the proposed mining activities will directly affect the wetlands.*

**The construction of this sanitary line will directly affect this wetland community by excavation, backfilling and grading as part of standard pipeline construction methods.**

aa) *If the proposed mining activities will affect less than 1.0 acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 Pa Code Section 105.17), provide a description of the wetland functions which will be impacted by the proposed mining activities.* ***Note:*** *If a "yes" response is indicated for any question in Module 14.3 d)1) through d)9), the wetlands would be exceptional value (as defined in Section 105.17).*

bb) *If the proposed mining activities will affect 1.0 or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions identified in Module 14.3 d)10) through d)17).*

**Plant accumulation and decomposition occurring within this wetland community would be broken down into organic and inorganic nutrients. The affected wetland would provide carbon and other inorganic nutrients to the unnamed tributary immediately adjacent to as well as downstream reaches. The affected wetland provides general habitat for terrestrial and semi-aquatic organisms. This community would provide food and cover for these organisms during most of the year. Aquatic habitat is not provided due to the lack of open water habitat for a sufficient time during the growing season. Pollution prevention would be moderately exhibited by the affected wetland however, the well defined outlet, lack of significant open water, low vegetation/water interfacing, and lack of potential pollution sources upslope of the wetland reduces the opportunity for this wetland community to fully exhibit this function.**

d) *If any wetlands within the proposed permit or adjacent area will be indirectly affected (e.g. altering the wetland hydrology), provide the following:*

**No other wetland communities will be indirectly affected by the proposed sanitary line construction.**

1) *Identify and delineate the wetland and provide an estimate of the total wetland acreage affected (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and Delineation of Wetlands – statement of policy).*

2) *A description of how the proposed mining activities will indirectly affect the wetlands.*

e) *Will the cumulative impact of the proposed and anticipated mining activities result in a major impairment of the wetland resource in the general area?* ☐ yes ☒ no

*Provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.*

**The affected wetland community is a small to medium-sized, perched, wetland community providing functions at various levels. Impacts to these wetlands are site specific and temporary in nature and will not result in cumulative impacts to wetland resources in the surrounding area.**

### *14.5 Wetland Mitigation/Replacement*

***Note:*** *If a total of one-half (.5) acres or less of wetlands will be affected, participation in Pennsylvania's Wetlands Replacement Project may be authorized by the Department in lieu of onsite replacement of the wetlands.*

a) *If wetland mitigation measures or wetland replacement are proposed, address the following:*

1) *Identify the wetlands where mitigation measures will be employed.*

**Wetland restoration measures will be completed in-kind as part of the trench backfill procedures.**

2) *Identify the wetlands that will be replaced and the location of the replacement wetland site. Provide the number of acres for each wetland to be replaced and the acreage of the replacement wetland.*

**The wetland community to be restored is classified as a Palustrine, Scrub Shrub, Broad-leaved Deciduous community that is located within the upper reach of an unnamed tributary to Black Run. This wetland community will be restored onsite within the watershed of the UNT #1 to Black Run. The affected wetland acreage and the restored acreage was calculated to be 0.01 acres.**

3) *Provide a plan for mitigation/replacement following the guidelines in the Department's technical guidance titled "Design Criteria - Wetlands Replacement Monitoring" document 363-0300-001. This guidance is available from the Division of Waterways, Wetlands and Erosion Control, Post Office Box 8854, Harrisburg, Pennsylvania 17105-8554 or through the Department's Web Site.*

**The wetland restoration plan proposes to restore the affected wetlands at a 1:1 ratio.**

**The wetland functions and values identified to be present within the affected wetland will be restored equally as a result of the proposed restoration plan based on being able to restore the affected area within the actual affected area and Black Run watershed.**

**The restoration plan will initially consist of a Palustrine, Persistent, Emergent wetland community, succeeding into a Scrub Shrub, Broadleaved Deciduous wetland community supported by a soil saturated and seasonally flooded hydrological regime.**

**Inundated and soil saturated conditions are expected to occur throughout the growing season above the surface to one (1) foot below the surface based on the existing data gathered during the delineation of the wetland community.**

**Soil conservation measures will be used to restore the hydric soils within the affected wetlands. The top 12 inches of soil within the affected wetlands will be excavated and stockpiled as necessary until the**

bedding and placement of the pipe is completed. This stockpile will be covered with a tarp(s) to reduce evaporation and maintain moisture within the soil. Upon completion of the bedding and placement of the pipe, the trench will backfilled to within a foot below the surface. The hydric soil will be placed within this portion of the trench and brought to the existing grade. At a minimum, this soil will act as a planting medium for the specified seed mix. However, this soil will contain a seed bank of indigenous hydrophytic plant species that, if properly stored and placed, will likely germinate and proliferate within the existing wetland community.

Once the trench has been graded to the existing contour, it will be seeded with Wildlife Food and Shelter Shrub Mix (ERNMX-138) at a rate of 15 lbs per acre. The ERNMX-138 is composed of Fox sedge, *Carex vulpinoidea* (24%); Arrow wood, *Viburnum dentatum* (14%); Virginia wild rye, *Elymus virginicus* (11%); Lurid sedge, *Carex lurida* (10%); Silky dogwood, *Cornus amomum* (10%); Grey dogwood, *Cornus racemosa* (10%); Hop sedge, *Carex lupulina* (5%); Blunt broom sedge, *Carex scoparia* (7%); Hercules' club, *Aralia spinosa* (3%); Awl sedge, *Carex stipata* (2%); Cosmos bristly sedge, *Carex comosa* (1%); Buttonbush, *Cephalanthus occidentalis* (2%); and Meadow sweet, *Spiraea alba* (1%). As an E & S control crop the restored site will be seeded with Annual ryegrass, *Lolium multiflorum* at a rate of 15 lbs per acre.

Plants and seed can be obtained from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA, 16335, 800-873-3321 or www.ernstseed.com. Seed will be mechanically broadcasted on the restored site and the anticipated survival rate and percent aerial cover is expected to be between 90 and 100 percent after one (1) full growing season. The percent aerial cover at three (3) years of maturity is expected to be 100 percent and consisting of hydrophytic plant species.

Restoration of the wetland community shall begin immediately upon completion of the bedding and placement of the pipe. It is anticipated that upon beginning site reclamation activities, restoration measures will be completed the same day. Within one (1) year after the affected wetland community is restored it is expected to function in full capacity for drainage and flow patterns, stormwater retention, sediment stabilization and surface water discharge. Biological functions such as food chain production, aquatic and terrestrial habitat, nesting, spawning, and resting sites will increase as the restored area matures and vegetation composition stabilizes. Natural filtration and pollution prevention functions will be partially exhibited in varying degrees and will increase in their representation and function as the restored area matures as well. All wetland functions that occurred within the affected wetlands will be fully exhibited and functional within the restored area at the end of three (3) full growing seasons.

*Show the location of replacement wetland sites on the Operations Map (Exhibit 9) and the Land Use and Reclamation Map (Exhibit 18).*

***Note:*** *At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres). The Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected. Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.*

# Module 14: Streams/Wetlands
## South of West Liberty Road
### Wetlands No. 2, 3 and 4

***14.3 Wetland Related Information***

a) *Provide the name(s), address(es), telephone number(s) and qualifications of the person(s) who made the determination if wetlands exist within the proposed permit area.*

**Derwood B. Davis (Biologist), The EADS Group, Inc., 15392 Rt 322, Clarion, PA 16214**

b) *Show the location of wetlands on Exhibits 6.2, 9 and 18.*

**Wetlands have been identified on the exhibit maps (Attached).**

c) What is the total wetland acreage (which will be affected) for the proposed permit area? **1.89** acres.

d) *Provide responses to the following for each wetland which will be affected by the proposed mining activities:*

*Exceptional Value Wetland Characteristics*

1) *Does the wetland serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?* ☐ yes ☒ no

2) *Is the wetland hydrologically connected to or located within 1/2 mile of the wetlands identified in d)1) and does it maintain the habitat of the "threatened" or "endangered" species within the wetlands identified in d)1) above)?* ☐ yes ☒ no

***NOTE:*** *If this wetland is located more than 1000 feet from the permit area, show its location (and the location of the wetland that is hydrologically connected to or located within ½ mile of) on the Exhibit 6.1 Map.*

3) *Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream?* ☐ yes ☒ no

4) *Is the wetland located in or along the floodplain of a stream listed as exceptional value (under 25 Pa Code Chapter 93) or the floodplain of a tributary to an exceptional value stream?* ☐ yes ☒ no

5) *Is the wetland within the corridor of a waterway which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act?* ☐ yes ☒ no

6) *Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply?* ☐ yes ☒ no

7) *Is the wetland located in areas designated by the Department as "natural" or "wild" areas within state forest or park lands?* ☐ yes ☒ no

8) *Is the wetland located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?* ☐ yes ☒ no

9) *Is the wetland located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935?* ☐ yes ☒ no

***NOTE:*** *If a "yes" response is indicated for any question in d)1) through d)9), the wetlands would be "exceptional value" (as defined in 25 Pa Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25*

*Pa Code Section 105.18(a) have been met.*

*Wetland Functions*

| | | | |
|---|---|---|---|
| 10) | *Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, or resting sites for aquatic or land species?* **These wetland communities would provide some food chain production and general habitat for terrestrial and semi-aquatic species only.** | ☒ yes | ☐ no |
| 11) | *Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?* **These wetlands are on private property and are not designated for study or resource protection.** | ☐ yes | ☒ no |
| 12) | *Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns or other environmental characteristics?* **These wetlands do provide some natural drainage of surface and ground waters to a tributary that establishes local surface water flow patterns.** | ☒ yes | ☐ no |
| 13) | *Does the wetland serve as storage areas for flood and storm waters, or does it shield other areas from erosion or storm damage?* **These wetlands contain a moderate grade to the northwest and a defined outlet that discharges water to tributaries. They are not part of a major waterway that floods.** | ☐ yes | ☒ no |
| 14) | *Does the wetland provide a groundwater recharge area that maintains minimum baseflows?* **These wetlands are supported by spring outcrops from a perched water table; providing baseflow to an unnamed tributary.** | ☒ yes | ☐ no |
| 15) | *Does the wetland serve as a prime natural recharge area where surface water and groundwater are directly connected?* **These wetlands contain a defined outlet and are supported by spring outcrops.** | ☒ yes | ☐ no |
| 16) | *Does the wetland aid in the prevention of pollution?* **These wetlands have the potential however, significant pollutant sources are lacking within the upstream area.** | ☒ yes | ☐ no |
| 17) | *Is the wetland used for, or does it provide the opportunity to be used for recreation?* **These wetlands are located on private property and are not open to the general public.** | ☐ yes | ☒ no |

e) *If a "yes" response is indicated for the question in d)1) or d)2), identify how the determination was made and indicate any contacts with state or federal agency personnel.*

### *14.4 Wetland Impact Analysis/Assessment*

a) *Describe the alternatives to the proposed mining activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (e.g. relocating spoil/topsoil storage areas, rerouting haul roads).*

**Alternatives considered as part of this permit were: No Mining, Mining with Wetland Avoidance and Mining with Wetland Impacts.**

b) *Discuss whether any of the alternatives are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites which would not affect the wetlands.*

**The No Mining Alternative is a feasible alternative but was considered not prudent due to the fact that Glacial Sand & Gravel currently owns the permit area and this alternative would not permit them to regain their investment and continue to provide aggregate products to a highly demanding market. Mining with Wetland Avoidance is not considered feasible or prudent due to the required area for constructing a processing plant,**

the required area to construct sufficient wash water storage ponds to supply the processing plant and the inability to fit these required areas within an area that does not hinder the extraction of aggregate material and at the same time prevent wetland impacts. The location of the processing plant and storage ponds are located in an area that contains lower volumes of aggregate material in comparison to the rest of the permit area. The location of the storage ponds is such that permits the collection of as much surface water runoff as possible. Likewise, this area is selected for the construction of the processing plant and wash water ponds because it will not interfere with the extraction of aggregate material that economically supports the mobilization of mining equipment and the actual mining activity.

Re-locating the processing plant and wash water ponds in order to avoid impacting the wetland was evaluated and considered not feasible or prudent based on the following reasons: 1) Re-location of the wash water storage ponds would require shifting the location of the processing plant in order to fit both operations within this area of the permit. This results in an economical loss of aggregate material that could be mined during the proposed mining phases and 2) Construction of the processing plant and wash water ponds in order to not interfere with the extraction of marketable aggregate would need to be done within the upslope areas of the wetlands. Field observations of the hydrological regime that supports this wetland community indicates this wetland is supported predominantly by a perched water table that outcrops in several places along the upper boundary line of the wetland community.

This consensus is supported by the observation of the drying up of these springs and lack of visible water within the wetland community during the spring and summer of 2007. Test hole and monitoring well information upslope of the wetland community reveals there are varying clay and silty clay layers immediately below the surface and ground water elevations were recorded to be at elevations from 1,216 to 1,218. The surface elevation within the wetland community ranges from 1,218 to 1,222. These impervious layers are believed to exist below the wetland community, and as a result, form a bowl whereby groundwater and surface water remains perched. Plant and wash water storage pond construction within the upslope area of the wetland community will negatively impact the wetland community due to: 1) diverting all surface water runoff around the processing plant to the wash water storage ponds, likewise around the wetland community as well and 2) Excavation into the hillside to construct the subgrade for the processing plant and wash water storage ponds will break these clay barriers and intercept the shallow ground water table lying below. This would have a negative impact on the wetland community downgrade by intercepting and redirecting the predominant hydrology that supports this wetland.

Wetland avoidance was also evaluated with a sub-alternative that eliminated the collection of surface water runoff and the construction of wash water storage ponds. This alternative depends solely on well water to provide the required wash water. This alternative would still have an indirect impact on the wetland community as well as a direct impact to surface water quality. The function of and need for wash water ponds is to: 1) recycle and store sufficient wash water from the processing plant that will conserve the use of and reduce the need for replacement water; 2) reduce the demand on groundwater resources from pumping water from wells to the processing plant and; 3) prevent sediment laden water from being discharged into adjoining tributaries. Construction of the processing plant will still result in the breaking up of the clay barrier that lies immediately underneath and the interruption of the shallow ground water table. This affect will again negatively impact the wetland community located downgrade. Providing the required water to operate the processing plant by using wells without recycling any wash water would likely result in a significant draw down of the ground water table. This again would negatively impact the wetland community. Sediment laden waters which would still require a detention basin to remove the sediment before discharging would potentially impact adjacent tributaries.

The Mining with Wetland Impacts alternative was considered feasible and prudent and reducing impacts to the wetland community is not feasible due to spatial constraints, already proposing the minimum wash water storage pond volume needed to support the processing plant and the unavoidable impact to the perched water table within the upstream area by plant construction. This alternative remains to be the alternative that achieves the goals and objectives of Glacial Sand & Gravel with the least environmental impact as a whole based on the following reasons: 1) It permits Glacial Sand & Gravel to streamline the mining process and extract the full intent of marketable aggregate within the permit area; 2) It provides the minimum required amount of wash water storage and recycling to support the processing plant therefore, reducing the draw on groundwater resources within and surrounding the permit area; 3) It provides a means to handle stormwater from the plant area and at the same time promotes water conservation as part of the plant operation; and 4) It provides detention time to settle out sediment and significantly reduces the need to discharge sediment laden waters to nearby tributaries.

c) *If any wetlands within the proposed permit area will be directly affected, provide the following:*

1) *Identify and delineate the wetland and the areal extent of the impact (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and delineation of wetlands – statement of policy).*

**The affected wetlands are shown on the attached site plan. The aerial extent of wetland impacts to these wetland communities by mining operations is 1.89 acres.**

2) *Submit a cross-sectional view showing the wetland and the proposed mining area.*

**Cross sections of these wetland communities and mining area are attached.**

3) *Explain how the proposed mining activities will directly affect the wetlands.*

**The mining activities will directly affect these wetland communities by excavation, fill placement and grading to construct a series of wash water storage ponds that have the capacity to store sufficient water for processing plant operations. These ponds will also have the capacity to retain water and settle out the sediment that will be suspended in the wash water.**

aa) *If the proposed mining activities will affect less than 1.0 acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 Pa Code Section 105.17), provide a description of the wetland functions which will be impacted by the proposed mining activities.* ***Note:*** *If a "yes" response is indicated for any question in Module 14.3 d)1) through d)9), the wetlands would be exceptional value (as defined in Section 105.17).*

bb) *If the proposed mining activities will affect 1.0 or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions identified in Module 14.3 d)10) through d)17).*

**Plant accumulation and decomposition occurring within these wetland communities would be broken down into organic and inorganic nutrients. The affected wetlands would provide carbon and other inorganic nutrients to the unnamed tributary immediately adjacent to as well as downstream reaches. The affected wetlands provide general habitat for terrestrial and semi-aquatic organisms. This community would provide food and cover for these organisms during most of the year. Aquatic habitat is not provided due to the lack of open water habitat for a sufficient time during the growing season. Pollution prevention would be moderately exhibited by the affected wetlands however, the well defined outlet, lack of significant open water, low vegetation/water interfacing, and lack of potential pollution sources upslope of these wetlands reduces the opportunity for these wetland communities to fully exhibit this function.**

d) *If any wetlands within the proposed permit or adjacent area will be indirectly affected (e.g. altering the wetland hydrology), provide the following:*

**No wetland areas will be indirectly affected by the proposed mining operation. However, Wetland No. 4 will be temporarily impacted by the proposed mining activity as a result of sanitary line construction (See attached Module 14 – Wetland No. 4 Temporary Impacts).**

1) *Identify and delineate the wetland and provide an estimate of the total wetland acreage affected (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and Delineation of Wetlands – statement of policy).*

2) *A description of how the proposed mining activities will indirectly affect the wetlands.*

e) *Will the cumulative impact of the proposed and anticipated mining activities result in a major impairment of the wetland resource in the general area?* ☐ yes ☒ no

*Provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.*

**The affected wetlands are small to medium-sized, perched, wetland communites providing some function and values at varying levels. Impacts to these wetlands are site specific and will not result in cumulative impacts to wetland resources in the surrounding area.**

### *14.5 Wetland Mitigation/Replacement*

***Note:*** *If a total of one-half (.5) acres or less of wetlands will be affected, participation in Pennsylvania's Wetlands Replacement Project may be authorized by the Department in lieu of onsite replacement of the wetlands.*

a) *If wetland mitigation measures or wetland replacement are proposed, address the following:*

1) *Identify the wetlands where mitigation measures will be employed.*

**Upon completion of the extraction of aggregate material located between West Liberty Road (T-860), Swope Road (T-382) and the large wetland community north and northeast of the permit area, the affected wetlands will be replaced as part of the reclamation of this immediate area. The Wetland Mitigation Plan can be found on the attached site plan and Cross Sections are included.**

2) *Identify the wetlands that will be replaced and the location of the replacement wetland site. Provide the number of acres for each wetland to be replaced and the acreage of the replacement wetland.*

**The wetlands that will be replaced are classified as a Palustrine, Persistent, Emergent and Scrub Shrub, Broad-leaved Deciduous communities that are located within the upper reach of an unnamed tributary to Black Run. The wetland replacement site is located across West Liberty Road within the watershed of Black Run. The affected wetland acreage is calculated to be 1.89 acres and the proposed replacement acreage is calculated to be 1.90 acres.**

3) *Provide a plan for mitigation/replacement following the guidelines in the Department's technical guidance titled "Design Criteria - Wetlands Replacement Monitoring" document 363-0300-001. This guidance is available from the Division of Waterways, Wetlands and Erosion Control, Post Office Box 8854, Harrisburg, Pennsylvania 17105-8554 or through the Department's Web Site.*

**As per PA DEP Technical Guidance Document 363-0300-001 the following information is being provided:**

**The wetland mitigation plan proposes to replace the affected wetlands at a 1:1 ratio.**

**The wetland functions and values identified to be present within the affected wetlands will be replaced equally and in some cases to a greater extent (i.e. food chain production, general habitat, food/cover/nesting) within the proposed replacement plan due to its immediate location to the large wetland area to the north and northwest and ability to function in conjunction with this wetland. As a result its location, design and concurrent functions, other functions such as aquatic habitat, natural water filtration and pollution prevention are expected to be enhanced.**

**Wetland replacement will occur within the Black Run watershed directly across West Liberty Road upon completion of mining activities and reclamation of the Phase I mining activity.**

**The replacement plan will initially consist of a Palustrine, Persistent, Emergent wetland community, succeeding into a Scrub Shrub, Broadleaved Deciduous wetland community supported by a soil saturated and seasonally flooded hydrological regime.**

**Soil saturated conditions are expected to occur throughout the growing season from the surface to one (1) foot below the surface based on the existing data gathered during the delineation of the adjacent wetland community and exploratory test pit data. The site exhibits a perched water table that outcropped in many places along the upland/wetland boundary of the adjacent wetland community. This supporting hydrology will be intercepted by excavation and grading as part of the Phase I reclamation plan to create and maintain soil saturated areas. The final grade (elev. 1,200') will also permit temporary inundation in some portions of or the entire replacement site during storm events and seasonal fluctuations from surface water runoff. The interfacing of perched ground water and surface water is expected to provide soil saturated conditions throughout and beyond the growing season.**

Soil conservation measures will be used to transfer the hydric soils from the affected wetlands into the replacement site. The top 12 inches of soil within the affected wetlands will be excavated and stockpiled as necessary until the replacement site grading is completed. This soil stockpile will be covered with a tarp(s) to reduce evaporation and maintain moisture within the soil. Watering will be conducted on an as needed basis during the stockpiling period. The stockpiled hydric soil will be placed in the wetland replacement site and brought to grade (elev. 1,200') as depicted on the Exhibit 18 and the attached Cross Sections. At a minimum, this soil will act as a planting medium for the selected plant species. However, this soil will contain a seed bank of indigenous hydrophytic plant species that, if properly stored, will likely germinate and proliferate within the wetland replacement site.

Plants and seed can be obtained from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA, 16335, 800-873-3321 or www.ernstseed.com. Exhibit 18 contains the planting plan proposed for the replacement site. Seed will be mechanically broadcasted on the replacement site and plant stock will be hand planted using a planting dibble or small shovel. Survival rate and percent aerial cover for seeded species are anticipated to be between 90 and 100 percent and survival rate and percent aerial cover for planted species are anticipated to be between 80 and 100 percent for survival and 75 to 90 percent for aerial cover after one (1) full growing season. The percent aerial cover at five (5) years of maturity is expected to be 100 percent, consisting of hydrophytic plant species.

Seed mix types that will be planted are OBL – FACW Perennial Food and Cover Wetland Mix (ERNMX-120) and Wildlife Food and Shelter Shrub Mix (ERNMX-138). The ERNMX-120 is composed of Fox sedge, *Carex vulpinoidea* (23%); Virginia wild rye, *Elymus virginicus* (20%); Giant bur reed, *Sparganium eurycarpum* (10%); Fringed (Nodding) sedge, *Carex crinita* (5%); Nodding sedge, *Carex gynandra* (5%); Hop sedge, *Carex lupulina* (5%); Lurid sedge, *Carex lurida* (5%); Blunt broom sedge, *Carex scoparia* (5%); Soft rush, *Juncus effusus* (5%); Wool grass, *Scirpus cyperinus* (5%); Eastern bur reed, *Sparganium americanum* (5%); Nodding bur marigold, *Bidens cernua* (3%); Cosmos bristly sedge, *Carex comosa* (2%); Rattlesnake grass, *Glyceria canadensis* (1%); and Rice cutgrass, PA Ecotype, *Leersia oryzoides, PA ecotype* (1%). The ERNMX-138 is composed of Fox sedge, *Carex vulpinoidea* (24%); Arrow wood, *Viburnum dentatum* (14%); Virginia wild rye, *Elymus virginicus* (11%); Lurid sedge, *Carex lurida* (10%); Silky dogwood, *Cornus amomum* (10%); Grey dogwood, *Cornus racemosa* (10%); Hop sedge, *Carex lupulina* (5%); Blunt broom sedge, *Carex scoparia* (7%); Hercules' club, *Aralia spinosa* (3%); Awl sedge, *Carex stipata* (2%); Cosmos bristly sedge, *Carex comosa* (1%); Buttonbush, *Cephalanthus occidentalis* (2%); and Meadow sweet, *Spiraea alba* (1%).

Rooted cuttings (8 to 12 inch heights) of Red-osier dogwood (*Cornus stolonifera)*, Black willow (*Salix nigra)*, and Silky willow (*Salix sericea)* will be planted as specified on the planting plan details. These shrubs will be planted at 6 foot centers at the designated locations and quantities depicted on the attached planting plan. Shrub placement is intended to provide a border of shrub development around the seed herbaceous zone that will provide additional edge effect within the wetland mitigation site. This edge effect is enhanced due to the upland open field environment that will exist around the mitigation site.

Slopes throughout the wetland replacement site will be level. Upland slopes will approximately 17:1 (0.06 percent) on the north, northeast and southeast sides. On the south, southwest, northwest sides the upland slopes will approximate 3:1 (0.33 percent). The surface grading will be left rough to create micro environments that control and trap surface water as well as carbonaceous and inorganic nutrients.

Construction of the replacement site will begin concurrent to the Phase I post-mining reclamation. It is anticipated that upon beginning site reclamation activities, it will take approximately one (1) week for construction stakeout, three (3) to four (4) weeks to complete the final grading of the wetland replacement site, and three (3) weeks to complete seeding, planting and mulching.

One (1) year after the wetland replacement site is completed it will function in full capacity for drainage and flow patterns, stormwater retention, sediment stabilization and surface water discharge. Biological functions such as food chain production, aquatic and terrestrial habitat, nesting, spawning, and resting sites will increase as the wetland replacement community matures and vegetation composition stabilizes. Natural filtration and pollution prevention functions will be partially exhibited in varying degrees and will increase in their representation and function as the wetland replacement community matures. All wetland functions that occurred within the affected wetlands will be fully exhibited and functional within the mitigation site at the end of five (5) full growing seasons and will include additional functions such as aquatic habitat, spawning sites, natural filtration, and pollution prevention.

**Wetland replacement sites are generally monitored for a minimum of five (5) years which will include a site visit twice a year for the first three (3) years and once a year for the remaining two (2) years, as outlined in the PA DEP Technical Guidance Document 363-0300-001. Inspections will be conducted within the growing season, as depicted by a PA DEP map for identifying growing seasons for wetland hydrology. These inspections are usually completed between April 15 and October 15 for this region. A report will be generated from each inspection that will discuss wetland determination parameters, succession of the wetland replacement site, success to date, function and value development, and a discussion of problems and remedial measures if warranted. A copy of the report will be submitted to the owner, COE and PA DEP.**

**Design details can be found on attached site plan and the included Cross Sections. A site plan of the wetland mitigation map and surrounding land uses, grading plan, planting plan, and planting specifications are included. The cross sections indicate existing wetland elevation data, mitigation site elevation data, water elevation data, underlying material information and slope data.**

*Show the location of replacement wetland sites on the Operations Map (Exhibit 9) and the Land Use and Reclamation Map (Exhibit 18).*

***Note:*** *At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres). The Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected. Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.*

# Proposed Impacts to Aquatic Resources
# Mine 47
# Worth Township, Butler County, PA
# Glacial Sand & Gravel Co.

| Wetland | Area within Permit Boundary (ac) | Temporary Impact (ac) | Permanent Impact (ac) |
|---|---|---|---|
| 1 | 2.49 | 0.00 | 0.00 |
| 2 | 2.30 | 0.00 | 1.70 |
| 3* | 0.19 | 0.00 | 0.19 |
| 4 | 0.31 | 0.01 | 0.00 |
| **Total** | **5.29** | **0.01** | **1.89** |

*Wetland 3 is considered non-jurisdictional by the USACE

| Stream | Length within Permit Boundary (linear feet) | Temporary Impact (linear feet) | Permanent Impact (linear feet) |
|---|---|---|---|
| UNT 1 | 780 | 10 | 0 |
| UNT 2 | 0 | 0 | 0 |
| UNT 3 | 580 | 0 | 190 |
| **Total** | **1,360** | **10** | **190** |

## Bintrim, Tyler J LRP

**From:** Bud Davis [ddavis@eadsgroup-clarion.com]
**Sent:** Friday, April 03, 2009 3:32 PM
**To:** Bintrim, Tyler J LRP
**Subject:** RE: 2008-280 Glacial Sand and Gravel Co. Mine 47

Tyler,

Just to let you know next Monday April 6, 2009 will be my last day at EADS. Please contact and send all correspondence pertaining to the above project to Michal L. Jones - Stewart, Project Manager at 814-764-5050 or mjones@eadsgroup.com. Thank you.

Bud Davis

From: Bintrim, Tyler J LRP [mailto:tyler.j.bintrim@usace.army.mil]
Sent: Friday, March 27, 2009 8:38 AM
To: Bud Davis
Subject: 2008-280 Glacial Sand and Gravel Co. Mine 47

Mr. Davis:
I am in receipt of the subject referenced permit application. I will need the following items for Public Notice.

1. A location map that clearly depicts the project limits.

2. 8.5 by 11 inch drawings showing the construction of the ponds and mitigation area and showing impacts to existing resources.

3. A more detailed project description stating why impacts must be incurred and whether wetland 1 will be impacted in any way.

4. A mitigation statement explaining how 1.77 acres of wetland impact will be adequately mitigated.

Please submit this information in order to continue the 404 review process.

Thank you,

Tyler J. Bintrim
Regulatory Project Manager
U.S. Army Corps of Engineers Pittsburgh District Federal Building, 20th Floor 1000 Liberty Avenue Pittsburgh, PA 15222

P: 412-395-7115



4/3/2009 via email

## Bintrim, Tyler J LRP

**From:** Bud Davis [ddavis@eadsgroup-clarion.com]
**Sent:** Friday, April 03, 2009 3:23 PM
**To:** Bintrim, Tyler J LRP
**Cc:** Kyle Schwabenbauer; Michal Jones; Rick Tote; Rob Stormer
**Subject:** RE: 2008-280 Glacial Sand and Gravel Co. Mine 47

**Attachments:** Project Location Map.pdf; ALTERNATIVES.docx; WETLAND MITIGATION & RESTORATION.docx; Mine 47 Plan Sheets.pdf

Project Location Map.pdf (634 ... | ALTERNATIVES.docx (15 KB) | WETLAND GATION & RESTOR... | Mine 47 Plan Sheets.pdf (2 MB)...

Mr. Bintrim:

As requested we are providing the following information for the Public Notice pertaining to Glacial Sand and Gravel Company's Section 404 permit application:

1. Attached is a copy of the USGS Slippery Rock quadrangle that indicates the permit boundary.

2. Attached are 8 ½ x11 pages of the ponds, processing plant and wetland mitigation construction that shows the resource impacts.

3. Wetland No. 1 will not be directly or indirectly impacted by the proposed mining and wetland mitigation construction. Ground water elevations to the south of Wetland No. 1 will remain the same within and surrounding the permitted area. Due to no anticipated impacts to this wetland community, a separate module was completed for this resource. Please refer to PA DEP Module 14, Streams/Wetlands, North of West Liberty Road, Wetland No. 1.

4. Because Wetlands No. 2, 3 and a portion of 4 will be permanently impacted as a result of the mining operation and Wetland No. 4 will also be temporarily impacted as a result of the construction of a sanitary pipeline crossing, two (2) separate Module 14 documents (Wetland No. 2, 3 and 4 and Wetland No. 4 (Temporary Impacts)) were completed. Attached is the text from the alternatives discussion from both modules for your convenience and these discussions can be found in Module 14, Section 14.4(b).

5. Also, discussions for specific wetland mitigation and restoration measures can be found within the same modules discussed above in Section 14.5(a)(3). Attached for your convenience is the text from these modules.

I hope this information meets your need for the Public Notice and Section 404 Permit. If you have any questions please contact Michal L. Jones – Stewart, Project Manager at 814-764-5050 or mjones@eadsgroup.com.

From: Bintrim, Tyler J LRP [mailto:tyler.j.bintrim@usace.army.mil]
Sent: Friday, March 27, 2009 8:38 AM
To: Bud Davis
Subject: 2008-280 Glacial Sand and Gravel Co. Mine 47

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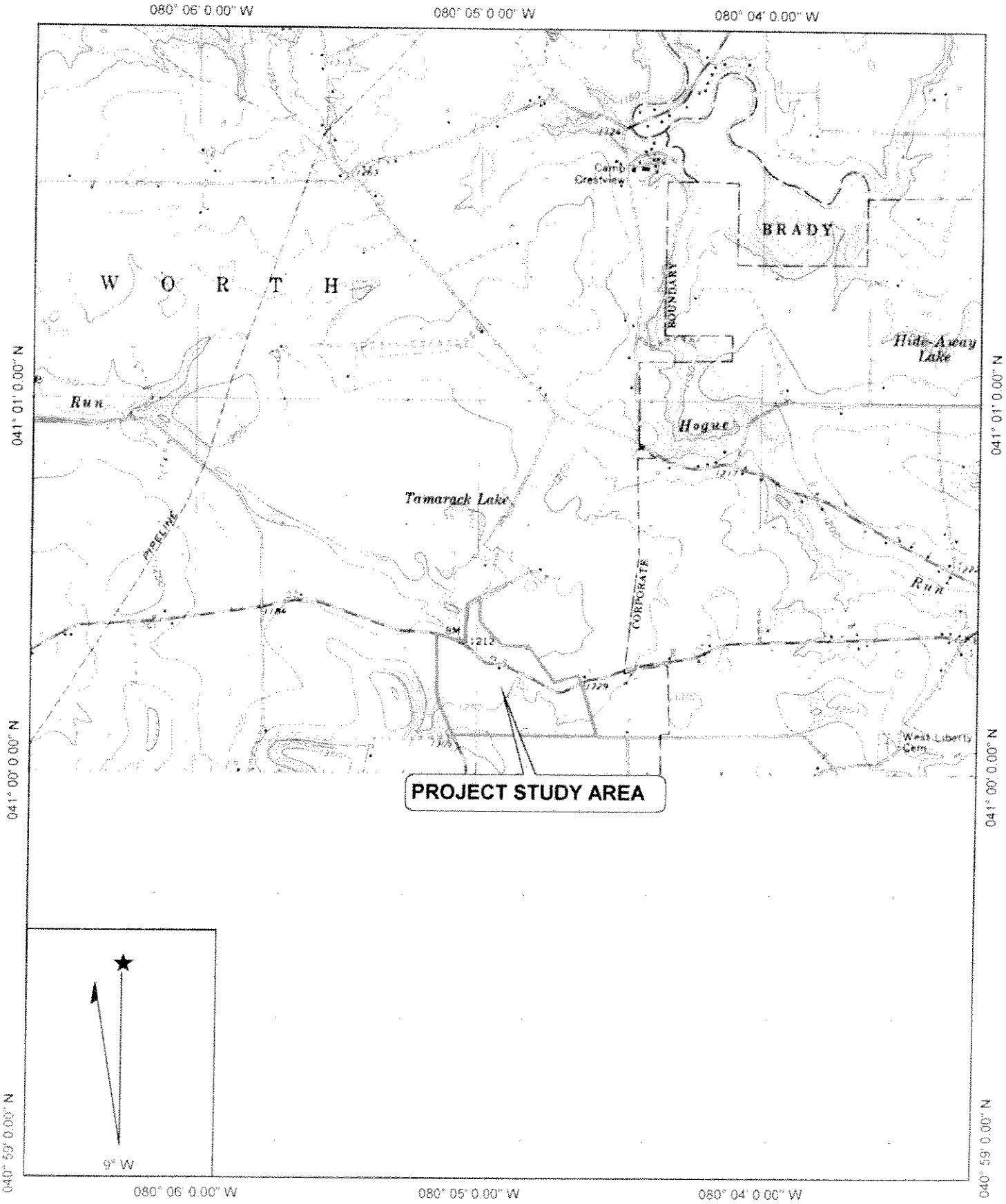
Please submit this information in order to continue the 404 review process.

Thank you,

Tyler J. Bintrim
Regulatory Project Manager
U.S. Army Corps of Engineers Pittsburgh District Federal Building, 20th Floor 1000 Liberty Avenue Pittsburgh, PA 15222

P: 412-395-7115




Name: SLIPPERY ROCK
Date: 1/23/2008
Scale: 1 inch equals 2000 feet

Location: 041° 00' 27.24" N 080° 04' 53.88" W
Caption: Glacial Sand and Gravel Co.
Mine 47 SMP
Worth Township, Butler County

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# ALTERNATIVES

### Permanent Impacts to Wetlands No. 2, 3 and 4

The No Mining Alternative is a feasible alternative but was considered not prudent due to the fact that Glacial Sand & Gravel currently owns the permit area and this alternative would not permit them to regain their investment and continue to provide aggregate products to a highly demanding market. Mining with Wetland Avoidance is not considered feasible or prudent due to the required area for constructing a processing plant, the required area to construct sufficient wash water storage ponds to supply the processing plant and the inability to fit these required areas within an area that does not hinder the extraction of aggregate material and at the same time prevent wetland impacts. The location of the processing plant and storage ponds are located in an area that contains lower volumes of aggregate material in comparison to the rest of the permit area. The location of the storage ponds is such that permits the collection of as much surface water runoff as possible. Likewise, this area is selected for the construction of the processing plant and wash water ponds because it will not interfere with the extraction of aggregate material that economically supports the mobilization of mining equipment and the actual mining activity.

Re-locating the processing plant and wash water ponds in order to avoid impacting the wetland was evaluated and considered not feasible or prudent based on the following reasons: 1) Re-location of the wash water storage ponds would require shifting the location of the processing plant in order to fit both operations within this area of the permit. This results in an economical loss of aggregate material that could be mined during the proposed mining phases and 2) Construction of the processing plant and wash water ponds in order to not interfere with the extraction of marketable aggregate would need to be done within the upslope areas of the wetlands. Field observations of the hydrological regime that supports this wetland community indicates this wetland is supported predominantly by a perched water table that outcrops in several places along the upper boundary line of the wetland community.

This consensus is supported by the observation of the drying up of these springs and lack of visible water within the wetland community during the spring and summer of 2007. Test hole and monitoring well information upslope of the wetland community reveals there are varying clay and silty clay layers immediately below the surface and ground water elevations were recorded to be at elevations from 1216 to 1218. The surface elevation within the wetland community ranges from 1218 to 1222. These impervious layers are believed to exist below the wetland community and as a result form a bowl whereby ground water and surface water remains perched. Plant and wash water storage pond construction within the upslope area of the wetland community will negatively impact the wetland community due to: 1) diverting all surface water runoff around the processing plant to the wash water storage ponds, likewise around the wetland community as well and 2) Excavation into the hillside to construct the subgrade for the processing plant and wash water storage ponds will break these clay barriers and intercept the shallow ground water table lying below. This would have a negative impact on the wetland community downgrade by intercepting and redirecting the predominant hydrology that supports this wetland.

Wetland avoidance was also evaluated with a sub-alternative that eliminated the collection of surface water runoff and the construction of wash water storage ponds. This alternative depends solely on well water to provide the required wash water. This alternative would still have an indirect impact on the wetland community as well as a direct impact to surface water quality. The function of and need for wash water ponds is to: 1) recycle and store sufficient wash water from the processing plant that will conserve the use of and reduce the need for replacement water; 2) reduce the demand on groundwater resources from pumping water from wells to the processing plant and; 3) prevent sediment laden water from being discharged into adjoining tributaries. Construction of the processing plant will still result in the breaking up of the clay barrier that lies immediately underneath and the interruption of the shallow ground water table. This affect will again negatively impact the wetland community located downgrade. Providing the required water to operate the processing plant by using wells without recycling any wash water would likely result in a significant draw down of the ground water table. This again would negatively impact the wetland community. Sediment laden waters which would still require a detention basin to remove the sediment before discharging would potentially impact adjacent tributaries.

The Mining with Wetland Impacts alternative was considered feasible and prudent and reducing impacts to the wetland community is not feasible due to spatial constraints, already proposing the minimum wash water storage pond volume needed to support the processing plant and the unavoidable impact to the perched water table within the upstream area by plant construction. This alternative remains to be the alternative that achieves the goals and objectives of Glacial Sand & Gravel with the least environmental impact as a whole based on the following reasons: 1) It permits Glacial Sand & Gravel to streamline the mining process and extract the full intent of marketable aggregate within the permit area; 2) It provides the minimum required amount of wash water storage and recycling to support the processing plant therefore, reducing the draw on groundwater resources within and surrounding the permit area; 3) It provides a means to handle stormwater from the plant area and at the same time promotes water conservation as part of the plant operation; and 4) It provides detention time to settle out sediment and significantly reduces the need to discharge sediment laden waters to nearby tributaries.

**Temporary Impacts to Wetland No. 4**

The No Build Alternative is a feasible alternative but was considered not prudent. Due to the length of time that the plant will be operating and the number of full time employee's onsite, a sanitary onsite septic system was warranted; not to mention required by the PA DEP.

The sewer line alignment avoiding impacts to Wetland No. 4 was not a feasible alternative due to weighing design standards, slope requirements and site development barriers. The stream crossing site was selected based on the shallower water depth, drainage area, required slope standards for sanitary pipelines and the ability to achieve a minimum of 3 feet of cover over the stream crossing. Design parameters for gravity flow sanitary pipelines require a minimum of a 1 percent slope and the sanitary pipeline between the septic and dosing tanks must be at a minimum of a 2 percent slope. The need to maintain a minimum 2 percent slope between the septic and dosing tanks required both tanks to be located on the west side of the stream; since the natural grade on the east side of the stream was too flat. Other stream crossing locations that

would not impact Wetland No. 4 would not maintain the required slopes for gravity flow sanitary lines.

The sewer line alignment with minimal impact alternative was considered feasible and prudent based on meeting the required minimum of 3 feet of covering at the wetland and stream crossing, required slopes for sanitary line construction, the depth of water in the stream and the location of the sediment pond. The first alternative was located approximately 25 linear feet to the north of the current proposed crossing. Upon additional wetlands investigation this alternative resulted in 0.03 acres of temporary wetland impact as well as a stream crossing. The location was shifted south reducing temporary wetland impacts by crossing at a more narrow point within the wetland community resulting in 0.01 acres of temporary impact. This alternative achieves the goals and objectives of Glacial Sand & Gravel and the PA DEP with minimal environmental impacts to this wetland community that are temporary and can be mitigated through restoration methods.

# WETLAND MITIGATION

**Wetlands No. 2, 3 and 4**

As per PA DEP Technical Guidance Document 363-0300-001 the following information is being provided:

The wetland mitigation plan proposes to replace the affected wetlands at a 1:1 ratio.

The wetland functions and values identified to be present within the affected wetlands will be replaced equally and in some cases to a greater extent (i.e. food chain production, general habitat, food/cover/nesting) within the proposed replacement plan due to its immediate location to the large wetland area to the north and northwest and ability to function in conjunction with this wetland. As a result its location, design and concurrent functions, other functions such as aquatic habitat, natural water filtration and pollution prevention are expected to be enhanced.

Wetland replacement will occur within the Black Run watershed directly across West Liberty Road upon completion of mining activities and reclamation of the Phase I mining activity.

The replacement plan will initially consist of a Palustrine, Persistent, Emergent wetland community, succeeding into a Scrub Shrub, Broadleaved Deciduous wetland community supported by a soil saturated and seasonally flooded hydrological regime.

Soil saturated conditions are expected to occur throughout the growing season from the surface to one (1) foot below the surface based on the existing data gathered during the delineation of the adjacent wetland community and exploratory test pit data. The site exhibits a perched water table that outcropped in many places along the upland/wetland boundary of the adjacent wetland community. This supporting hydrology will be intercepted by excavation and grading as part of the Phase I reclamation plan to create and maintain soil saturated areas. The final grade (el. 1200) will also be as such to permit temporary inundation in some portions of or the entire replacement site during storm events and seasonal fluctuations from surface water runoff. The interfacing of perched ground water and surface water is expected to provide soil saturated conditions throughout and beyond the growing season.

Soil conservation measures will be used to transfer the hydric soils from the affected wetlands into the replacement site. The top 12 inches of soil within the affected wetlands will be excavated and stockpiled as necessary until the replacement site is grading is completed. This soil stockpile will be covered with a tarp(s) to reduce evaporation and maintain moisture within the soil. Watering will be done on an as needed basis during the stock piling period. The stock piled hydric soil will be placed in the wetland replacement site and brought to grade (final grade elevation = 1200) as depicted on the Exhibit 18 and the attached Cross Sections. At a minimum this soil will act as a planting medium for the selected plant species; however this soil will contain a seed bank of indigenous hydrophytic plant species that, if properly stored, will likely germinate and proliferate within the wetland replacement site.

Plants and seed can be obtained from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA, 16335, 800-873-3321 or www.ernstseed.com. Exhibit 18 contains the planting plan

proposed for the replacement site. Seed will be mechanically broadcasted on the replacement site and plant stock will be hand planted using a planting dibble or small shovel. Survival rate and percent aerial cover for seeded species are anticipated to be between 90 and 100 percent and survival rate and percent aerial cover for planted species are anticipated to be between 80 and 100 percent for survival and 75 to 90 percent for aerial cover after one (1) full growing season. The percent aerial cover at five (5) years of maturity is expected to be 100 percent and consisting of hydrophytic plant species.

Seed mix types that will be planted are OBL – FACW Perennial Food and Cover Wetland Mix (ERNMX-120) and Wildlife Food and Shelter Shrub Mix (ERNMX-138). The ERNMX-120 is composed of Fox sedge, *Carex vulpinoidea* (23%); Virginia wild rye, *Elymus virginicus* (20%); Giant bur reed, *Sparganium eurycarpum* (10%); Fringed (Nodding) sedge, *Carex crinita* (5%); Nodding sedge, *Carex gynandra* (5%); Hop sedge, *Carex lupulina* (5%); Lurid sedge, *Carex lurida* (5%); Blunt broom sedge, *Carex scoparia* (5%); Soft rush, *Juncus effusus* (5%); Wool grass, *Scirpus cyperinus* (5%); Eastern bur reed, *Sparganium americanum* (5%); Nodding bur marigold, *Bidens cernua* (3%); Cosmos bristly sedge, *Carex comosa* (2%); Rattlesnake grass, *Glyceria canadensis* (1%); and Rice cutgrass, PA Ecotype, *Leersia oryzoides, PA ecotype* (1%). The ERNMX-138 is composed of Fox sedge, *Carex vulpinoidea* (24%); Arrow wood, *Viburnum dentatum* (14%); Virginia wild rye, *Elymus virginicus* (11%); Lurid sedge, *Carex lurida* (10%); Silky dogwood, *Cornus amomum* (10%); Grey dogwood, *Cornus racemosa* (10%); Hop sedge, *Carex lupulina* (5%); Blunt broom sedge, *Carex scoparia* (7%); Hercules' club, *Aralia spinosa* (3%); Awl sedge, *Carex stipata* (2%); Cosmos bristly sedge, *Carex comosa* (1%); Buttonbush, *Cephalanthus occidentalis* (2%); and Meadow sweet, *Spiraea alba* (1%).

Rooted cuttings (8 to 12 inch heights) of Red-osier dogwood, *Cornus stolonifera*, Black willow, *Salix nigra*, and Silky willow, *Salix sericea* will be planted as specified on the planting plan details. These shrubs will be planted at 6 foot centers at the designated locations and quantities depicted on the attached planting plan. Shrub placement is intended to provide a border of shrub development around the seed herbaceous zone that will provide additional edge effect within the wetland mitigation site. This edge effect is enhanced due to the upland open field environment that will exist around the mitigation site.

Slopes throughout the wetland replacement site will be level. Upland slopes will approximate 17:1 (0.06 percent) on the north, northeast and southeast sides. On the south, southwest, northwest sides the upland slopes will approximate 3:1 (0.33 percent). The surface will be left rough to create micro environments that control and trap surface water as well as carbonaceous and inorganic nutrients.

Construction of the replacement site will begin concurrent with the Phase I post-mining reclamation. It is anticipated that upon beginning site reclamation activities, it will take one (1) week for construction stakeout, three (3) to four (4) weeks to complete the final grading of the wetland replacement site and three (3) weeks to complete seeding, planting and mulching.

One (1) year after the wetland replacement site is completed it will function in full capacity for drainage and flow patterns, stormwater retention, sediment stabilization and surface water discharge. Biological functions such as food chain production, aquatic and terrestrial habitat,

nesting, spawning, and resting sites will increase as the wetland replacement community matures and vegetation composition stabilizes. Natural filtration and pollution prevention functions will be partially exhibited in varying degrees and will increase in their representation and function as the wetland replacement community matures as well. All wetland functions that occurred within the affected wetlands will be fully exhibited and functional within the mitigation site at the end of five (5) full growing seasons; to include additional functions such as aquatic habitat, spawning sites, natural filtration, and pollution prevention.

Wetland replacement sites are generally monitored for a minimum of five (5) years which will include a site visit twice a year for the first three (3) years and once a year for the remaining two (2) years, as outlined in the PA DEP Technical Guidance Document 363-0300-001. Inspections are done within the growing season, as depicted by a PA DEP map for identifying growing seasons for wetland hydrology. These inspections are usually done between April 15 and October 15 for this location. A report is generated from each inspection that will discuss wetland determination parameters, succession of the wetland replacement site, success to date, function and value development, and a discussion of problems and remedial measures if warranted. A copy of the report will be submitted to the owner, COE and PA DEP.

Design details can be found on attached site plan and the included Cross Sections. A site plan of the wetland mitigation map and surrounding land uses, grading plan, planting plan, and planting specifications are included. The cross sections indicate existing wetland elevation data, mitigation site elevation data, water elevation data, underlying material information and slope data.

# Wetland Restoration

### Wetland No. 4

The wetland restoration plan proposes to restore the affected wetlands at a 1:1 ratio.

The wetland functions and values identified to be present within the affected wetland will be restored equally as a result of the proposed restoration plan based on being able to restore the affected area within the actual affected area and Black Run watershed.

The restoration plan will initially consist of a Palustrine, Persistent, Emergent wetland community, succeeding into a Scrub Shrub, Broadleaved Deciduous wetland community supported by a soil saturated and seasonally flooded hydrological regime.

Inundated and soil saturated conditions are expected to occur throughout the growing season above the surface to one (1) foot below the surface based on the existing data gathered during the delineation of the wetland community.

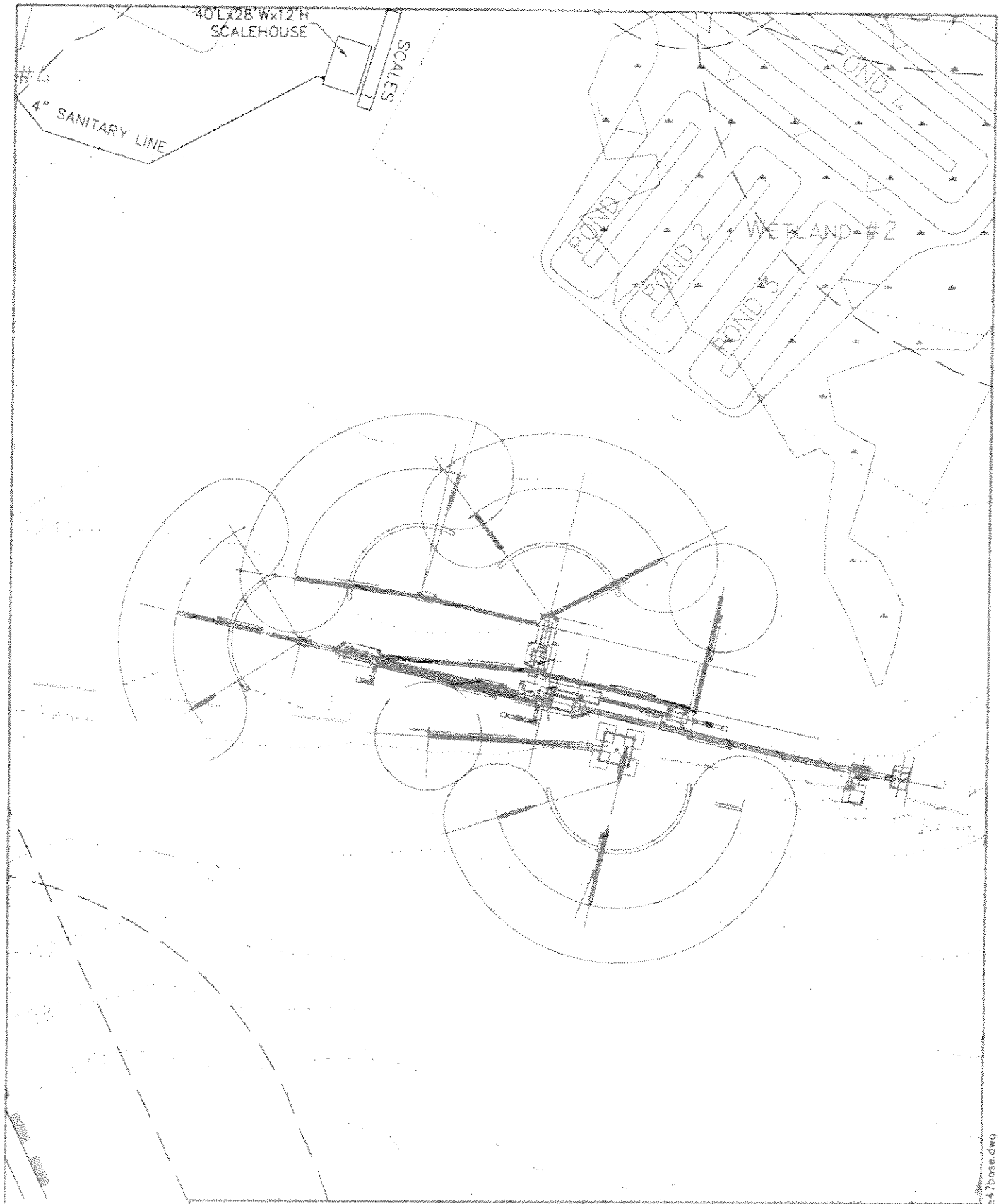
Soil conservation measures will be used to restore the hydric soils within the affected wetlands. The top 12 inches of soil within the affected wetlands will be excavated and stockpiled as necessary until the bedding and placement of the pipe is completed. This stockpile will be covered with a tarp(s) to reduce evaporation and maintain moisture within the soil. Upon completion of the bedding and placement of the pipe the trench will backfilled up to within a

foot below the surface. The hydric soil will be placed within this portion of the trench and brought to the existing grade. At a minimum this soil will act as a planting medium for the specified seed mix; however this soil will contain a seed bank of indigenous hydrophytic plant species that, if properly stored and placed, will likely germinate and proliferate within the existing wetland community.

Once the trench has been graded to the existing contour it will be seeded with Wildlife Food and Shelter Shrub Mix (ERNMX-138) at a rate of 15 lbs per acre. The ERNMX-138 is composed of Fox sedge, *Carex vulpinoidea* (24%); Arrow wood, *Viburnum dentatum* (14%); Virginia wild rye, *Elymus virginicus* (11%); Lurid sedge, *Carex lurida* (10%); Silky dogwood, *Cornus amomum* (10%); Grey dogwood, *Cornus racemosa* (10%); Hop sedge, *Carex lupulina* (5%); Blunt broom sedge, *Carex scoparia* (7%); Hercules' club, *Aralia spinosa* (3%); Awl sedge, *Carex stipata* (2%); Cosmos bristly sedge, *Carex comosa* (1%); Buttonbush, *Cephalanthus occidentalis* (2%); and Meadow sweet, *Spiraea alba* (1%). As an E & S control crop the restored site will be seeded with Annual ryegrass, *Lolium multiflorum* at a rate of 15 lbs per acre.

Plants and seed can be obtained from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA, 16335, 800-873-3321 or www.ernstseed.com. Seed will be mechanically broadcasted on the restored site and the anticipated survival rate and percent aerial cover is expected to be between 90 and 100 percent after one (1) full growing season. The percent aerial cover at three (3) years of maturity is expected to be 100 percent and consisting of hydrophytic plant species.

Restoration of the wetland community shall begin immediately upon completion of the bedding and placement of the pipe. It is anticipated that upon beginning site reclamation activities, restoration measures will be completed the same day. Within one (1) year after the affected wetland community is restored it is expected to function in full capacity for drainage and flow patterns, stormwater retention, sediment stabilization and surface water discharge. Biological functions such as food chain production, aquatic and terrestrial habitat, nesting, spawning, and resting sites will increase as the restored area matures and vegetation composition stabilizes. Natural filtration and pollution prevention functions will be partially exhibited in varying degrees and will increase in their representation and function as the restored area matures as well. All wetland functions that occurred within the affected wetlands will be fully exhibited and functional within the restored area at the end of three (3) full growing seasons.




THE EADS GROUP
ENGINEERING ARCHITECTURE AND DESIGN SERVICES

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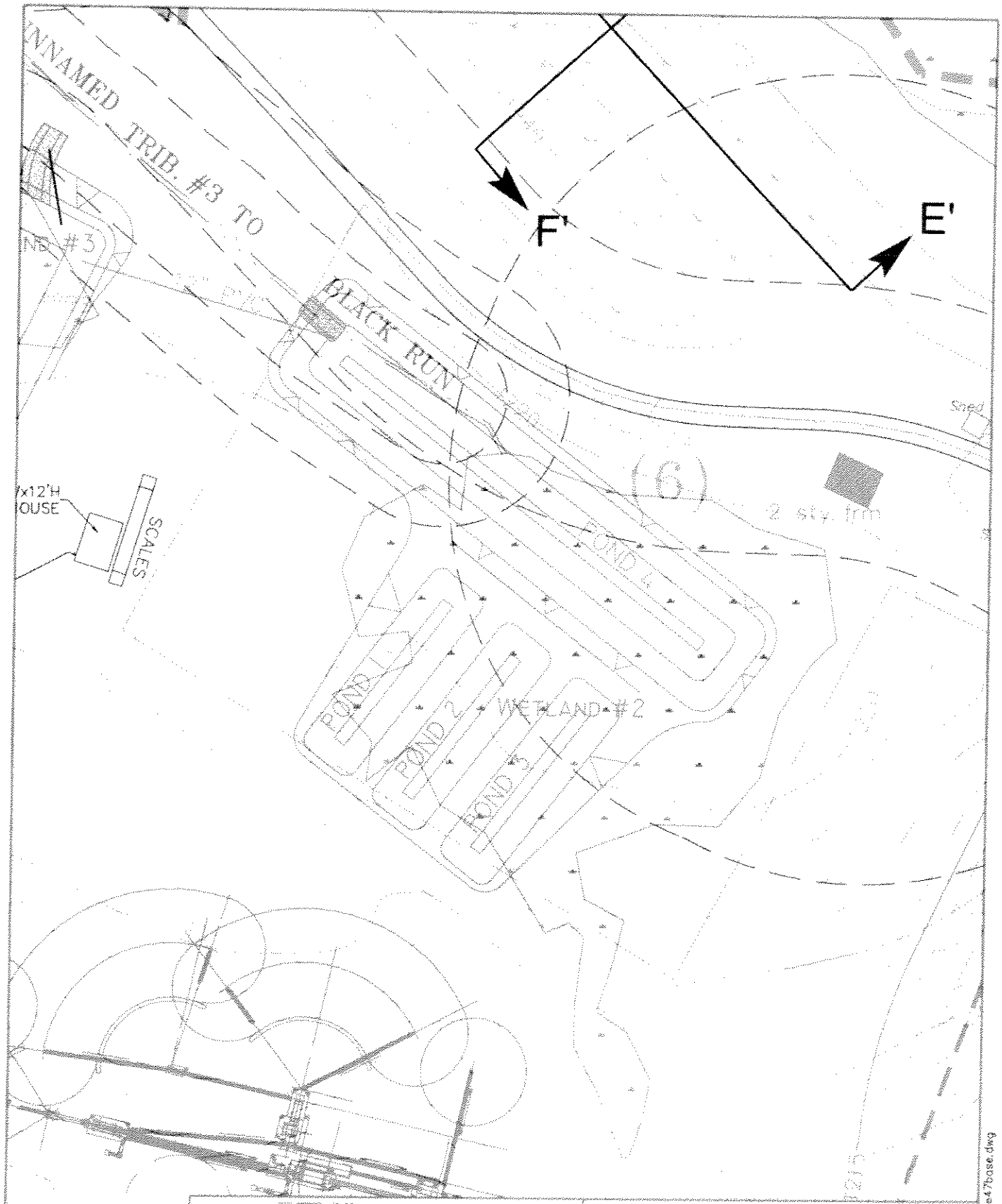
EMAIL: clarion@eadsgroup-clarion.com

GLACIAL SAND AND GRAVEL CO.
P.O. BOX 1022
KITTANNING, PA 16201

WORTH TOWNSHIP

BUTLER COUNTY

DWG NAME: Mine47base.dwg

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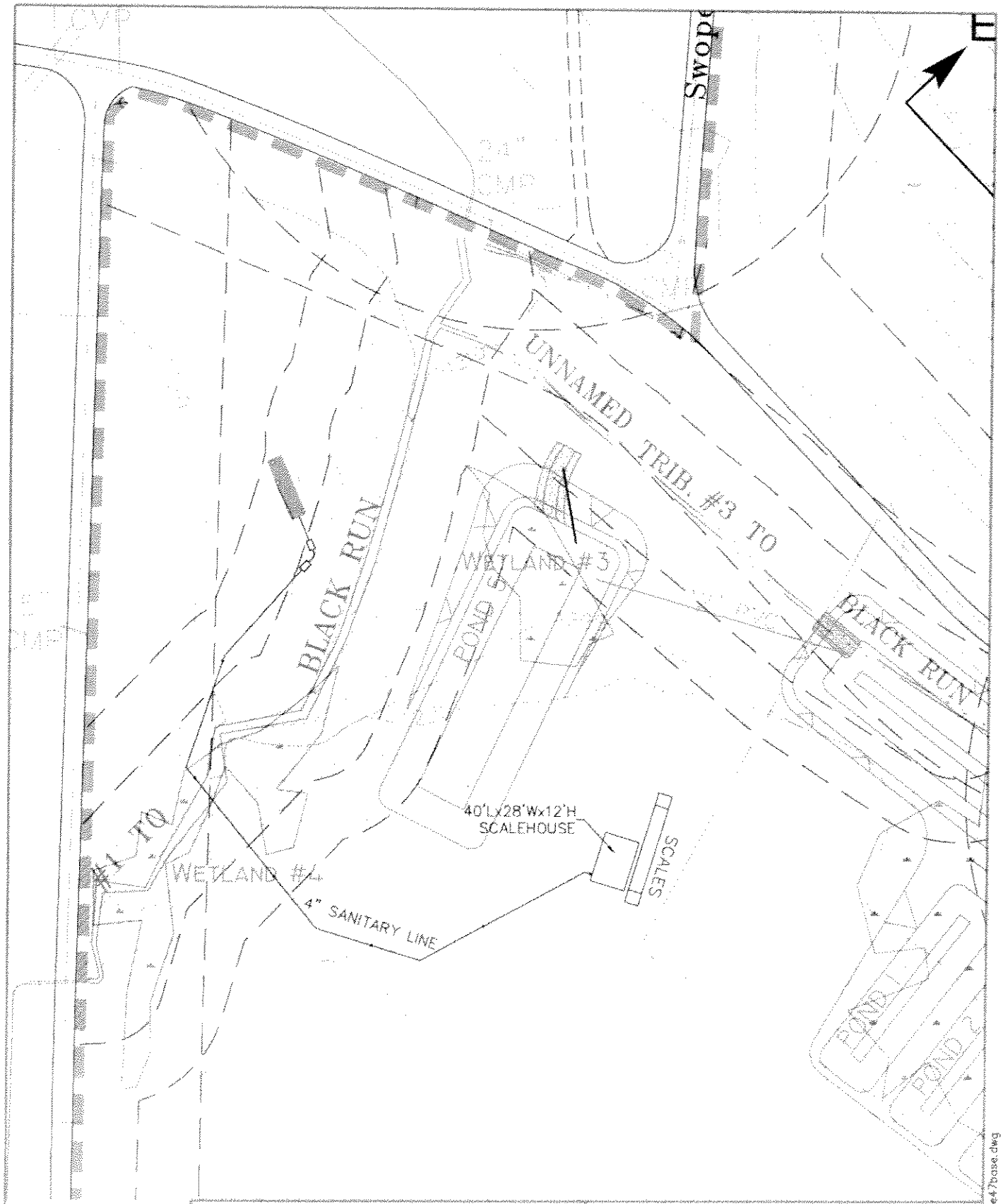


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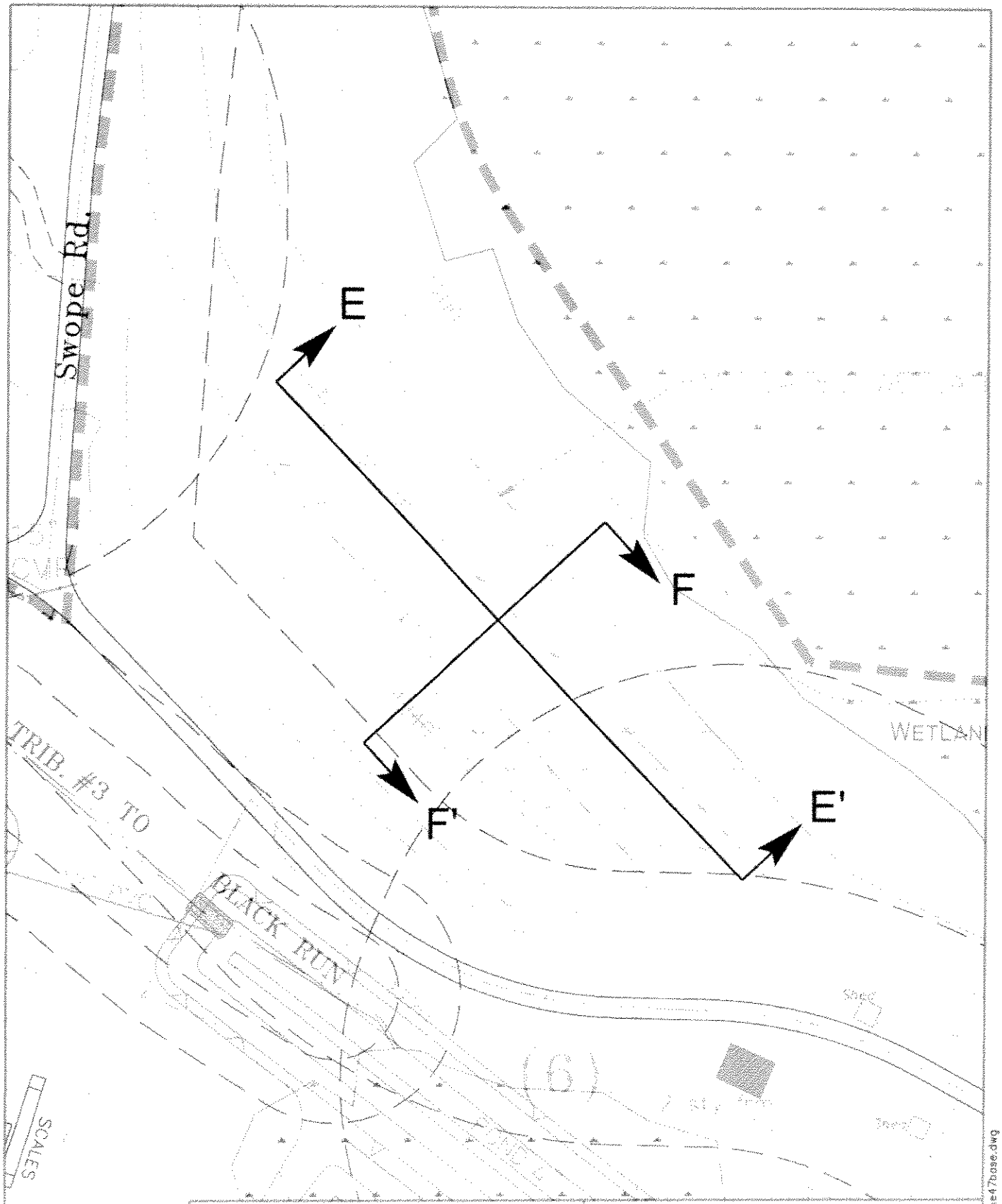


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WORTH TOWNSHIP BUTLER COUNTY

DWG NAME: Mine47base.dwg

## Bintrim, Tyler J LRP

**From:** Bintrim, Tyler J LRP
**Sent:** Friday, March 27, 2009 8:38 AM
**To:** 'Bud Davis'
**Subject:** 2008-280 Glacial Sand and Gravel Co. Mine 47

Mr. Davis:
I am in receipt of the subject referenced permit application. I will need the following items for Public Notice.

1. A location map that clearly depicts the project limits.

2. 8.5 by 11 inch drawings showing the construction of the ponds and mitigation area and showing impacts to existing resources.

3. A more detailed project description stating why impacts must be incurred and whether wetland 1 will be impacted in any way.

4. A mitigation statement explaining how 1.77 acres of wetland impact will be adequately mitigated.

Please submit this information in order to continue the 404 review process.

Thank you,

Tyler J. Bintrim
Regulatory Project Manager
U.S. Army Corps of Engineers Pittsburgh District Federal Building, 20th Floor 1000 Liberty Avenue Pittsburgh, PA 15222

P: 412-395-7115

Pennsylvania Department of Conservation and Natural Resources

March 13, 2009

**Bureau of Forestry**

**Michal Jones-Stewart**
**The EADS Group**
15392 Route 322
Clarion, PA 16214

| |
|---|
| ***Pennsylvania Natural Diversity Inventory Review, PNDI Numbers:*** |
| **20071211120195, 20071024114200 and 20061010059358** |
| Glacial Sand and Gravel - Mine 47 and Rodgers Plant |
| Worth Twp; Butler County |

Dear Ms. Jones-Stewart,

This response is in reference to your Pennsylvania Natural Diversity Inventory (PNDI) coordination for potential impacts to resources of concern under the Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

Based on our PNDI reviews in October and November of 2007 and April 2008 we determined there could be potential impacts to species and/or resources of special concern under the jurisdiction of DCNR and subsequently requested surveys for *Carex alata*, *Carex pseudocyperus*, *Cladium mariscoides*, *Lobelia kalmii*, *Parnassia glauca*, *Carex prairea*, *Cypripedium reginae*, *Epilobium strictum*, *Oxypolis rigidior*, *Salix petiolaris*, *Solidago purshii*, *Spiranthes romanzoffiana*, *Stenanthium gramineum* and *Trollius laxus sensu stricto*. After thorough review of the survey reports, maps, and other documentation that you and Dr. Fred Brenner submitted to our office between the months of August 2008 and January 2009, we concur that *Schoenoplectus acutus* (syn. *Scirpus acutus*) and *Cladium mariscoides* (both currently state-listed as PA Endangered) were observed and are located within the delineated boundaries of Wetland 1 marked on the enclosed map titled "Rodgers Plant." Along with these two endangered species another state-listed plant, *Carex alata* (PA Threatened) was observed in the project vicinity by Dr. James Bissell during site visits on June 3 and September 3, 2008 (report enclosed). Additionally, our office has recently become aware that the onsite West Liberty Esker will be impacted as a result of the mining activities.

During the environmental review process the original project area was separated into two separate permit areas, the surface mine permit area, portions of which extend north of West Liberty Road, and the NPDES permit area, contained entirely South of West Liberty Road. Below you will find our project concerns separated based on activity and permit area.

**<u>NPDES Application Area</u>**

It is our understanding that the NPDES permit is a "stand alone" permit and is necessary to grade and construct the Rodgers processing plant, including a sediment/polishing pond which will process raw sand and gravel from Mine 31, Mine 47 and other mines in close proximity. As per a February 24, 2009 phone call with you and February 25, 2009 letter you provided to our office we are aware of a deep "production" well drilled to a depth of at least 160 feet from the earth's surface into the Homewood Sandstone that was tested for 72 hours pumped at a rate of 80 gallons per minute. Monitoring of several "observation" wells showed no effects on the local or regional water system from the 80 gal/min test pumping. Results of this study were provided to the DEP Bureau of Mining and Reclamation Knox District Office and the Butler County Conservation District. It is also our understanding that only the "production" well will be used for extraction of water to operate the processing plant.



Rec. 3/26/2009

Reclamation Knox District Office and the Butler County Conservation District. It is also our understanding that only the "production" well will be used for extraction of water to operate the processing plant.

Based on this information, our office has determined that the actions described above for this permit will not directly impact the state-listed endangered plants occurring in Wetland 1. There are no indirect impacts anticipated for the actions proposed in this permit contingent upon the prevention of runoff from activities involved in construction and operation of the Plant from entering Wetland 1 and strict adherence to the equipment/machinery washing request below under "Both Project Areas." Please coordinate further with our office to determine impacts to the endangered plants if the conditions above cannot be met, project plans or activities change, or if during the NPDES permit review the Conservation District determines that withdraw from the production well for the plant will affect the hydrology of Wetland 1 of West Liberty Road.

**Surface Mine Permit Area**

First and foremost we are concerned about the destruction and degradation of Wetland 1 and critical habitat for *Schoenoplectus acutus* (syn. *Scirpus acutus*), *Carex alata* and *Cladim marsicoides* as the Rodgers Plant map submitted January 9, 2009 (mentioned above) indicates the surface mine permit boundary extends into Wetland 1. Please be sure that none of the activities involved in the surface mine permit will harm Wetland 1 or critical habitat for the endangered species through either a change in the local water table or direct earth disturbance impact. Enclosed is a map from our PNDI records indicating the fen habitat onsite; please avoid impacts to the area within this polygon as well as critical habitats for the endangered species described below. Please contact our office for the polygon data and then map the data on project site plans to verify to PA Department of Environmental Protection that this critical habitat for the endangered plants will not be directly impacted.

Critical habitat for *S. acutus* is defined in *The Plants of Pennsylvania* (Rhoads and Block) as shallow water of lake and pond margins. Other habitats *S. acutus* occurs in within our state are open pond waters, sandy lake and bay shores, seepage areas with open/partially filtered light and power utility crossings in succeeding to emergent marshes, also a fen seepage, wet river bank, and sandy wooded border of a spring stream.

*The Plants of Pennsylvania* defines critical habitat for *C. alata* as swamps, peaty shores, wet thickets, and woods, usually on calcareous soils. More specific habitats *C. alata* is found in within our state include open light in wetlands; fens; marsh and sedge meadows; lake shores and quaking mats along lake shores; hummocks and flats in swamps, fens and bogs; and seepages in lakes, swamps or marshes.

Critical habitat for *C. mariscoides* defined by Rhoads and Block include marshes, floating bog mats and shallow lake margins. Other habitats *C. marsicoides* is found in within our state are inundated hydric soils; sphagnum mats, mudflats, edges and boggy hummocks in bogs, fens and marshes; bogs and fens associated with ponds and natural glacial lakes; open meadows and bottom areas and a driveway stream crossing associated with a fen.

Additionally, the maps provided to our office on February 18, 2009 and February 25, 2009 (Exhibit 9/Operations Map) was the first we became aware of the removal of the West Liberty Esker and the creation of the mitigated wetland in its place. We are concerned about these actions as this esker is the best preserved feature of this type in Pennsylvania. Please contact geologist Mr. Gary Fleeger of DCNR Bureau of Topography and Geology / PA Geologic Survey to discuss concerns regarding the esker. Mr. Fleeger can be reached at 717.702.2045 or gfleeger@state.pa.us.

We are also concerned that the species used for the wetland mitigation could possibly indirectly impact Wetland 1. In order to prevent indirect impacts from invasive plant species to endangered species in Wetland 1 please use only native species of local genetic material in the revegitation plan and avoid the use of *Schoenoplectus acutus* (syn. *Scirpus acutus*) and all other threatened, endangered or special concern plants listed in the Pennsylvania Natural Diversity Inventory. Contact our office if you would like guidance on native plant species to use in the mitigation wetland.

**Both Project Areas**

In order to prevent the spread of invasive plant species that may cause indirect impacts to the endangered plants in Wetland 1, please thoroughly wash all vehicles, equipment and machinery at a carwash offsite to remove any invasive plant propagules prior to bringing onsite and commencing any construction activity. Please avoid the use of invasive plant species and plants that are listed as endangered, threatened or special concern in any seed mixes or plantings within the project boundaries. If you would like more information on invasive plant species please visit http://www.dcnr.state.pa.us/forestry/invasivetutorial/index.htm and for a list of endangered, threatened, and special concern plants visit http://www.naturalheritage.state.pa.us/PlantsPage.aspx.

This response represents the most up-to-date summary of the PNDI data files and is applicable for one year. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered. Please me at 717-787-7067 if you have questions concerning this response.

Emilee C. Boyer

Emilee C. Boyer, Environmental Review Specialist FOR Chris Firestone, Plant Program Mgr
DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-787-7067 ~ F: 717-772-0271 ~ c-eboyer@state.pa.us

Enclosures

Cc: Chris Yeakle, DEP Knox Office
Ian Harrell, Butler county Conservation District
Gary Fleeger, DCNR/PA Geologic Survey
Dr. James Bissell, Cleveland Museum of Natural History

**DEPARTMENT OF THE ARMY**
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

**February 27, 2009**

**Darrel Lewis**
**Glacial Sand & Gravel Company**
**P. O. Box 1022**
**Kittanning, PA 16201**

**Derwood B. Davis, Jr.**
**The EADS Group**
**15392 Route 322**
**Clarion, PA 16214**

**Marcia Haberman, Project Manager**

We received your request on February 23, 2009 and your project, **Glacial Sand and Gravel Company - Mine 47, Surface Mine Permit Area, Worth Township, Butler County, PA,** has been assigned to **Marcia Haberman. Marcia** can be contacted at ***(412) 395-7361,*** or via e-mail at:

*Marcia.H.Haberman@usace.army.mil*

Your Corps of Engineers **File Number is ~~2009-426~~** 2008-280. Please contact Marcia with any questions and reference this file number in all correspondence with our office concerning this site.

Sincerely,

Scott A. Hans
Chief Regulatory Branch
Pittsburgh District USACE

DD processed under 2008-280

THE EADS GROUP

ENGINEERING ARCHITECTURE and DESIGN SERVICES

RECEIVED
2009 FEB 23 PM 12: 23
ARMY CORPS ENGINEERS
PITTSBURGH DISTRICT

February 20, 2009

Mr. Scott Hans, Chief
U.S. Army Corps of Engineers, Regulatory Branch
1834 Federal Office Building, 1000 Liberty Avenue
Pittsburgh, PA 15222

**Attn: Marcia Haberman**

**RE: Glacial Sand and Gravel Co. – Mine 47**
**Surface Mine Permit Area**
**Worth Township, Butler County**
**Section 404 Permit Application**

Ladies and Gentleman:

Enclosed is an Application for Department of The Army – Section 404 Permit for your review and consideration. Also included are copies of the PA DEP Module 14(s) and either clearance letters or reports for archaeology and E & T species. We are currently waiting on PA DCNR's clearance letter for Mr. Fred Brenner's and Mr. James Bissell's plant survey reports.

Also, please note that the page numbers on the enclosed plan pages are not sequential because they have been pulled from a larger set of plans that are part of the mining permit package.

Please contact me or Michal Jones either by telephone at 814-764-5050 or e-mail at ddavis@eadsgroup-clarion.com or mjones@eadsgroup-clarion.com if you have any questions or need additional information.

Sincerely,

The EADS Group, Inc. (Clarion)

By: Derwood B. Davis, Jr.
Environmental Specialist

Cc: Darrel Lewis – Glacial Sand & Gravel Co.

2008-280 ~~2009-426~~ Marcia

☐ 1126 Eighth Avenue, Altoona, PA 16602, (814) 944-5035, (814) 944-4862 Fax
■ 15392 Route 322, Clarion, PA 16214, (814) 764-5050, (814) 764-5055 Fax
☐ 227 Franklin St., Suite 208, Johnstown, PA 15901, (814) 535-5388, (814) 535-7654 Fax
☐ 450 Aberdeen Drive, Somerset, PA 15501, (814) 445-6551, (814) 443-2748 Fax
☐ 11045 Parker Drive, North Huntingdon, PA 15642, (412) 754-0801, (412) 754-0860 Fax
☐ 81 Baltimore St., Suite 600, Cumberland, MD 21502, (301) 777-7878, (301) 777-8391 Fax

| APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT (33 CFR 325) | OMB APPROVAL NO. 0710-003 |
|---|---|

Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, Searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-003), Washington, DC 20503. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

## PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404. Principal Purpose: These laws require permits authorizing activities in, or affecting, navigable waters of the United States; the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Routine uses: Information provided on this form will be used in evaluating the application for a permit. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the proposed activity. An application that is not completed in full will be returned.

## (ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

| 1. APPLICATION NO. | 2. FIELD OFFICE CODE | 3. DATE RECEIVED | 4. DATE APPLICATION COMPLETED |
|---|---|---|---|
| | | | |

## (ITEMS BELOW TO BE FILLED BY APPLICANT)

| | |
|---|---|
| 5. APPLICANT'S NAME<br>Glacial Sand and Gravel Company | 8. AUTHORIZED AGENT'S NAME & TITLE (an agent is not required)<br>Darrel K. Lewis, Engineer |
| 6. APPLICANT'S ADDRESS<br>P.O. Box 1022<br>Kittanning, PA 16201 | 9. AGENT'S ADDRESS<br>P.O. Box 1022<br>Kittanning, PA 16201 |
| 7. APPLICANT'S PHONE NUMBERS WITH AREA CODE<br>a. Residence<br>b. Business 724-548-8101 | 10. AGENT'S PHONE NUMBERS WITH AREA CODE<br>a. Residence<br>b. Business 724-548-8101 |

11. STATEMENT OF AUTHORIZATION

I hereby authorize The EADS Group, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE — DATE 09-10-08

## NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Mine No. 47.

| | |
|---|---|
| 13. NAME OF WATERBODY, IF KNOWN (if applicable)<br>Unnamed Tributaries to Black Run | 14. PROJECT STREET ADDRESS (if applicable)<br>West liberty Road<br>Worth Township, Butler County |
| 15. LOCATION OF PROJECT<br>Butler (COUNTY) — PA (STATE) | |

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

The site is located 1.7 miles west of the Borough of West Liberty along West Liberty Road (T-860).

17. DIRECTIONS TO THE SITE

From Pittsburgh take I-79 north to Interchange 29, travel east on State Route 0422 to State Route 0528, travel north on State Route 0528 approximately 5.4 miles to State Route 4011 (West Liberty Road), make a left onto State Route 4011 (West Liberty Road) and travel north approximately 2.2 miles to the Borough of West Liberty, turn left onto T-860 (West Liberty Road) and travel approximately 1.7 miles to the project area on both sides of the road.

18. NATURE OF ACTIVITY (Description of project, include all features)

The proposed project consists of surface mining for sand and gravel. The proposed permit area is 77.6 acres. A processing plant will be constructed within the permit area to wash and screen the various grades of aggregate material and stockpile this material. These ponds are needed to provide a sufficient supply of plant processing water that will also allow for re-cycling the wash water as well. A total of 5,922 cubic yards of fill will be used to construct the wash water ponds.

19. PROJECT PURPOSE (Describe the reason or purpose of the project, see instructions)

The purpose of this project is to extract sand and gravel material from the permit area and process it for marketable aggregates to sell to industry.

## USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. REASON(S) FOR DISCHARGE

The construction of the processing plant proposes to excavate and place fill material into 1.77 acres of wetlands in order to build the wash water storage ponds. Refer to the attached Module 14 Streams/Wetlands South of West Liberty Road - 14.4 Wetland Impact Analysis/Assessment.

21. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS

The material that the wash water storage ponds will be built out of will consist of silt loam and silty clay material. The use of liners will be considered to prevent leaking or seepage within the embankments. Refer to the attached Erosion and Sedimentation Pollution Control Plan.

22. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (see instructions)

The surface area affected by this fill activity is 1.77 acres of jurisdictional wetlands. Refer to the attached Module 14 Streams/Wetlands South of West Liberty Road - 14.5 Wetland Mitigation/Replacement.

23. IS ANY PORTION OF THE WORK ALREADY COMPLETE? YES ○ NO ◉ IF YES, DESCRIBE THE WORK

24. ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC. WHOSE PROPERTY ADJOINS THE WATERBODY (If more than can be entered here, please attach a supplemental list)

Jaime L. Cooper, 110 Swope Road, Slippery Rock, PA, 16057 Claire Pizor, 1310 Moore Road, Slippery Rock, PA, 16057 P A Musulin, 128 Mount Union Road, Portersville, PA, 16051 Wayne A Pizor, 141 Mount Union Road, Portersville, PA, 16051 Carl S Rodgers, Jr., 1016 West Liberty Road, Slippery Rock, PA, 16507 Brian R Rea, 1073 West Liberty Road, Slippery Rock, PA, 16057 Carol A Miller, 1153 West Liberty Road, Slippery Rock, PA 16057

25. LIST OF OTHER CERTIFICATIONS OR APPROVALS/DENIALS RECEIVED FROM OTHER FEDERAL, STATE, OR LOCAL AGENCIES FOR WORK DESCRIBED IN THIS APPLICATION

| AGENCY | TYPE APPROVAL* | IDENTIFICATION NUMBER | DATE APPLIED | DATE APPROVED | DATE DENIED |
|---|---|---|---|---|---|
| None | | | | | |

* Would include but is not restricted to zoning, building and flood plain permits.

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

| SIGNATURE OF APPLICANT | DATE | SIGNATURE OF AGENT | DATE |
|---|---|---|---|
| [signature] | 09-10-08 | | |

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and will fully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, facticious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

# Module 14: Streams/Wetlands
# Unnamed Tributary #1 to Black Run

### *14.1 Mining Activities Within 100 Feet of a Stream*

*If the mining activities, including haul road crossings, are proposed within 100 feet of an intermittent or perennial stream provide the following information: (**Note**: Variance request for the expansion of pits must be included in the proof of publication. A separate Module 14.1 should generally be completed for each proposed encroachment.)*

a) *Name and location of the stream; and location, length, and acreage disturbed by the proposed activities (Identify the location of the proposed activities on Exhibits 9 and 18);*

Encroachment is proposed within the 100' stream barrier of perennial Unnamed Tributary #1 to Black Run. This stream is located along the western portion of the proposed permit area and to some extent parallels Mt Union Road (T-861). This stream section isolates the northwest corner of the permit area from the main project area. An encroachment up to 50 feet from the tributary is requested for support activities including the construction of a berm to act as an Erosion and Sedimentation Control Structure . The length of this request is 650'. The final Polishing Pond (Pond 5) is also proposed to be placed within the 100' barrier. This pond will act as the re-charge pond for the plant operations as well as an upslope sediment pond for the site. The total area within the variance area is approximately 1.3 acres.

*A narrative giving a description and the purpose and justification of the proposed activities;*

A 50' stream barrier is proposed to accommodate support activities which will enable a safer and more efficient working environment. Current operational area limitations reduce the area for potential support activities such as the processing plant and processing ponds. Preparation for a portion of the processing area will require the removal of some raw material from within the mining limits. To minimize the stockpiling and rehandling of this material maximum usage of the area outside the mining limits is requested. No mineral removal is proposed within 100' of this tributary.

b) *A hydrologic and hydraulic analysis which shall include: data on size, shape and characteristics of the watershed; the size and frequency of the design storm; the hydraulic capacity of any structures; the hydraulic capacity of the channel upstream and downstream; and, where flooding is a problem, flood damage and backwater analysis;*

At the downstream end of the encroachment area, the watershed drainage area is approximately 105 Ac and is comprised of a combination of cropland and non-commercial forestland. This area is currently fully vegetated and has an average slope of approximately 10%. Streambed slope within the variance area is approximately 4%.

Using a CN value of 65, the following storm data has been generated:

| | |
|---|---|
| $P_2$ = 2.6" | $Q_2$ = 15 cfs |
| $P_{10}$ = 3.8" | $Q_{10}$ = 57 cfs |
| $P_{25}$ = 4.3" | $Q_{25}$ = 85 cfs |
| $P_{50}$ = 4.8" | $Q_{50}$ = 112 cfs |

Since no structures are proposed to be placed in the stream channel, hydraulic capacities and backwater analysis are not necessary.

c) *A description of the character of the stream bed and banks, and a profile of the stream for a reasonable distance above and below the proposed site showing bed slopes, normal and flood water surfaces; and a description of the riparian vegetation;*

The stream bottom material consists of primarily sand, silt, and gravel cobbles, with a bed slope of approximately 4%. This drainage course is linear with few bends to slow discharge. The upper end of this stream encroachment is marked by the outfall of a 24" CMP which crosses Mt. Union Road. Based on the size of this existing culvert, significant flows to cause flooding do not visually appear to occur regularly. Stream banks, composed of silts and sand, are stabilized by stream side vegetation. Riparian vegetation consists of Multi Floral Rose, Jewelweed, Skunk Cabbage, scrub brush, and young mixed deciduous trees. Please see attached detail for plan view and cross sections with channel capacities.

d) *A plan and typical cross-sections showing stream channel and existing ground, activities proposed, barriers to be maintained, and normal and flood water surfaces;*

Please see attached detail, including sections D-F

e) *Where a bridge, culvert or other water obstruction is proposed, provide the following information:*

No water obstructions are proposed within this variance request.

1) *Plans and details showing the location, type, size, and height of the structure;*

2) *Calculations showing the hydraulic capacity of the structure;*

3) *A profile of the streambed for a reasonable distance above and below the proposed location showing normal and flood water surface elevations and backwater effects of the structure;*

4) *Cross-sections upstream, downstream, and at the proposed location of the structure showing normal and flood water surface elevations and other topographic features, elevations, etc., necessary for an appraisal of the hazard potential of the structure;*

5) *A narrative description of the construction methods and sequence including water handling during construction, and erosion and sedimentation controls;*

6) *Indicate if the structure will be temporary or permanent (include plans for removal of temporary structures).*

g) *A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code Chapter 93 Protected Water Use Classification.*

***(Note:** General Permit (BMR-GP-102) is available for construction of access roads.)*

Unnamed tributary #1 to Black Run is classified as CWF, by Chapter 93 designation of Slippery Rock Creek. There are no designated downstream uses. Water quantity and quality are sufficient to sustain aquatic invertebrates. Upstream farming and timbering practices have been observed to temporarily affect turbidity within this stream. Otherwise, laboratory analysis indicate no water quality concerns.

### *14.2 Stream Relocation and Channel Changes* Does Not Apply

*If the proposed mining activities involve a relocation or channel change of an intermittent or perennial stream provide the following information (**Note**: Stream variance request must be included in the proof of publication):*

a) *Name and location of stream and location and length of the proposed channel change (identify the location of the proposed activities on Exhibits 9 and 18);*

b) *A narrative giving a description and the purpose and justification of the proposed relocation or channel change;*

c) *A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code, Chapter 93 Protected Water Use Classification;*

d) *A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities. Provide the name(s), address(es) and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data;*

e) *A hydrologic and hydraulic analysis which includes;*

1) Data on size, shape and characteristics of the watershed;
2) The size and frequency of the design storm;
3) The hydraulic capacity of the proposed replacement channel;
4) The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.

f) *A stream profile for the existing and proposed channel for a reasonable distance upstream, downstream and within the proposed change, showing bed slopes, pool-riffle ratios, normal and flood water surfaces, and existing obstructions;*

g) *A detailed plan and cross-sections of the existing and proposed channel upstream, downstream and within the proposed channel change showing the limits and configuration of the proposed activities, dimensions, channel linings, and normal and flood water surfaces;*

h) *A description of the construction methods and sequence including: water handling during construction, erosion and sedimentation controls, and measures to be taken to prevent adverse impacts to water quality and quantity, water users and the aquatic communities.*

# Module 14: Streams/Wetlands
# Unnamed Tributary #3 to Black Run

### *14.1 Mining Activities Within 100 Feet of a Stream*

*If the mining activities, including haul road crossings, are proposed within 100 feet of an intermittent or perennial stream provide the following information: (**Note**: Variance request for the expansion of pits must be included in the proof of publication. A separate Module 14.1 should generally be completed for each proposed encroachment.)*

f) *Name and location of the stream; and location, length, and acreage disturbed by the proposed activities (Identify the location of the proposed activities on Exhibits 9 and 18);*

Encroachment is proposed within the 100' stream barrier of intermittent Unnamed Tributary #3 to Black Run.

Access to the proposed mine site will require a stream crossing directly south of the intersection of West Liberty Road (T-860) and Swope Road (T-372). A 50' wide corridor is proposed to cross the stream barrier for this road and associated support activities. The maximum area of disturbance for this crossing will be approximately 0.2 Ac.

In addition, the placement of a polishing pond is proposed to be placed in within the 100' barrier immediately prior to the streams juncture with the Unnamed Tributary #1 to Black Run and a process pond to be placed in the headwaters of the stream. The total disturbed area for both activities associated with the water handling system is approximately 0.9 acres.

g) *A narrative giving a description and the purpose and justification of the proposed activities;*

Access to this operation will be from West Liberty Road, at the intersection with Swope Road, as requested by Worth Township officials. This location was chosen for safety purposes due to maximum visibility in both directions of West Liberty Road. From this site entrance it will be necessary to cross Unnamed Trib #3, an intermittent stream flowing from the wetland on property 6. An appropriately sized culvert will be placed in the channel to allow the roadbed to be constructed with minimal disturbance to the channel.

Placement of Pond 5 (Polishing Pond) is required due to the plant location and support site constraints. The placement of Process Pond # 3 in the headwaters of the stream is also required due to the site constraints and the elimination of a small wetland complex. (Please see below).

h) *A hydrologic and hydraulic analysis which shall include: data on size, shape and characteristics of the watershed; the size and frequency of the design storm; the hydraulic capacity of any structures; the hydraulic capacity of the channel upstream and downstream; and, where flooding is a problem, flood damage and backwater analysis;*

The current watershed drainage area for the proposed stream crossing is 30 Ac which is comprised of primarily cropland. This area is currently fully vegetated and has an average slope of approximately 10%. Streambed slope within the variance area is approximately 2%.

Using a CN value of 65, the following storm data has been generated:

| | |
|---|---|
| $P_2$ = 2.6" | $Q_2$ = 6.5cfs |
| $P_{10}$ = 3.8" | $Q_{10}$ = 24 cfs |
| $P_{25}$ = 4.3" | $Q_{25}$ = 35 cfs |
| $P_{50}$ = 4.8" | $Q_{50}$ = 46 cfs |

During the mining activities at the site the wetland recharge area will be eliminated and installation of the process ponds effectively reducing the stream channel to an ephemeral classification flowing only in response to storm events.

i) *A description of the character of the stream bed and banks, and a profile of the stream for a reasonable distance above and below the proposed site showing bed slopes, normal and flood water surfaces; and a description of the riparian vegetation;*

The stream bottom material consists of primarily sand, silt, and gravel, with a bed slope of approximately 2%. This drainage way appears to have been manipulated (mechanically dug drainage ditch) at some point as the cross sectional area of the channel is consistent along the entire linear length from the wetland source to Unnamed Trib #1. Riparian vegetation consists of Golden Rod, vines, briars, scrub brush, and young mixed deciduous trees. Please see attached detail for plan view and cross sections with channel capacities.

*A plan and typical cross-sections showing stream channel and existing ground, activities proposed, barriers to be maintained, and normal and flood water surfaces;*

Please see attached detail, including cross sections and profiles for both the stream crossing and the pond installation.

f) *Where a bridge, culvert or other water obstruction is proposed, provide the following information:*

7) *Plans and details showing the location, type, size, and height of the structure;*

Please see attached exhibit sheets submitted as part of the permit application.

8) *Calculations showing the hydraulic capacity of the structure;*

Stream Crossing

Please see the attached rating table for a 24" plastic culvert placed on a 2.5% slope. These calculations were computed by Haestad software.

Polishing Pond and Process Ponds

The Hydrologic calculations for the Process Ponds and Polishing Pond are found in Module 13. There will be no direct discharge to the stream from the ponds unless the emergency spillways are activated during high flow event.

9) *A profile of the streambed for a reasonable distance above and below the proposed location showing normal and flood water surface elevations and backwater effects of the structure;*

Stream Crossing

Please see attached detail

Polishing Pond and Process Ponds

Cross-section A-A' is provided for Pond 5 (Polishing Pond). Cross-sections and a profile are provided for the Process Ponds 3 and 4.

10) *Cross-sections upstream, downstream, and at the proposed location of the structure showing normal and flood water surface elevations and other topographic features, elevations, etc., necessary for an appraisal of the hazard potential of the structure;*

Please see attached detail

11) *A narrative description of the construction methods and sequence including water handling during construction, and erosion and sedimentation controls;*

Stream Crossing

Erosion and sedimentation controls will consist of both permanent and temporary measures. Initial construction will not begin until all necessary materials have been assembled at the site and at a time of low stream flow. Staked filter fencing will be placed downslope of the construction area prior to the initiation of any earth moving activities. The filter fencing will remain in place until all areas of disturbance have been stabilized by either rock cover or the establishment of a permanent vegetative cover.

Preparation of the crossing area will be conducted from the banks of the stream using a backhoe or similar equipment. At no time will equipment be in the channel itself. This preparation will consist of the smoothing of the stream bed itself for culvert placement. Once the culvert is in place, dumped rock (non-toxic) will be placed around and over the culvert. The fill will be compacted in 8" lifts by either the equipment on site or by hand. Rock rip-rap (R4) will be placed both up and down stream of the culvert at the outlet of the culvert and to line the banks adjacent to the newly installed crossing. Stone fill will be added as part of the cartway construction to further ensure stability of the road surface and control the sediment losses from the road in the encroachment area.

Any areas which have not been stabilized by rip-rap will be seeded with a permanent vegetative cover as found in the re-vegetation module of this permit or by an equivalent seed mixture.

Access road drainage will be controlled by either being upslope of other controls or by the inclusion of level spreaders located adjacent to the stabilized stream banks.

Polishing Pond and Process Ponds

Silt fencing will be placed downslope of the proposed pond embankment construction areas. Once the embankments have been built they will be seeded and mulched immediately as outlined in Module 23 of this application. The silt fencing will remain in place until the embankments have been stabilized by a minimum 70% permanent cover.

12) *Indicate if the structure will be temporary or permanent (include plans for removal of temporary structures).*

Stream Crossing

This structure will be permanent as to provide access to the property, which is owned by the operator.

Polishing Pond and Process Ponds

These ponds will remain as part of the post mining land use once the mining has been completed.

g) *A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code Chapter 93 Protected Water Use Classification.*

***(Note:** General Permit (BMR-GP-102) is available for construction of access roads.)*

Unnamed tributary #3 to Black Run is classified as CWF, by Chapter 93 designation of Slippery Rock Creek. There are no designated downstream uses. Under seasonal conditions, the volume of water within this channel is minimal to non-existent. Only after periods of substantial precipitation does this channel convey surface water readily. Water quality is characteristic of wetland drainage.

### *14.2 Stream Relocation and Channel Changes*

**Does Not Apply**

*If the proposed mining activities involve a relocation or channel change of an intermittent or perennial stream provide the following information (**Note**: Stream variance request must be included in the proof of publication):*

*a) Name and location of stream and location and length of the proposed channel change (identify the location of the proposed activities on Exhibits 9 and 18);*

*b) A narrative giving a description and the purpose and justification of the proposed relocation or channel change;*

*c) A characterization of the existing water quality and quantity of the stream including downstream water uses, and 25 Pa Code, Chapter 93 Protected Water Use Classification;*

*d) A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities. Provide the name(s), address(es) and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data;*

*e) A hydrologic and hydraulic analysis which includes;*

1) Data on size, shape and characteristics of the watershed;
2) The size and frequency of the design storm;
3) The hydraulic capacity of the proposed replacement channel;
4) The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.

*f) A stream profile for the existing and proposed channel for a reasonable distance upstream, downstream and within the proposed change, showing bed slopes, pool-riffle ratios, normal and flood water surfaces, and existing obstructions;*

*g) A detailed plan and cross-sections of the existing and proposed channel upstream, downstream and within the proposed channel change showing the limits and configuration of the proposed activities, dimensions, channel linings, and normal and flood water surfaces;*

*h) A description of the construction methods and sequence including: water handling during construction, erosion and sedimentation controls, and measures to be taken to prevent adverse impacts to water quality and quantity, water users and the aquatic communities.*

# Module 14: Streams/Wetlands
## North of West Liberty Road
### Wetland No. 1

**14.3 *Wetland Related Information***

a) *Provide the name(s), address(es), telephone number(s) and qualifications of the person(s) who made the determination if wetlands exist within the proposed permit area.*

**Derwood B. Davis (Biologist), The EADS Group, Inc., 15392 Rt 322, Clarion, PA 16214**

b) *Show the location of wetlands on Exhibits 6.2, 9 and 18.*

**Wetlands have been identified on the exhibit maps (Attached).**

c) What is the total wetland acreage (which will be affected) for the proposed permit area? **0** acres.

d) *Provide responses to the following for each wetland which will be affected by the proposed mining activities:*

*Exceptional Value Wetland Characteristics*

1) *Does the wetland serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?* ☐ yes ☒ no

2) *Is the wetland hydrologically connected to or located within 1/2 mile of the wetlands identified in d)1) and does it maintain the habitat of the "threatened" or "endangered" species within the wetlands identified in d)1) above)?* ☐ yes ☒ no

***NOTE:*** *If this wetland is located more than 1000 feet from the permit area, show its location (and the location of the wetland that is hydrologically connected to or located within ½ mile of) on the Exhibit 6.1 Map.*

3) *Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream?* ☐ yes ☒ no

4) *Is the wetland located in or along the floodplain of a stream listed as exceptional value (under 25 Pa Code Chapter 93) or the floodplain of a tributary to an exceptional value stream?* ☐ yes ☒ no

5) *Is the wetland within the corridor of a waterway which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act?* ☐ yes ☒ no

6) *Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply?* ☐ yes ☒ no

7) *Is the wetland located in areas designated by the Department as "natural" or "wild" areas within state forest or park lands?* ☐ yes ☒ no

8) *Is the wetland located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?* ☐ yes ☒ no

9) *Is the wetland located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935?* ☐ yes ☒ no

***NOTE:*** *If a "yes" response is indicated for any question in d)1) through d)9), the wetlands would be "exceptional value" (as defined in 25 Pa Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25 Pa Code Section 105.18(a) have been met.*

*Wetland Functions*

| | | | |
|---|---|---|---|
| 10) | *Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, or resting sites for aquatic or land species?* | ☒ yes | ☐ no |
| 11) | *Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?* **Slippery Rock University uses this site.** | ☒ yes | ☐ no |
| 12) | *Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns or other environmental characteristics?* | ☒ yes | ☐ no |
| 13) | *Does the wetland serve as storage areas for flood and storm waters, or does it shield other areas from erosion or storm damage?* | ☒ yes | ☐ no |
| 14) | *Does the wetland provide a groundwater recharge area that maintains minimum baseflows?* **This wetland is supported by spring outcrops from a perched water table; providing recharge to an unnamed tributary.** | ☐ yes | ☒ no |
| 15) | *Does the wetland serve as a prime natural recharge area where surface water and groundwater are directly connected?* | ☒ yes | ☐ no |
| 16) | *Does the wetland aid in the prevention of pollution?* **This wetland has the potential however, significant pollutant sources are lacking within the upstream area.** | ☒ yes | ☐ no |
| 17) | *Is the wetland used for, or does it provide the opportunity to be used for recreation?* **This wetland is not open to the public.** | ☐ yes | ☒ no |

e) *If a "yes" response is indicated for the question in d)1) or d)2), identify how the determination was made and indicate any contacts with state or federal agency personnel.*

### *14.4 Wetland Impact Analysis/Assessment*

**This Wetland Community will not be permanently impacted by the proposed mining.**

a) *Describe the alternatives to the proposed mining activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (e.g. relocating spoil/topsoil storage areas, rerouting haul roads).*

b) *Discuss whether any of the alternatives are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites which would not affect the wetlands.*

c) *If any wetlands within the proposed permit area will be directly affected, provide the following:*

1) *Identify and delineate the wetland and the areal extent of the impact (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and delineation of wetlands – statement of policy).*

2) *Submit a cross-sectional view showing the wetland and the proposed mining area.*

3) *Explain how the proposed mining activities will directly affect the wetlands.*

aa) *If the proposed mining activities will affect less than 1.0 acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 Pa Code Section 105.17), provide a description of the wetland functions which will be impacted by the proposed mining activities.* ***Note:*** *If a "yes" response is indicated for any question in Module 14.3 d)1) through d)9), the wetlands would be exceptional value (as defined in Section 105.17).*

bb) *If the proposed mining activities will affect 1.0 or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions identified in Module 14.3 d)10) through d)17).*

d) *If any wetlands within the proposed permit or adjacent area will be indirectly affected (e.g. altering the wetland hydrology), provide the following:*

1) *Identify and delineate the wetland and provide an estimate of the total wetland acreage affected (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and Delineation of Wetlands – statement of policy).*

2) *A description of how the proposed mining activities will indirectly affect the wetlands.*

e) *Will the cumulative impact of the proposed and anticipated mining activities result in a major impairment of the wetland resource in the general area?* ☐ yes ☐ no

*Provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.*

## *14.5 Wetland Mitigation/Replacement*

**This wetland community will not be affected therefore; no mitigation is required.**

***Note:*** *If a total of one-half (.5) acres or less of wetlands will be affected, participation in Pennsylvania's Wetlands Replacement Project may be authorized by the Department in lieu of onsite replacement of the wetlands.*

a) *If wetland mitigation measures or wetland replacement are proposed, address the following:*

1) *Identify the wetlands where mitigation measures will be employed.*

2) *Identify the wetlands that will be replaced and the location of the replacement wetland site. Provide the number of acres for each wetland to be replaced and the acreage of the replacement wetland.*

3) *Provide a plan for mitigation/replacement following the guidelines in the Department's technical guidance titled*

*"Design Criteria - Wetlands Replacement Monitoring" document 363-0300-001. This guidance is available from the Division of Waterways, Wetlands and Erosion Control, Post Office Box 8854, Harrisburg, Pennsylvania 17105-8554 or through the Department's Web Site.*

*Show the location of replacement wetland sites on the Operations Map (Exhibit 9) and the Land Use and Reclamation Map (Exhibit 18).*

***Note:*** *At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres). The Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected. Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.*

# Module 14: Streams/Wetlands
## South of West Liberty Road
### Wetlands No. 2, 3 and 4

**14.3 *Wetland Related Information***

a) *Provide the name(s), address(es), telephone number(s) and qualifications of the person(s) who made the determination if wetlands exist within the proposed permit area.*

**Derwood B. Davis (Biologist), The EADS Group, Inc., 15392 Rt 322, Clarion, PA 16214**

b) *Show the location of wetlands on Exhibits 6.2, 9 and 18.*

**Wetlands have been identified on the exhibit maps (Attached).**

c) What is the total wetland acreage (which will be affected) for the proposed permit area? **1.84** acres.

d) *Provide responses to the following for each wetland which will be affected by the proposed mining activities:*

*Exceptional Value Wetland Characteristics*

1) *Does the wetland serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?* ☐ yes ☒ no

2) *Is the wetland hydrologically connected to or located within 1/2 mile of the wetlands identified in d)1) and does it maintain the habitat of the "threatened" or "endangered" species within the wetlands identified in d)1) above)?* ☐ yes ☒ no

***NOTE:*** *If this wetland is located more than 1000 feet from the permit area, show its location (and the location of the wetland that is hydrologically connected to or located within ½ mile of) on the Exhibit 6.1 Map.*

3) *Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream?* ☐ yes ☒ no

4) *Is the wetland located in or along the floodplain of a stream listed as exceptional value (under 25 Pa Code Chapter 93) or the floodplain of a tributary to an exceptional value stream?* ☐ yes ☒ no

5) *Is the wetland within the corridor of a waterway which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act?* ☐ yes ☒ no

6) *Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply?* ☐ yes ☒ no

7) *Is the wetland located in areas designated by the Department as "natural" or "wild" areas within state forest or park lands?* ☐ yes ☒ no

8) *Is the wetland located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?* ☐ yes ☒ no

9) *Is the wetland located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935?* ☐ yes ☒ no

***NOTE:*** *If a "yes" response is indicated for any question in d)1) through d)9), the wetlands would be "exceptional value" (as defined in 25 Pa Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25*

*Pa Code Section 105.18(a) have been met.*

*Wetland Functions*

10) *Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, or resting sites for aquatic or land species?* **These wetland communities would provide some food chain production and general habitat for terrestrial and semi-aquatic species only.** ☒ yes ☐ no

11) *Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?* **These wetlands are on private property and are not designated for study or resource protection.** ☐ yes ☒ no

12) *Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns or other environmental characteristics?* **These wetlands do provide some natural drainage of surface and ground waters to a tributary that establishes local surface water flow patterns.** ☒ yes ☐ no

13) *Does the wetland serve as storage areas for flood and storm waters, or does it shield other areas from erosion or storm damage?* **These wetlands contain a moderate grade to the northwest and a defined outlet that discharges water to tributaries. They are not part of a major waterway that floods.** ☐ yes ☒ no

14) *Does the wetland provide a groundwater recharge area that maintains minimum baseflows?* **These wetlands are supported by spring outcrops from a perched water table; providing recharge to an unnamed tributary.** ☐ yes ☒ no

15) *Does the wetland serve as a prime natural recharge area where surface water and groundwater are directly connected?* **These wetlands contain a defined outlet and are supported by spring outcrops.** ☒ yes ☐ no

16) *Does the wetland aid in the prevention of pollution?* **These wetlands have the potential however, significant pollutant sources are lacking within the upstream area.** ☒ yes ☐ no

17) *Is the wetland used for, or does it provide the opportunity to be used for recreation?* **These wetlands are located on private property and are not open to the general public.** ☐ yes ☒ no

e) *If a "yes" response is indicated for the question in d)1) or d)2), identify how the determination was made and indicate any contacts with state or federal agency personnel.*

### 14.4 Wetland Impact Analysis/Assessment

a) *Describe the alternatives to the proposed mining activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (e.g. relocating spoil/topsoil storage areas, rerouting haul roads).*

**Alternatives considered as part of this permit were: No Mining, Mining with Wetland Avoidance and Mining with Wetland Impacts.**

b) *Discuss whether any of the alternatives are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites which would not affect the wetlands.*

**The No Mining Alternative is a feasible alternative but was considered not prudent due to the fact that Glacial Sand & Gravel currently owns the permit area and this alternative would not permit them to regain their investment and continue to provide aggregate products to a highly demanding market. Mining with Wetland Avoidance is not considered feasible or prudent due to the required area for constructing a processing plant,**

the required area to construct sufficient wash water storage ponds to supply the processing plant and the inability to fit these required areas within an area that does not hinder the extraction of aggregate material and at the same time prevent wetland impacts. The location of the processing plant and storage ponds are located in an area that contains lower volumes of aggregate material in comparison to the rest of the permit area. The location of the storage ponds is such that permits the collection of as much surface water runoff as possible. Likewise, this area is selected for the construction of the processing plant and wash water ponds because it will not interfere with the extraction of aggregate material that economically supports the mobilization of mining equipment and the actual mining activity.

Re-locating the processing plant and wash water ponds in order to avoid impacting the wetland was evaluated and considered not feasible or prudent based on the following reasons: 1) Re-location of the wash water storage ponds would require shifting the location of the processing plant in order to fit both operations within this area of the permit. This results in an economical loss of aggregate material that could be mined during the proposed mining phases and 2) Construction of the processing plant and wash water ponds in order to not interfere with the extraction of marketable aggregate would need to be done within the upslope areas of the wetlands. Field observations of the hydrological regime that supports this wetland community indicates this wetland is supported predominantly by a perched water table that outcrops in several places along the upper boundary line of the wetland community.

This consensus is supported by the observation of the drying up of these springs and lack of visible water within the wetland community during the spring and summer of 2007. Test hole and monitoring well information upslope of the wetland community reveals there are varying clay and silty clay layers immediately below the surface and ground water elevations were recorded to be at elevations from 1216 to 1218. The surface elevation within the wetland community ranges from 1218 to 1222. These impervious layers are believed to exist below the wetland community and as a result form a bowl whereby ground water and surface water remains perched. Plant and wash water storage pond construction within the upslope area of the wetland community will negatively impact the wetland community due to: 1) diverting all surface water runoff around the processing plant to the wash water storage ponds, likewise around the wetland community as well and 2) Excavation into the hillside to construct the subgrade for the processing plant and wash water storage ponds will break these clay barriers and intercept the shallow ground water table lying below. This would have a negative impact on the wetland community downgrade by intercepting and redirecting the predominant hydrology that supports this wetland.

Wetland avoidance was also evaluated with a sub-alternative that eliminated the collection of surface water runoff and the construction of wash water storage ponds. This alternative depends solely on well water to provide the required wash water. This alternative would still have an indirect impact on the wetland community as well as a direct impact to surface water quality. The function of and need for wash water ponds is to: 1) recycle and store sufficient wash water from the processing plant that will conserve the use of and reduce the need for replacement water; 2) reduce the demand on groundwater resources from pumping water from wells to the processing plant and; 3) prevent sediment laden water from being discharged into adjoining tributaries. Construction of the processing plant will still result in the breaking up of the clay barrier that lies immediately underneath and the interruption of the shallow ground water table. This affect will again negatively impact the wetland community located downgrade. Providing the required water to operate the processing plant by using wells without recycling any wash water would likely result in a significant draw down of the ground water table. This again would negatively impact the wetland community. Sediment laden waters which would still require a detention basin to remove the sediment before discharging would potentially impact adjacent tributaries.

The Mining with Wetland Impacts alternative was considered feasible and prudent and reducing impacts to the wetland community is not feasible due to spatial constraints, already proposing the minimum wash water storage pond volume needed to support the processing plant and the unavoidable impact to the perched water table within the upstream area by plant construction. This alternative remains to be the alternative that achieves the goals and objectives of Glacial Sand & Gravel with the least environmental impact as a whole based on the following reasons: 1) It permits Glacial Sand & Gravel to streamline the mining process and extract the full intent of marketable aggregate within the permit area; 2) It provides the minimum required amount of wash water storage and recycling to support the processing plant therefore, reducing the draw on groundwater resources within and surrounding the permit area; 3) It provides a means to handle stormwater from the plant area and at the same time promotes water conservation as part of the plant operation; and 4) It provides detention time to settle out sediment and significantly reduces the need to discharge sediment laden waters to nearby tributaries.

c) *If any wetlands within the proposed permit area will be directly affected, provide the following:*

1) *Identify and delineate the wetland and the areal extent of the impact (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and delineation of wetlands – statement of policy).*

**The affected wetlands are shown on the attached site plan. The aerial extent of wetland impacts to these wetland communities by mining operations is 1.84 acres.**

2) *Submit a cross-sectional view showing the wetland and the proposed mining area.*

**Cross sections of these wetland communities and mining area are attached.**

3) *Explain how the proposed mining activities will directly affect the wetlands.*

**The mining activities will directly affect these wetland communities by excavation, fill placement and grading to construct a series of wash water storage ponds that have the capacity to store sufficient water for processing plant operations. These ponds will also have the capacity to retain water and settle out the sediment that will be suspended in the wash water.**

aa) *If the proposed mining activities will affect less than 1.0 acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 Pa Code Section 105.17), provide a description of the wetland functions which will be impacted by the proposed mining activities.* ***Note:*** *If a "yes" response is indicated for any question in Module 14.3 d)1) through d)9), the wetlands would be exceptional value (as defined in Section 105.17).*

bb) *If the proposed mining activities will affect 1.0 or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions identified in Module 14.3 d)10) through d)17).*

**Plant accumulation and decomposition occurring within these wetland communities would be broken down into organic and inorganic nutrients. The affected wetlands would provide carbon and other inorganic nutrients to the unnamed tributary immediately adjacent to as well as downstream reaches. The affected wetlands provides general habitat for terrestrial and semi-aquatic organisms. This community would provide food and cover for these organisms during most of the year. Aquatic habitat is not provided due to the lack of open water habitat for a sufficient time during the growing season. Pollution prevention would be moderately exhibited by the affected wetlands however, the well defined outlet, lack of significant open water, low vegetation/water interfacing, and lack of potential pollution sources upslope of these wetlands reduces the opportunity for these wetland communities to fully exhibit this function.**

d) *If any wetlands within the proposed permit or adjacent area will be indirectly affected (e.g. altering the wetland hydrology), provide the following:*

**Wetland No. 4 will also be temporarily affected by the proposed mining activity as a result of sanitary line construction (See attached Module 14 – Wetland No. 4 Temporary Impacts).**

1) *Identify and delineate the wetland and provide an estimate of the total wetland acreage affected (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and Delineation of Wetlands – statement of policy).*

2) *A description of how the proposed mining activities will indirectly affect the wetlands.*

e) *Will the cumulative impact of the proposed and anticipated mining activities result in a major impairment of the wetland resource in the general area?* ☐ yes ☒ no

*Provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.*

**The affected wetlands are small to medium sized, perched, wetland communites providing some function and values at varying levels. Impacts to these wetlands are site specific and will not result in cumulative impacts to wetland resources in the surrounding area.**

### *14.5 Wetland Mitigation/Replacement*

***Note:*** *If a total of one-half (.5) acres or less of wetlands will be affected, participation in Pennsylvania's Wetlands Replacement Project may be authorized by the Department in lieu of onsite replacement of the wetlands.*

a) *If wetland mitigation measures or wetland replacement are proposed, address the following:*

1) *Identify the wetlands where mitigation measures will be employed.*

**Upon completion of the extraction of aggregate material located between West Liberty Road (T-860), Swope Road (T-382) and the large wetland community north and northeast of the permit area, the affected wetlands will be replaced as part of the reclamation of this immediate area. The Wetland Mitigation Plan can be found on the attached site plan and Cross Sections are included.**

2) *Identify the wetlands that will be replaced and the location of the replacement wetland site. Provide the number of acres for each wetland to be replaced and the acreage of the replacement wetland.*

**The wetlands that will be replaced are classified as a Palustrine, Persistent, Emergent and Scrub Shrub, Broad-leaved Deciduous communities that are located within the upper reach of an unnamed tributary to Black Run. The wetland replacement site is located across West Liberty Road within the watershed of Black Run. The affected wetland acreage is calculated to be 1.84 acres and the proposed replacement acreage is calculated to be 1.90 acres.**

3) *Provide a plan for mitigation/replacement following the guidelines in the Department's technical guidance titled "Design Criteria - Wetlands Replacement Monitoring" document 363-0300-001. This guidance is available from the Division of Waterways, Wetlands and Erosion Control, Post Office Box 8854, Harrisburg, Pennsylvania 17105-8554 or through the Department's Web Site.*

**As per PA DEP Technical Guidance Document 363-0300-001 the following information is being provided:**

**The wetland mitigation plan proposes to replace the affected wetlands at a 1:1 ratio.**

**The wetland functions and values identified to be present within the affected wetlands will be replaced equally and in some cases to a greater extent (i.e. food chain production, general habitat, food/cover/nesting) within the proposed replacement plan due to its immediate location to the large wetland area to the north and northwest and ability to function in conjunction with this wetland. As a result its location, design and concurrent functions, other functions such as aquatic habitat, natural water filtration and pollution prevention are expected to be enhanced.**

**Wetland replacement will occur within the Black Run watershed directly across West Liberty Road upon completion of mining activities and reclamation of the Phase I mining activity.**

**The replacement plan will initially consist of a Palustrine, Persistent, Emergent wetland community, succeeding into a Scrub Shrub, Broadleaved Deciduous wetland community supported by a soil saturated and seasonally flooded hydrological regime.**

**Soil saturated conditions are expected to occur throughout the growing season from the surface to one (1) foot below the surface based on the existing data gathered during the delineation of the adjacent wetland community and exploratory test pit data. The site exhibits a perched water table that outcropped in many places along the upland/wetland boundary of the adjacent wetland community. This supporting hydrology will be intercepted by excavation and grading as part of the Phase I reclamation plan to create and maintain soil saturated areas. The final grade (el. 1200) will also be as such to permit temporary inundation in some portions of or the entire replacement site during storm events and seasonal fluctuations from surface water runoff. The interfacing of perched ground water and surface water is expected to provide soil saturated conditions throughout and beyond the growing season.**

**Soil conservation measures will be used to transfer the hydric soils from the affected wetlands into the**

replacement site. The top 12 inches of soil within the affected wetlands will be excavated and stockpiled as necessary until the replacement site is grading is completed. This soil stockpile will be covered with a tarp(s) to reduce evaporation and maintain moisture within the soil. Watering will be done on an as needed basis during the stock piling period. The stock piled hydric soil will be placed in the wetland replacement site and brought to grade (final grade elevation = 1200) as depicted on the Exhibit 18 and the attached Cross Sections. At a minimum this soil will act as a planting medium for the selected plant species; however this soil will contain a seed bank of indigenous hydrophytic plant species that, if properly stored, will likely germinate and proliferate within the wetland replacement site.

Plants and seed can be obtained from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA, 16335, 800-873-3321 or www.ernstseed.com. Exhibit 18 contains the planting plan proposed for the replacement site. Seed will be mechanically broadcasted on the replacement site and plant stock will be hand planted using a planting dibble or small shovel. Survival rate and percent aerial cover for seeded species are anticipated to be between 90 and 100 percent and survival rate and percent aerial cover for planted species are anticipated to be between 80 and 100 percent for survival and 75 to 90 percent for aerial cover after one (1) full growing season. The percent aerial cover at five (5) years of maturity is expected to be 100 percent and consisting of hydrophytic plant species.

Seed mix types that will be planted are OBL – FACW Perennial Food and Cover Wetland Mix (ERNMX-120) and Wildlife Food and Shelter Shrub Mix (ERNMX-138). The ERNMX-120 is composed of Fox sedge, *Carex vulpinoidea* (23%); Virginia wild rye, *Elymus virginicus* (20%); Giant bur reed, *Sparganium eurycarpum* (10%); Fringed (Nodding) sedge, *Carex crinita* (5%); Nodding sedge, *Carex gynandra* (5%); Hop sedge, *Carex lupulina* (5%); Lurid sedge, *Carex lurida* (5%); Blunt broom sedge, *Carex scoparia* (5%); Soft rush, *Juncus effusus* (5%); Wool grass, *Scirpus cyperinus* (5%); Eastern bur reed, *Sparganium americanum* (5%); Nodding bur marigold, *Bidens cernua* (3%); Cosmos bristly sedge, *Carex comosa* (2%); Rattlesnake grass, *Glyceria canadensis* (1%); and Rice cutgrass, PA Ecotype, *Leersia oryzoides, PA ecotype* (1%). The ERNMX-138 is composed of Fox sedge, *Carex vulpinoidea* (24%); Arrow wood, *Viburnum dentatum* (14%); Virginia wild rye, *Elymus virginicus* (11%); Lurid sedge, *Carex lurida* (10%); Silky dogwood, *Cornus amomum* (10%); Grey dogwood, *Cornus racemosa* (10%); Hop sedge, *Carex lupulina* (5%); Blunt broom sedge, *Carex scoparia* (7%); Hercules' club, *Aralia spinosa* (3%); Awl sedge, *Carex stipata* (2%); Cosmos bristly sedge, *Carex comosa* (1%); Buttonbush, *Cephalanthus occidentalis* (2%); and Meadow sweet, *Spiraea alba* (1%).

Rooted cuttings (8 to 12 inch heights) of Red-osier dogwood, *Cornus stolonifera*, Black willow, *Salix nigra*, and Silky willow, *Salix sericea* will be planted as specified on the planting plan details. These shrubs will be planted at 6 foot centers at the designated locations and quantities depicted on the attached planting plan. Shrub placement is intended to provide a border of shrub development around the seed herbaceous zone that will provide additional edge effect within the wetland mitigation site. This edge effect is enhanced due to the upland open field environment that will exist around the mitigation site.

Slopes throughout the wetland replacement site will be level. Upland slopes will approximate 17:1 (0.06 percent) on the north, northeast and southeast sides. On the south, southwest, northwest sides the upland slopes will approximate 3:1 (0.33 percent). The surface will be left rough to create micro environments that control and trap surface water as well as carbonaceous and inorganic nutrients.

Construction of the replacement site will begin concurrent with the Phase I post-mining reclamation. It is anticipated that upon beginning site reclamation activities, it will take one (1) week for construction stakeout, three (3) to four (4) weeks to complete the final grading of the wetland replacement site and three (3) weeks to complete seeding, planting and mulching.

One (1) year after the wetland replacement site is completed it will function in full capacity for drainage and flow patterns, stormwater retention, sediment stabilization and surface water discharge. Biological functions such as food chain production, aquatic and terrestrial habitat, nesting, spawning, and resting sites will increase as the wetland replacement community matures and vegetation composition stabilizes. Natural filtration and pollution prevention functions will be partially exhibited in varying degrees and will increase in their representation and function as the wetland replacement community matures as well. All wetland functions that occurred within the affected wetlands will be fully exhibited and functional within the mitigation site at the end of five (5) full growing seasons; to include additional functions such as aquatic habitat, spawning sites, natural filtration, and pollution prevention.

Wetland replacement sites are generally monitored for a minimum of five (5) years which will include a

**site visit twice a year for the first three (3) years and once a year for the remaining two (2) years, as outlined in the PA DEP Technical Guidance Document 363-0300-001. Inspections are done within the growing season, as depicted by a PA DEP map for identifying growing seasons for wetland hydrology. These inspections are usually done between April 15 and October 15 for this location. A report is generated from each inspection that will discuss wetland determination parameters, succession of the wetland replacement site, success to date, function and value development, and a discussion of problems and remedial measures if warranted. A copy of the report will be submitted to the owner, COE and PA DEP.**

**Design details can be found on attached site plan and the included Cross Sections. A site plan of the wetland mitigation map and surrounding land uses, grading plan, planting plan, and planting specifications are included. The cross sections indicate existing wetland elevation data, mitigation site elevation data, water elevation data, underlying material information and slope data.**

*Show the location of replacement wetland sites on the Operations Map (Exhibit 9) and the Land Use and Reclamation Map (Exhibit 18).*

***Note:*** *At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres). The Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected. Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.*

# Module 14: Streams/Wetlands
## South of West Liberty Road
### Wetland No. 4 (Temporary Impacts)

**14.3 *Wetland Related Information***

a) *Provide the name(s), address(es), telephone number(s) and qualifications of the person(s) who made the determination if wetlands exist within the proposed permit area.*

**Derwood B. Davis (Biologist), The EADS Group, Inc., 15392 Rt 322, Clarion, PA 16214**

b) *Show the location of wetlands on Exhibits 6.2, 9 and 18.*

**Wetlands have been identified on the exhibit maps**

c) What is the total wetland acreage (which will be affected) for the proposed permit area? **0.01** acres.

d) *Provide responses to the following for each wetland which will be affected by the proposed mining activities:*

*Exceptional Value Wetland Characteristics*

1) *Does the wetland serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code?* ☐ yes ☒ no

2) *Is the wetland hydrologically connected to or located within 1/2 mile of the wetlands identified in d)1) and does it maintain the habitat of the "threatened" or "endangered" species within the wetlands identified in d)1) above)?* ☐ yes ☒ no

***NOTE:*** *If this wetland is located more than 1000 feet from the permit area, show its location (and the location of the wetland that is hydrologically connected to or located within ½ mile of) on the Exhibit 6.1 Map.*

3) *Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream?* ☐ yes ☒ no

4) *Is the wetland located in or along the floodplain of a stream listed as exceptional value (under 25 Pa Code Chapter 93) or the floodplain of a tributary to an exceptional value stream?* ☐ yes ☒ no

5) *Is the wetland within the corridor of a waterway which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act?* ☐ yes ☒ no

6) *Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply?* ☐ yes ☒ no

7) *Is the wetland located in areas designated by the Department as "natural" or "wild" areas within state forest or park lands?* ☐ yes ☒ no

8) *Is the wetland located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975?* ☐ yes ☒ no

9) *Is the wetland located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935?* ☐ yes ☒ no

***NOTE:*** *If a "yes" response is indicated for any question in d)1) through d)9), the wetlands would be "exceptional value" (as defined in 25 Pa Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25*

*Pa Code Section 105.18(a) have been met.*

*Wetland Functions*

10) *Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, or resting sites for aquatic or land species?* **These wetland communities would provide some food chain production and general habitat for terrestrial and semi-aquatic species only.** ☒ yes ☐ no

11) *Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?* **These wetlands are on private property and are not designated for study or resource protection.** ☐ yes ☒ no

12) *Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns or other environmental characteristics?* **These wetlands do provide some natural drainage of surface and ground waters to a tributary that establishes local surface water flow patterns.** ☒ yes ☐ no

13) *Does the wetland serve as storage areas for flood and storm waters, or does it shield other areas from erosion or storm damage?* **These wetlands contain a moderate grade to the northwest and a defined outlet that discharges water to tributaries. They are not part of a major waterway that floods.** ☐ yes ☒ no

14) *Does the wetland provide a groundwater recharge area that maintains minimum baseflows?* **These wetlands are supported by spring outcrops from a perched water table; providing recharge to an unnamed tributary.** ☐ yes ☒ no

15) *Does the wetland serve as a prime natural recharge area where surface water and groundwater are directly connected?* **These wetlands contain a defined outlet and are supported by spring outcrops.** ☐ yes ☒ no

16) *Does the wetland aid in the prevention of pollution?* **These wetlands have the potential however, significant pollutant sources are lacking within the upstream area.** ☒ yes ☐ no

17) *Is the wetland used for, or does it provide the opportunity to be used for recreation?* **These wetlands are located on private property and are not open to the general public.** ☐ yes ☒ no

e) *If a "yes" response is indicated for the question in d)1) or d)2), identify how the determination was made and indicate any contacts with state or federal agency personnel.*

### 14.4 Wetland Impact Analysis/Assessment

a) *Describe the alternatives to the proposed mining activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (e.g. relocating spoil/topsoil storage areas, rerouting haul roads).*

**These impacts are a result of temporary impacts from the construction of a 4 inch Schedule 40 PVC sanitary pipeline. Alternatives considered were No Build, Alignment Avoiding Wetland No. 4 and Alignment With Minimal Impact To Wetland No. 4.**

b) *Discuss whether any of the alternatives are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites which would not affect the wetlands.*

**The No Build Alternative is a feasible alternative but was considered not prudent. Due to the length of time that the plant will be operating and the number of full time employee's onsite, a sanitary onsite septic system was warranted; not to mention required by the PA DEP.**

**The sewer line alignment avoiding impacts to Wetland No. 4 was not a feasible alternative due to weighing design standards, slope requirements and site development barriers. The stream crossing site was selected based on the shallower water depth, drainage area, required slope standards for sanitary pipelines and the ability to achieve a minimum of 3 feet of cover over the stream crossing. Design parameters for gravity flow sanitary pipelines require a minimum of a 1 percent slope and the sanitary pipeline between the septic and dosing tanks must be at a minimum of a 2 percent slope. The need to maintain a minimum 2 percent slope between the septic and dosing tanks required both tanks to be located on the west side of the stream; since the natural grade on the east side of the stream was too flat. Other stream crossing locations that would not impact Wetland No. 4 would not maintain the required slopes for gravity flow sanitary lines.**

**The sewer line alignment with minimal impact alternative was considered feasible and prudent based on meeting the required minimum of 3 feet of covering at the wetland and stream crossing, required slopes for sanitary line construction, the depth of water in the stream and the location of the sediment pond. The first alternative was located approximately 25 linear feet to the north of the current proposed crossing. Upon additional wetlands investigation this alternative resulted in 0.03 acres of temporary wetland impact as well as a stream crossing. The location was shifted south reducing temporary wetland impacts by crossing at a more narrow point within the wetland community resulting in 0.01 acres of temporary impact. This alternative achieves the goals and objectives of Glacial Sand & Gravel and the PA DEP with minimal environmental impacts to this wetland community that are temporary and can be mitigated through restoration methods.**

c) *If any wetlands within the proposed permit area will be directly affected, provide the following:*

1) *Identify and delineate the wetland and the areal extent of the impact (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and delineation of wetlands – statement of policy).*

**The affected wetlands are shown on the attached site plan. The aerial extent of temporary wetland impacts by the construction of this sanitary line is 0.01 acres.**

2) *Submit a cross-sectional view showing the wetland and the proposed mining area.*

**Cross sections of this wetland community and the sanitary line crossing are attached.**

3) *Explain how the proposed mining activities will directly affect the wetlands.*

**The construction of this sanitary line will directly affect this wetland community by excavation, backfilling and grading as part of standard pipeline construction methods.**

aa) *If the proposed mining activities will affect less than 1.0 acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 Pa Code Section 105.17), provide a description of the wetland functions which will be impacted by the proposed mining activities.* ***Note:*** *If a "yes" response is indicated for any question in Module 14.3 d)1) through d)9), the wetlands would be exceptional value (as defined in Section 105.17).*

bb) *If the proposed mining activities will affect 1.0 or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions identified in Module 14.3 d)10) through d)17).*

**Plant accumulation and decomposition occurring within this wetland community would be broken down into organic and inorganic nutrients. The affected wetland would provide carbon and other inorganic nutrients to the unnamed tributary immediately adjacent to as well as downstream reaches. The affected wetland provides general habitat for terrestrial and semi-aquatic organisms. This community would provide food and cover for these organisms during most of the year. Aquatic habitat is not provided due to the lack of open water habitat for a sufficient time during the growing season. Pollution prevention would be moderately exhibited by the affected wetland however, the well defined outlet, lack of significant open water, low vegetation/water interfacing, and lack of potential pollution sources upslope of the wetland reduces the opportunity for this wetland community to fully exhibit this function.**

d) *If any wetlands within the proposed permit or adjacent area will be indirectly affected (e.g. altering the wetland*

*hydrology), provide the following:*

**No other wetland communities will be indirectly affected by the proposed sanitary line construction.**

1) *Identify and delineate the wetland and provide an estimate of the total wetland acreage affected (wetlands must be identified and delineated in accordance with 25 Pa Code Section 105.451 Identification and Delineation of Wetlands – statement of policy).*

2) *A description of how the proposed mining activities will indirectly affect the wetlands.*

e) *Will the cumulative impact of the proposed and anticipated mining activities result in a major impairment of the wetland resource in the general area?* ☐ yes ☒ no

*Provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.*

**The affected wetland community is a small to medium sized, perched, wetland community providing functions at various levels. Impacts to these wetlands are site specific and temporary and, will not result in cumulative impacts to wetland resources in the surrounding area.**

### *14.5 Wetland Mitigation/Replacement*

***Note:*** *If a total of one-half (.5) acres or less of wetlands will be affected, participation in Pennsylvania's Wetlands Replacement Project may be authorized by the Department in lieu of onsite replacement of the wetlands.*

a) *If wetland mitigation measures or wetland replacement are proposed, address the following:*

1) *Identify the wetlands where mitigation measures will be employed.*

**Wetland restoration measures will be completed in-kind as part of the trench backfill procedures.**

2) *Identify the wetlands that will be replaced and the location of the replacement wetland site. Provide the number of acres for each wetland to be replaced and the acreage of the replacement wetland.*

**The wetland community to be restored is classified as a Palustrine, Scrub Shrub, Broad-leaved Deciduous community that is located within the upper reach of an unnamed tributary to Black Run. This wetland community will be restored onsite within the watershed of the unnamed tributary to and Black Run. The affected wetland acreage and the restored acreage is calculated to be 0.01 acres.**

3) *Provide a plan for mitigation/replacement following the guidelines in the Department's technical guidance titled "Design Criteria - Wetlands Replacement Monitoring" document 363-0300-001. This guidance is available from the Division of Waterways, Wetlands and Erosion Control, Post Office Box 8854, Harrisburg, Pennsylvania 17105-8554 or through the Department's Web Site.*

**The wetland restoration plan proposes to restore the affected wetlands at a 1:1 ratio.**

**The wetland functions and values identified to be present within the affected wetland will be restored equally as a result of the proposed restoration plan based on being able to restore the affected area within the actual affected area and Black Run watershed.**

**The restoration plan will initially consist of a Palustrine, Persistent, Emergent wetland community, succeeding into a Scrub Shrub, Broadleaved Deciduous wetland community supported by a soil saturated and seasonally flooded hydrological regime.**

**Inundated and soil saturated conditions are expected to occur throughout the growing season above the surface to one (1) foot below the surface based on the existing data gathered during the delineation of the wetland community.**

**Soil conservation measures will be used to restore the hydric soils within the affected wetlands. The top 12 inches of soil within the affected wetlands will be excavated and stockpiled as necessary until the bedding and placement of the pipe is completed. This stockpile will be covered with a tarp(s) to reduce evaporation and maintain moisture within the soil. Upon completion of the bedding and placement of the pipe the trench will backfilled up to within a foot below the surface. The hydric soil will be placed within this portion of the trench and brought to the existing grade. At a minimum this soil will act as a planting medium for the specified seed mix; however this soil will contain a seed bank of indigenous hydrophytic plant species that, if properly stored and placed, will likely germinate and proliferate within the existing wetland community.**

**Once the trench has been graded to the existing contour it will be seeded with Wildlife Food and Shelter Shrub Mix (ERNMX-138) at a rate of 15 lbs per acre. The ERNMX-138 is composed of Fox sedge, *Carex vulpinoidea* (24%); Arrow wood, *Viburnum dentatum* (14%); Virginia wild rye, *Elymus virginicus* (11%); Lurid sedge, *Carex lurida* (10%); Silky dogwood, *Cornus amomum* (10%); Grey dogwood, *Cornus racemosa* (10%); Hop sedge, *Carex lupulina* (5%); Blunt broom sedge, *Carex scoparia* (7%); Hercules' club, *Aralia spinosa* (3%); Awl sedge, *Carex stipata* (2%); Cosmos bristly sedge, *Carex comosa* (1%); Buttonbush, *Cephalanthus occidentalis* (2%); and Meadow sweet, *Spiraea alba* (1%). As an E & S control crop the restored site will be seeded with Annual ryegrass, *Lolium multiflorum* at a rate of 15 lbs per acre.**

**Plants and seed can be obtained from Ernst Conservation Seeds, 9006 Mercer Pike, Meadville, PA, 16335, 800-873-3321 or www.ernstseed.com. Seed will be mechanically broadcasted on the restored site and the anticipated survival rate and percent aerial cover is expected to be between 90 and 100 percent after one (1) full growing season. The percent aerial cover at three (3) years of maturity is expected to be 100 percent and consisting of hydrophytic plant species.**

**Restoration of the wetland community shall begin immediately upon completion of the bedding and placement of the pipe. It is anticipated that upon beginning site reclamation activities, restoration measures will be completed the same day. Within one (1) year after the affected wetland community is restored it is expected to function in full capacity for drainage and flow patterns, stormwater retention, sediment stabilization and surface water discharge. Biological functions such as food chain production, aquatic and terrestrial habitat, nesting, spawning, and resting sites will increase as the restored area matures and vegetation composition stabilizes. Natural filtration and pollution prevention functions will be partially exhibited in varying degrees and will increase in their representation and function as the restored area matures as well. All wetland functions that occurred within the affected wetlands will be fully exhibited and functional within the restored area at the end of three (3) full growing seasons.**

*Show the location of replacement wetland sites on the Operations Map (Exhibit 9) and the Land Use and Reclamation Map (Exhibit 18).*

***Note:*** *At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres). The Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected. Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.*

Commonwealth of Pennsylvania
**Pennsylvania Historical and Museum Commission**
**Bureau for Historic Preservation**
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
*www.phmc.state.pa.us*

29 August 2008

Thomas R. Baker
P.O. Box 512
Latrobe, PA 15650

Re: ER# 2007-1788-019-D
MINE: Glacial Sand and Gravel Co., SMP No. 10070304, Mine 47 Operation, Worth Twp., Butler Co.

Dear Mr. Baker:

The Bureau for Historic Preservation has reviewed the above named project under the authority of the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988). This review includes comments on the project's potential effect on both historic and archaeological resources.

This report meets our standards and specifications as outlined in *Cultural Resource Management in Pennsylvania: Guidelines for Archaeological Investigations* (BHP 1991) and the Secretary of the Interior's Guidelines for Archaeological Documentation. We agree with the recommendations of this report and in our opinion no further archaeological work is necessary for this project.

Please send four copies of the final report (one unbound and all with original photographs) for our files and distribution to the various repositories. If you need further information in this matter please consult Kira Presler at (717) 705-0700.

Sincerely,

(for)

Douglas C. McLearen, Chief
Division of Archaeology & Protection

cc: Mark McConaughy
Department of Environmental Protection, Knox District Office, ATTN: Chris Yeakle, White Memorial Building, Knox, PA 16232
Glacial Sand & Gravel Company, P.O. Box 1022, Kittanning, PA 16201

DCM/kmp

# GLACIAL SAND AND GRAVEL COMPANY- PROPOSED MINE NO. 47 PROJECT

## SURVEY RESULTS FOR EASTERN MASSASAUGA RATTLESNAKE (*SISTRURUS CATENATUS CATENATUS*) AT PROPOSED MINE NO. 47, BUTLER COUNTY, PENNSYLVANIA

**MAY – JUNE 2008**

**Prepared by**
**Tetra Tech, Inc.**
**Portland, Maine**


**For**
**Glacial Sand and Gravel Company**
**Kittanning, Pennsylvania**

**July 2008**

Glacial Sand and Gravel Company – Proposed Mine No. 47 Project

# Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus Catenatus Catenatus*) at Proposed Mine No. 47, Butler County, PA

May – June 2008

Final Report

Prepared by

Tetra Tech, Inc.
Portland, ME

For

Glacial Sand and Gravel Company
Kittanning, PA

July 2008

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# 1.0 INTRODUCTION

A habitat assessment and survey was conducted by Tetra Tech, Inc. (TT) to investigate and evaluate the proposed location of Glacial Sand and Gravel Company's Mine 47 as potentially suitable eastern massasauga rattlesnake (massasauga) habitat. The proposed Mine No. 47 is located at the intersection of Swope Road and West Liberty Road in town of Slippery Rock, Butler County, Pennsylvania. The primary purposes of this habitat assessment and subsequent survey periods were to: 1) evaluate this area to determine whether the vegetative structure, vegetative species composition, and other habitat parameters represent suitable habitat for the massasauga, and 2) if the habitat is deemed suitable for the massasauga, define and survey specific areas within the proposed Mine 47 site via visual encounter survey to determine whether this species is present.

The massasauga is listed by the Pennsylvania Fish and Boat Commission (PFBC) as endangered in the State of Pennsylvania. The massasauga is historically documented to occur in the vicinity of the proposed Mine 47 site; however, there is no historic documentation or information confirming the presence of the massasauga on site.

At the landscape level, massasauga are known to be found in habitats ranging from wet prairies, fens and sedge meadows to old open fields and adjacent forests. In many instances, massasauga show seasonal shifts in habitat use. Typically they can be found in wet prairie and meadow habitats in spring and fall, and in drier upland field or open wooded habitats in summer (Johnson et al. 2000).

More specifically, massasauga habitat consists of a complex of structural and vegetation features that provide opportunities for three key requisites: foraging, basking and overwintering. As their principal prey is rodents which they locate by olfactory means and then adopt a sit-and-wait strategy, adult massasaugas may be found wherever rodents occur. Basking opportunity is important for the thermoregulatory demands of digestion and ecdysis (shedding) for all individuals and is particularly critical for gestation by gravid females. Basking sites consist of areas exposed to the sun that also provide cover from predators. Overwintering sites are important components of massasauga habitat. These sites consist of situations where individual snakes can avoid lethal freezing temperatures and typically contain liquid water. Crayfish burrows, root mats of wetland trees and shrubs and vegetated hummocks in peatlands are examples. In eastern Pennsylvania and across most of the Midwestern United States, crayfish burrows are the principal overwintering site.

## 1.1 STUDY AREA

The study area consisting of open forb dominated fields in the vicinity of secondary growth forest, and wetland dominated forested and non-forested bottomlands containing hydrophytic soils and vegetation. To more efficiently survey the proposed mine area; two possible massasauga habitat (PMH) survey areas were developed (Appendix A). Of the two areas surveyed, PMH 1 is an estimated 2.0 acres; while, PMH 2 is an estimated 4.5 acres in size.

The study area includes all areas that meet the criteria needed to provide foraging, basking, or overwintering habitat. PMH 1 consists of maintained grass and shrub/willow habitat and is located south of an emergent wetland that is currently maintained by a resident beaver population. PMH 1 is characterized by having a number of chimney building crayfish holes which, in this part of Pennsylvania can be used by the massasauga as overwintering sites, and open grassland habitat to provide basking sites for spring emergence and the presence of gravid females. PMH 2 is located south of West Liberty Road and is dominated by cultivated grasses and palustrine emergent wetlands. The wetlands appear to be depressional drainage swales and low laying areas characterized by emergent sedges and rushes. Crayfish chimneys are also present.

# 2.0 METHODS

## 2.1 SURVEY PERIOD

Since massasauga activity is variable dependent on weather conditions it is best to perform visual searches under the following criteria: Weather conditions are best with at least 50% cloud cover, with a wind speed less than 15 mph, and temperatures between 50 and 80 degrees Fahrenheit. Surveys should be carried out in the morning and evening when massasauga are in open basking locations. The most productive survey periods tend to be during spring emergence and mid-summer when gravid females are seeking out open basking sites (Casper et al. 2001).

Visual encounter surveys were conducted Three times during the spring of 2008. The survey generally followed the guidelines set forth by the Pennsylvania Fish and Boat Commission (PFBC) in 1999, "Guidelines for Eastern Massasauga Rattlesnake Surveys" to determine presence or absence. These guidelines state that surveys for the eastern massasauga should be performed during the spring emergence period of May 1 to June 15. During this time of year the massasauga is known to remain close to the hibernaculum (overwintering site) while it forages and prepares for breeding. Surveys of PMH were carried out during this spring emergence period as noted in Table 1. Surveys generally occurred between 08:00 and 13:00 hours.

Table 1. Survey dates and times by location

| Survey Location | Date | Time |
|---|---|---|
| PMH 1 / PMH 2 | April 26, 2008 | 08:15 - 09:30 / 09:30 -10:30 |
| PMH 1 / PMH 2 | May 10, 2008 | 09:00 - 10:00 / 10:00 - 12:30 |
| PMH 1 / PMH 2 | May 24, 2008 | 08:50 -10:45 / 10:45 - 12:30 |
| PMH 1 / PMH 2 | June 9, 2008 | 08:00 - 09:30 / 09:30 - 11:30 |

## 2.2 SURVEY METHODS

All surveys were performed by PFBC-recognized surveyor Dr. Glenn Johnson and associate biologist Justin Sweitzer. The visual encounter survey method was used throughout the survey period. Actual survey dates occurred between May 10 and June 9, 2008. At the onset of each survey data such as time, air temperature, average wind speed, relative humidity, and current

weather conditions were collected to establish that the baseline criteria, as set forth by the PFBC, for conducting eastern massasauga surveys were met.

## 3.0 RESULTS

While the Proposed Mine No. 47 Site does contain habitat areas which are theoretically suitable for the massasauga, field surveys conducted by Tetra Tech, Inc. did not document the presence or other physical evidence of this species on the Site. Therefore, mining and related activities on the Mine No. 47 Site should not have an adverse impact on the massasauga.

Sincerely,
Tetra Tech, Inc.

Justin L. Sweitzer
Associate Biologist

Glenn Johnson, Ph.D.
Senior Biologist

## LITERATURE CITED

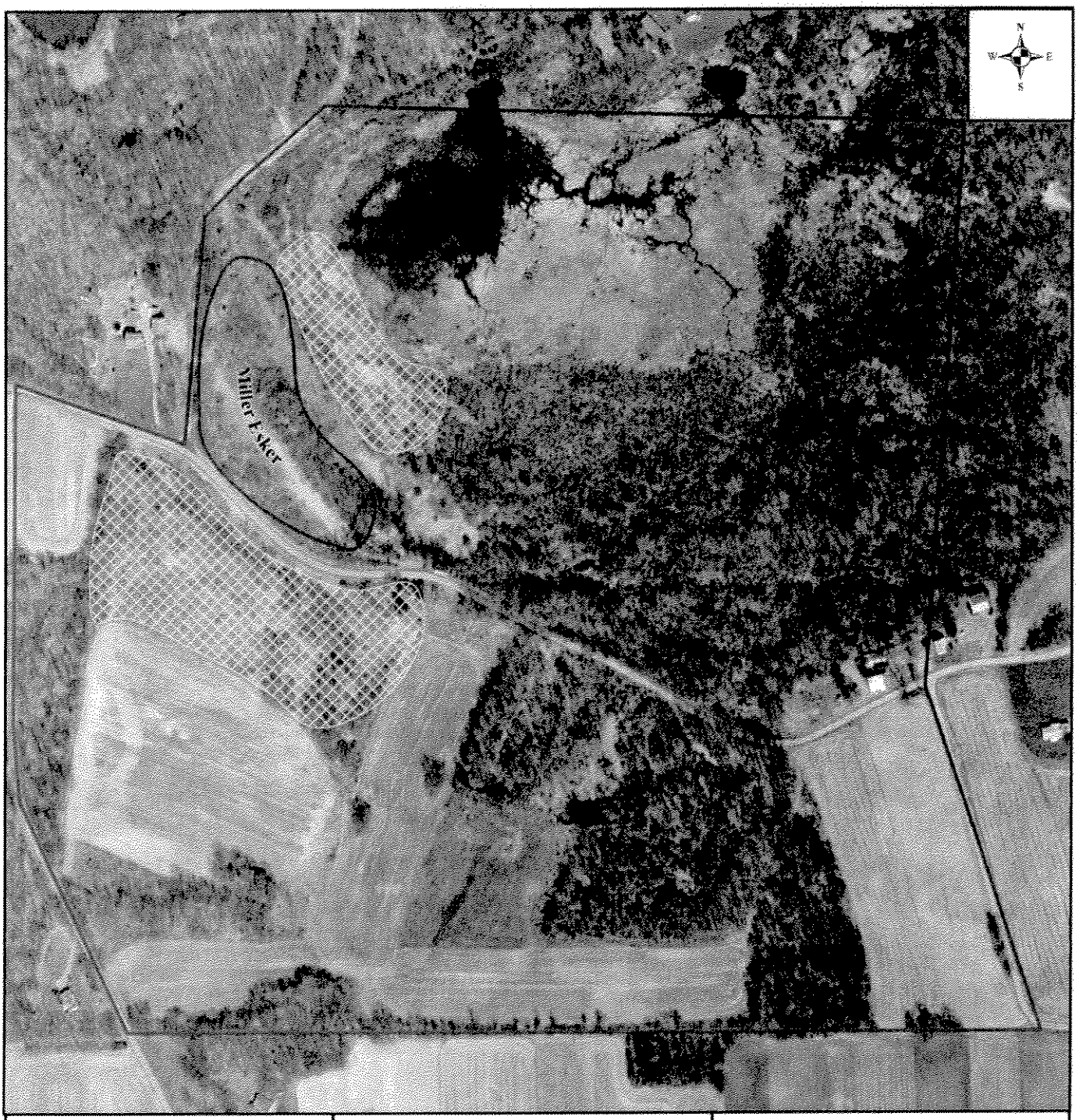
Casper, G.S., T.G. Anton, R.W. Hay, A.T. Holycross, R.S. King, B.A. Kingsbury, D. Mauger, C. Parent, C.A. Phillips, A. Resetar, and R.A. Seigel. In prep. Recommended standard survey protocol for the eastern massasauga, *Sistrurus catenatus catenatus*. Draft sub. to Herp Review, February 2000. 10 pp.

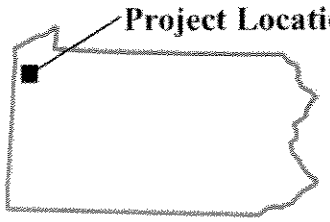
Johnson et al. 2000. The Eastern Massasauga Rattlesnake: A Handbook for Land Managers. U.S. Fish and Wildlife Service, Fort Snelling, MN 55111-4056 52 pp. + appdx.

Szymanski, J. 1998. Status assessment for the Eastern Massasauga (*Sistrurus c. catenatus*) 1998.U.S. Fish and Wildlife Service, Endangered Species Division, Fort Snelling, Minnesota. 30 pp. + appendices.

# APPENDIX A

## Site Map Showing Potential Massasauga Habitat




Source: 2006 Color Orthophotos of Pennsylvania, PAMAP Program, PA Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey

250 125 0 250 500

Feet

**LEGEND**

Project Boundary

Potential Massasauga Habitat

Esker

**Figure 1. 2008 Potential Eastern Massasauga Rattlesnake Habitat Survey Areas at Proposed Mine NO. 47.**

Client: Glacial Sand and Gravel Company

Prepared By: TETRA TECH, INC.

Date: 04/08

z:/projects/oe-200/maps/figurex.mxd

# APPENDIX B

## Photo Documentation of 2008 Survey Effort

**PROPOSED MINE NO. 47 – EASTERN MASSASAUGA SURVEY**
**PHOTO DOCUMENTATION**

**Company:** Glacial Sand and Gravel Company

**Project:** Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) at Proposed Mine No. 47

**Photo No.:** 1

**Date:** April 26, 2008

**Direction:** Northeast

**Comments:** View of wetland area and PMH 1 from Miller Esker. Vegetation in foreground is dominated by honeysuckle, arrow-wood viburnum, and autumn olive. Vegetation in the background, in the area of PMH 1 is dominated by forbs, grasses, and willow species.

**Photo No.:** 2

**Date:** April 26, 2008

**Direction:** West

**Comments:** View of PMH 1 from the eastern most side.

**PROPOSED MINE NO. 47 – EASTERN MASSASAUGA SURVEY**
**PHOTO DOCUMENTATION**

**Company:** Glacial Sand and Gravel Company

**Project:** Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) at Proposed Mine No. 47

**Photo No.:** 3

**Date:** April 26, 2008

**Direction:** N/A

**Comments:** Chimney building crayfish burrows found in low lying areas at PMH 1.

**Photo No.:** 4

**Date:** April 26, 2008

**Direction:** West

**Comments:** View of western portion of PMH 1.

**PROPOSED MINE NO. 47 – EASTERN MASSASAUGA SURVEY**
**PHOTO DOCUMENTATION**

**Company:** Glacial Sand and Gravel Company

**Project:** Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) at Proposed Mine No. 47

**Photo No.:** 5

**Date:** April 26, 2008

**Direction:** South

**Comments:** View of PMH 2 from intersection of Swope Road and West Liberty Road.

**Photo No.:** 6

**Date:** April 26, 2008

**Direction:** West

**Comments:** View of PMH 2 in area of depressional wetland. Small stream on western side of PHM 2 is within strip of trees. Field is dominated by soft rush and grass.

**PROPOSED MINE NO. 47 – EASTERN MASSASAUGA SURVEY**
**PHOTO DOCUMENTATION**

**Company:** Glacial Sand and Gravel Company

**Project:** Survey Results for Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) at Proposed Mine No. 47

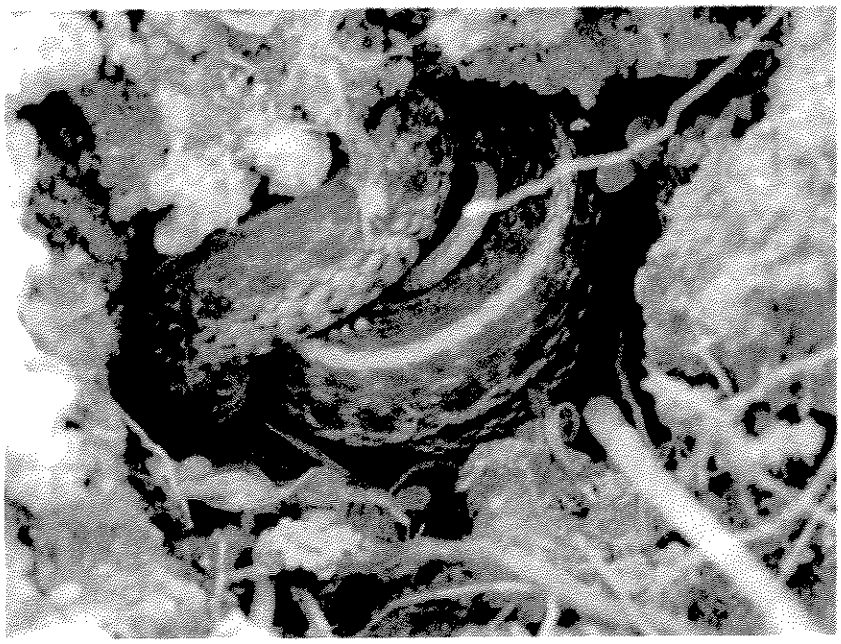


**Photo No.:** 7

**Date:** April 26, 2008

**Direction:** N/A

**Comments:** Eastern Garter snake (*Thamnophis sirtalis*) encountered at PMH 2 during initial habitat assessment.

**Photo No.:** 8

**Date:** April 26, 2008

**Direction:** Southeast

**Comments:** View of northeastern portion of PMH2 from intersection of Swope Road and West Liberty Road.

# APPENDIX C

## Field Notes

**Field Investigation April 26, 2008**

On April 26th, at 08:00 hours (military time), Justin L. Sweitzer, TT Associate Biologist, and Dr. Glenn Johnson, Professor of Biology at SUNY Potsdam (hereafter referred to as "the field crew"), arrived at the intersection of Stokes Road and West Liberty Road in Harrisville, PA. Upon arrival the field crew met with the client representatives, Darrel K. Lewis, Physical Engineer, and Jonathan Kolbe, Project/Operations Engineer. Following a brief overview of the site layout, the field crew and client representatives conducted a field survey of potential eastern massasauga habitat within the property boundaries as identified by Darrel K. Lewis, P.E.

At 08:15 hours, the field crew arrived at the first potential habitat survey area, depicted as PMH 1 in Figure 1 (Attachment A). This area is located on northeast side of the Miller Esker, north of West liberty Road and east of Stokes Road. PMH 1 consists of maintained grass and shrub/willow habitat. PMH 1 is located south of an emergent wetland that is currently maintained by a resident beaver population. Due to the beaver activity the water levels in the wetland fluctuate periodically and seasonally. PMH 1 has a number of chimney building crayfish holes which, in this part of Pennsylvania, can be used by the massasauga as overwintering sites; and open grassland habitat which could provide basking sites for spring emergence and the presence of gravid females.
At 09:30 hours, the field crew surveyed a second potential habitat area, PMH 2 in Figure 1 (Attachment A). This area is located south of West Liberty Road and is dominated by cultivated grasses and emergent wetlands. The wetlands appear to be depressional drainage swales and low laying areas characterized by emergent sedges and rushes. Crayfish chimneys scattered in the open field could provide suitable overwintering habitat for massasauga.
A garter snake was encountered at 09:45, gray tree frog and American toad heard at 09:00.

**Field Investigation May 10, 2008**

On May 10, 2008, at 09:00 hours, the field crew arrived at the site to begin the first survey period. Cloud cover was approximately 85% and it had rained the previous night; air temperature was 48.5°F; average wind speed of 0.7 m/sec; and a relative humidity (RH) of 90%. The field crew surveyed PMH1 from 09:00 to 10:00 with no reptile or amphibian encounters. Upon completion of PMH1 survey the field crew collected the following weather data and proceeded to PMH2. At 10:00 the air temperature was 55.8°F; average wind speed of 0.6 m/sec; RH 63%; with 70% cloud cover. No reptile or amphibian encounters were made during the survey of PMH2. The field crew discontinued the survey of Proposed Mine No. 47 at 12:30.

**Field Investigation May 24, 2008**

On May 24, 2008, at 08:50 hours, the field crew arrived at the site to begin the second survey period. There were no clouds; air temperature was 55.6°F; average wind speed of 0.0 m/sec; and a relative humidity (RH) of 73%. The field crew surveyed PMH1 from 09:00 to 10:45 with two garter snake encounters. Upon completion of PMH1 survey the field crew collected the following weather data and proceeded to PMH2. At 10:45 the air temperature was 63.2°F; average wind speed of 0.3 m/sec; RH 59%; with no cloud cover. No reptile or amphibian encounters were made during the survey of PMH2. The field crew discontinued the survey of Proposed Mine No. 47 at 12:30.

**Field Investigation June 09, 2008**

On June 9, 2008, at 08:00 hours, the field crew arrived at the site to begin the third survey period. There was 85% cloud cover; air temperature was 74.8°F; average wind speed of 0.6 m/sec' and a relative humidity (RH) of 89%. The field crew surveyed PMH1 from 08:00 to 10:00 with no reptile species encountered. The field crew heard a grey tree frog at 08:35. Upon completion of PMH1 survey the field crew continued on to survey PMH2. No reptile encounters were made during the survey of PMH2, however; the field crew heard multiple grey tree frogs. The field crew discontinued the survey of Proposed Mine No. 47 at 11:30.

# GLACIAL SAND AND GRAVEL COMPANY- PROPOSED MINE NO. 47 PROJECT

## SURVEY RESULTS FOR AMERICAN BITTERN (*BOTAURUS LENTIGINOSUS*)

## *AT PROPOSED MINE NO. 47, BUTLER COUNTY, PENNSYLVANIA*

**MAY 2008**

http://jerrysfoto.com/

**Prepared by**
**Tetra Tech, Inc.**
**Portland, Maine**

**For**
**Glacial Sand and Gravel Company**
**Kittanning, Pennsylvania**

**July 2008**

Glacial Sand and Gravel Company – Proposed Mine No. 47 Project

# Survey Results for American Bittern (*Botaurus lentiginosus*) at Proposed Mine No. 47, Butler County, PA
May 2008

Final Report

Prepared by

Tetra Tech, Inc.
Portland, ME

For

Glacial Sand and Gravel Company
Kittanning, PA

July 2008

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# 1.0 INTRODUCTION

A habitat assessment and survey was conducted by Tetra Tech, Inc. (TT) to investigate and evaluate the proposed location of Glacial Sand and Gravel Company's Mine 47 as potentially suitable American Bittern (*Botaurus lentiginosus*) habitat. The proposed Mine No. 47 is located at the intersection of Swope Road and West Liberty Road in the Town of Slippery Rock, Butler County, Pennsylvania. The purpose of this habitat assessment and subsequent survey was to: 1) evaluate the area to determine whether the vegetative structure, vegetative species composition, and other habitat parameters represent suitable habitat for the American Bittern, and 2) if the habitat is deemed suitable for the American Bittern, define and survey specific areas within the proposed Mine 47 site via call-response surveys and visual searches to determine whether this species is present.

## STUDY AREA

The total size of the study area, deemed potentially suitable for the American Bittern, is an estimated 15.0 acres, consisting of approximately 2.5 acres of open water marsh, surrounded by stands of mixed woody vegetation including several species of willow. The northeastern-most portion of this wetland, is approximately 2.0 acres, is dominated by cattail while the remainder of the emergent vegetation is dominated by sedges and rushes. Four survey locations were established to more efficiently survey the study area, which is adjacently located north of the proposed permit area for Mine No. 47. (Appendix A).

The study area is characterized by soft silty, sandy, gravelly substrate and impounded, slow moving still water. Based upon field observations, beaver activity in the area causes fluctuating water levels and changing vegetative composition on a year to year basis. Approximately 70 percent of the open water areas contain submergent and/or floating aquatic vegetation. Wetland cover types in the survey area include cattail-dominated, mixed native emergents, mixed invasive emergents, and willow (*Salix spp.)*-dominated shrub communities. These wetland cover types generally were distributed in low–lying areas adjacent to open water. Survey locations were generally surrounded by willow-dominated shrub or open areas dominated by mixed native and invasive emergents.

# 2.0 METHODS

## 2.1 BACKGROUND REVIEW

Tetra Tech conducted a review of existing data prior to performing field surveys. Data reviewed included information concerning the habitat requirements, species distribution, and element occurrences of American Bittern gathered from the Pennsylvania State Game Commission and other state and Federal agencies. Other information reviewed included recent literature and standard survey protocols for determining suitable habitat and presence/absence of American Bittern in areas of suitable habitat.

## 2.2 FIELD INVESTIGATION

### 2.2.1 Survey Locations

Following the review of existing data, Tetra Tech performed an on-site field investigation to evaluate existing habitat conditions and to determine the presence or absence of American bittern within the survey area. As part of the field investigations, four survey locations were established to provide complete coverage of all emergent vegetation (Appendix A). Locations were established along open water, willow-dominated shrub, and cattail dominated communities. Coordinates were determined for each location using Google Earth® and placed in the field by means of handheld GPS. Survey locations 1 through 4 were located at 41°00'26.33"N, 80°04'56.75"W; 41°00'24.48"N, 80°04'51.25"W; 41°00'24.71"N, 80°04'44.86"W; 41°00'29.45"N, 80°04'55.12"W respectively.

### 2.2.2 Survey Period

The study area was surveyed four times during the spring of 2008. The survey followed the guidelines set forth by the Pennsylvania Game Commission (PGC) in 2008, "Least Bittern and American Bittern Survey Protocol". This protocol states that surveys for the American bittern should be performed during the spring nesting period of April 25 to June 15. Surveys for the American Bittern were carried out during this nesting period as noted in Table 1.

Table 1. Survey dates and times by location

| Survey Location | Date | Time |
|---|---|---|
| #1 | April 30, 2008 | 06:40 – 07:00 |
| #2 | April 30, 2008 | 07:05 – 07:15 |
| #3 | April 30, 2008 | 07:25 – 07:40 |
| #4 | April 30, 2008 | 07:45 – 08:10 |
| #1 | May 3, 2008 | 06:30 – 06:45 |
| #2 | May 3, 2008 | 06:50 – 07:05 |
| #3 | May 3, 2008 | 07:10 – 07:25 |
| #4 | May 3, 2008 | 07:30 – 07:45 |
| #1 | May 9, 2008 | 06:35 – 06:50 |
| #2 | May 9, 2008 | 07:00 – 07:15 |

| | | |
|---|---|---|
| #3 | May 9, 2008 | 07:20 – 07:35 |
| #4 | May 9, 2008 | 07:40 – 07:55 |
| #1 | May 23, 2008 | 07:00 – 07:15 |
| #2 | May 23, 2008 | 07:20 – 07:35 |
| #3 | May 23, 2008 | 07:45 – 08:00 |
| #4 | May 23, 2008 | 08:05 – 08:20 |

### 2.2.3 Survey Methods

All surveys performed by qualified professional biologists: Principal Biologist David Santillo, Ph.D. and Associate Biologist Justin Sweitzer. The call-response method, sometimes referred to as the tape playback method, was the primary survey method used for determining presence or absence of the American Bittern at the Proposed Mine No. 47 location. The call-response method was supplemented with visual observations before, during, and after tape playback. Visual observations were also conducted while changing survey locations.

The playback was structured as follows: passive listening prior to initiation of playback, three sessions of 30 seconds of calls, and listening for 5 minutes between sessions. Calls of the American Bittern included the primary advertising call. Calls were taken from the Lang Elliot Eastern Field Guide to Bird Sounds CD's.

The observer completed the broadcasts from a standing location at each of the four survey locations. Broadcasts were at 180 degrees from an Apple Ipod and portable speaker station. Surveys were conducted in the absence of rain and high winds. Surveys were conducted in the early morning (Table 1).

# 3.0 RESULTS

## 3.1 BACKGROUND REVIEW

American Bittern is currently listed as a Species of Management Concern by the U.S. Fish and Wildlife Service (USFWS 1995) and is listed as an endangered species by the Pennsylvania State Game Commission (PGC 2003). This listing results, in part, as a result of habitat losses and degradation within the State of Pennsylvania.

American Bittern preferred habitat includes emergent marsh characterized by cat-tail (*Typha spp.*) and bulrush (*Scurpus spp.*) (Andrle and Carroll 1988). The American Bittern is also known to nest in sedge meadows, beaver ponds, kettle-hole bogs, alder thickets, and shrub swamps. Materials used for construction of the nest depend on the local vegetation. Commonly used materials include cat-tail, cordgrass, bulrush, or sedge (Andrle and Carroll 1988).

### 3.2 FIELD INVESTIGATION

The field investigation revealed that suitable nesting habitat for American Bittern is present north of the proposed Mine No. 47 permit boundary, and is generally concentrated in the northwestern portion of the survey area, between West Liberty Road and Swope Road.

However, based upon the field survey, which was conducted following the survey guidelines set forth by the Pennsylvania Game Commission (PGC) in 2008, "Least Bittern and American Bittern Survey Protocol", it was determined that the American Bittern is not using this wetland for nesting. In addition, the mine plan proposes no disturbance to the wetland. Therefore, American Bittern would not be affected by the proposed mine project and the wetland area would remain as suitable habitat for potential future American Bittern use.

Sincerely,
Tetra Tech, Inc.

Justin L. Sweitzer
Associate Biologist

Dave Santillo, Ph.D.
Principal Biologist

## LITERATURE CITED

Andrle, R.F., and J. R. Carroll. 1988. The Atlas of Breeding Birds in New York State. Cornell University Press.

Pennsylvania Game Commission-State Wildlife Management Agency. 2003. Endangered Species Program: List of Endangered and Threatened Bird and Mammal Species of Pennsylvania State. Available at: http://www.pgc.state.pa.us/pgc/cwp/view.asp?a=458&q=150321

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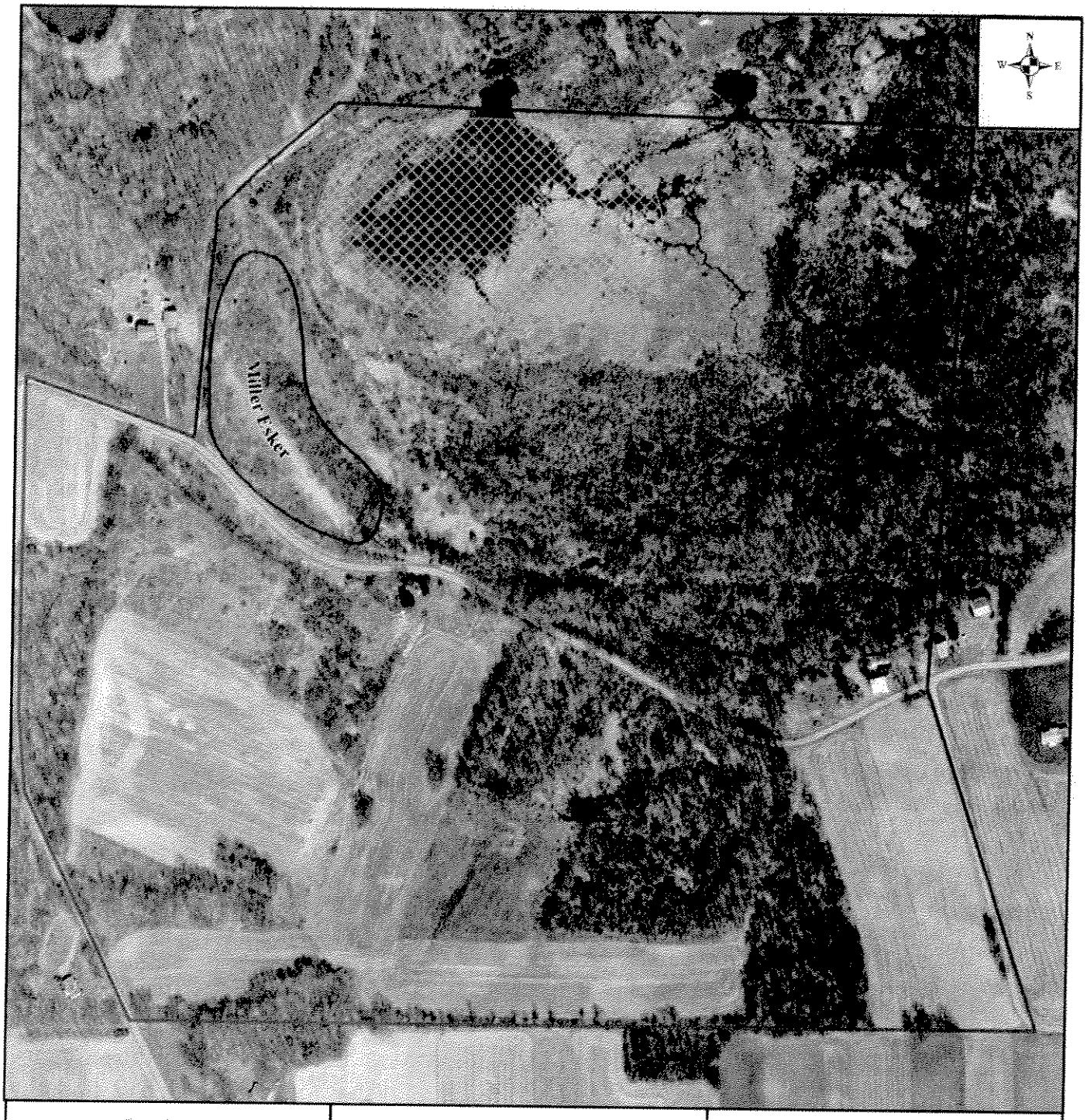
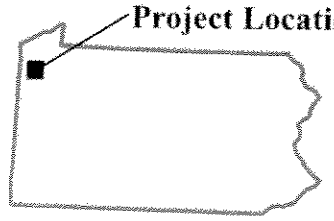
# APPENDIX A

## Site Map Showing Possible Bittern Habitat and Survey Locations




Source: 2006 Color Orthophotos of Pennsylvania, PAMAP Program, PA Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey

250 125 0 250 500

Feet

**LEGEND**

Project Boundary

Potential American Bittern Habitat

Esker

**Figure 1. 2008 Potential American Bittern Habitat Survey Areas at Proposed Mine NO. 47.**

Client: Glacial Sand and Gravel Company

Prepared By: TETRA TECH, INC.

Date: 04/08

z:/projects/oe-200/maps/figure1.mxd

# APPENDIX B

## Photo Documentation of 2008 Survey Effort

# APPENDIX C

## Field Notes

**Field Investigation April 30, 2008**

Temp: 45 F
Wind: 0 to 5 mph
Sky: 50 – 75 % cloudy
Tape playback initiated at Station 1 at 0640. Playback and listening sessions were alternated.
Playbacks initiated at: Station 2 at 0705; Station 3 at 0725; and Station 4 at 0745.
No American Bitterns were observed or heard.
Species recorded:
Green heron
Mallard
Canada geese
Song sparrow
Swamp sparrow
Yellow warbler
Common yellowthroat
Brown thrasher
Rufous-sided towhee
Red-winged blackbird
Brown cowbird

**Field Investigation May 3, 2008**

Temp: 55 F
Wind: 5 mph
Sky: 100 % cloudy
Tape playback initiated at Station 1 at 0630. Playback and listening sessions were alternated.
Playbacks initiated at: Station 2 at 0650; Station 3 at 0710; and Station 4 at 0730.
No American Bitterns were observed or heard.
Species recorded:
Mallard
Woodduck
Canada geese
Song sparrow
Swamp sparrow
Yellow warbler
Common yellowthroat
Rufous-sided towhee
American Crow
Red-winged blackbird
American goldfinch

**Field Investigation May 9, 2008**
Temp: 50 F
Wind: 0 to 5 mph
Sky: 25 % cloudy
Tape playback initiated at Station 1 at 0635. Playback and listening sessions were alternated.
Playbacks initiated at: Station 2 at 0700; Station 3 at 0720; and Station 4 at 0740.
No American Bitterns were observed or heard.
Species recorded:
Mallard
Canada geese
Song sparrow
Swamp sparrow
Yellow warbler
Common yellowthroat
American redstart
Red-winged blackbird

**Field Investigation May 23, 2008**

On May 23rd, at 06:45 hours (military time), Justin L. Sweitzer, TT Associate Biologist, arrived at the intersection of Stokes Road and West Liberty Road in Slippery Rock, PA. Weather conditions were sunny with some upper atmosphere clouds, temperature of 58°F, with a slight wind out of the southwest. Upon arrive at Location #1 the associate biologist encountered Four Green Herons (*Butorides virescens),* One White-tailed Deer (*Odocoileus virginianus*), Two Mallard Ducks (*Anas platyrhynchos,* One Red-winged Blackbird (*Agelaius phoeniceus*), and One American Crow (*Corvus brachyrhynchos).* Tape playback was initiated at 07:00 and played 2 times for 30 seconds each. Listening and visual searches followed until 07:15. During transition to Location #2 One Northern Cardinal (*Cardinalis cardinalis)*, One Turkey Vulture (*Cathartes aura)*, and One unknown Woodpecker species were encountered or heard. Once at Location #2 the tape playback was used from 07:20 to 07:35 in the same manner as at Location #1. The same was done at Location #3 from 07:45 to 08:00 and Location #4 from 08:05 to 08:20 with no new sightings. No American Bittern response or sights were noted.

TETRA TECH

August 19, 2008

Mr. Darrel Lewis
Glacial Sand and Gravel Company
One Glade Park East
Kittanning, Pennsylvania 16201

**RE: Letter Report – Investigation of Potential Bald Eagle Habitat at Proposed Mine No. 47, Butler County, Pennsylvania**

Dear Mr. Lewis:

Tetra Tech, Inc (TT) is pleased to submit to Glacial Sand and Gravel Company this letter report summarizing the purpose, background, and conclusion of an investigation of potential bald eagle (*Haliaeetus leucocephalus*) habitat conducted for the proposed Mine No. 47 site, in Butler County, Pennsylvania, on August 19, 2008.

PURPOSE

Per your request, TT has completed a literature review to assess the potential of the proposed mine site to provide bald eagle habitat. This literature review, combined with our familiarity with the project area and understanding of the project scope of work, was used to determine if potential habitat for bald eagle is present within the proposed Mine No. 47 site's permitted boundary.

BACKGROUND/LITERATURE REVIEW

The bald eagle is listed by the State of Pennsylvania and the Federal Government as a threatened species. The drastic decline and near extirpation of the bald eagle from Pennsylvania can be attributed to many factors. Loss of habitat, reduction in water quality, hunting, and use of DDT are the main factors contributing to their decline. At one point in the 1980's there were thought to be as few as 3 nesting pairs of bald eagles in the entire state of Pennsylvania. Since that time steps have been taken to ensure the return and survival of the bald eagle.

Bald eagles prefer habitat in which there are bodies of water that provide adequate food and limited human disturbance. Nesting eagles are particularly sensitive to human impacts and are most often located in low impact forested areas within close proximity to open water for hunting and scavenging (PGC 2006).

At present bald eagle numbers have climbed to around 100 nesting pairs throughout the state (PGC 2006). Two sites within Butler County are known nest sites for the bald eagle. The first site is Moraine State Park and Lake Arthur, which is located approximately 3 miles south of the proposed Mine No. 47 location. The second site is located approximately 10.5 miles northeast of

Tetra Tech, Inc.
Tel Fax

AUG 22 2008

TETRA TECH

proposed Mine No. 47 at State Game Lands 95 and Glade Dam Lake, also known as "The Glades", in north central Butler County, Pennsylvania.

The proposed Mine No. 47 permit boundary is located within Glacial Sand and Gravel's property at the intersection of West Liberty Road and Swope Road in the Town of Slippery Rock, Butler County, Pennsylvania. The proposed Mine No. 47 site is characterized as open fallow fields, rolling terrain dominated by scrub shrub species, and early to mid successional forest. A large emergent wetland and associated forested wetland are located north of the permit boundary within the Glacial Sand and Gravel property.

CONCLUSION

Based on our literature review and knowledge of the proposed Mine No. 47 location, we believe that the property within the proposed Mine No. 47 permit boundary, although in close proximity to known nesting sites, would not likely support the bald eagle. This conclusion is based on two reasons: (1) the majority of the site is characterized by fallow fields and rolling terrain dominated by scrub/shrub that provides little to no habitat; and, (2) the majority of the emergent and forested wetland portion within Glacial Sand and Gravel's property is located outside of the proposed Mine No. 47 permit boundary and will not be directly impacted during mining activities.

Please feel free to contact me at (207) 879-9496, ext. 240, if you have questions regarding this submittal. We look forward to providing you with continued support on this important project.

Sincerely,
Tetra Tech, Inc.

Justin L. Sweitzer
Associate Biologist

David J. Santillo

Dave Santillo, Ph.D.
Principal Biologist

TETRA TECH

REFERENCES

Pennsylvania Game Commission-State Wildlife Management Agency. 2006. Endangered Species Program: List of Endangered and Threatened Bird and Mammal Species of Pennsylvania State. Available at: http://www.pgc.state.pa.us/pgc/cwp/view.asp?a=486&q=152498

**FRED J. BRENNER, PhD.**
*Consulting Ecologist and Biologist*
(724) 748-4310

LAND RECLAMATION
ECOLOGICAL SURVEY
WETLAND DELINEATION
FISH and WILDLIFE MANAGEMENT
WATER ANALYSIS

789 NORTH LIBERTY ROAD • GROVE CITY, PENNSYLVANIA 16127

Certified Senior Ecologist
Professional Wetland Scientist
Certified Wildlife Biologist

December 23, 2008

Emilee C. Boyer
Environmental Review Specialist
FOR Chris Firestone
Plant Program Specialist
DCNR/BOF/PNDI
P.O. Box 8552

RE: Response to request in review letter dated December 12, 2008 Received December 20, 2008.

*Cladium mariscoides* was observed on 30 September 2008 in the wetland below the spring on the Carl S. Jr. and Norma L. Rodgers (Lat. 41-00-17.60 Long. 80-04-37.83). This property is north of the road outside the boundaries of proposed Mine 47 Permit and will not be impacted by the proposed and and gravel mining operation. The location of *Scirpus acutus* (syn. *Schoenoplectus acutus* (Lat. 41-00-28.13 Long. 80—4-47-33) is also north of the road outside the proposed permit boundaries.

The wetland referred to in the second paragraph is the large wetland system located north of the road outside of the permit boundaries. This is the same wetland complex referred to the first paragraph on page 2 of my report and the same wetland referred to previously in paragraph 1 of this response to your December 12, 2008 review letter.

The locations of wetland 1-4 are located on Exhibit 6.2 Environmental Resource Map previous received by your office. The reference to *Carex alata* was a mistake and this species does not occur in any of the four wetlands within the permit boundaries as indicated in my report dated July 10, 2008.

I am not sure of the exact date of when wetlands 3 and 4 were brush hogged but it was some time between the middle of July and the Middle of September, 2008.

Respectively,

Fred J. Brenner, Ph.D.
Certified Senior Ecologist
Certified Wildlife Biologist
Professional Wetland Scientist

**FRED J. BRENNER, PhD.**
*Consulting Ecologist and Biologist*
(724) 748-4310

LAND RECLAMATION
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WATER ANALYSIS

789 NORTH LIBERTY ROAD • GROVE CITY, PENNSYLVANIA 16127

Certified Senior Ecologist
Professional Wetland Scientist
Certified Wildlife Biologist

November 20, 2008: Revised December 23, 2008

Darrell Lewis
Glacial Sand and Gravel
P.O. Box 1022
Kittanning, PA 16201

RE: Distribution of plant species in the four wetlands located on proposed boundaries of Mine 47, Worth Township, Butler County, Pennsylvania

| | Species Distribution | | | |
|---|---|---|---|---|
| Species | Wetland 1 | Wetland 2 | Wetland 3 | Wetland 4 |
| *Acer rubrum* | | | | X |
| *Alnuus incana* | | | | X |
| *Bidens frondosa* | | X | X | |
| *Carex atlantica* | | | X | |
| *Carex cristella* | | | X | |
| *Carex lacustris* | | | X | |
| *Carex lurida* | | | X | |
| *Cornus amomum* | X | | | X |
| *Crataegus spp* | | | | X |
| *Echinochloa muricata* | | | X | |
| *Eupatoriadelphus fisulosus* | | | | X |
| *Eupatoriadelphus maculates* | | | | X |
| *Glycaria heneracea* | | | X | |
| *Glycaria striata* | | | X | |
| *Impatiens capensis* | | | | X |
| *Juncus effuses* | | X | X | |
| *Leersia oryzoides* | | X | X | |
| *Lemma minor* | X | | | |
| *Lobelia cardinalis* | | | X | |
| *Lobelia siphilitica* | | | X | |
| *Nupha luteum* | X | | | |
| *Onoclea sensibilis* | | X | X | |
| *Osmunda cinnamonea* | | X | X | |
| *Osmunda claytoniana* | X | X | | |
| *Osmunda regalis* | | X | | |
| *Phalaris arundinacea* | | X | X | |
| *Physocarpus opulifolius* | | | | X |

Species Distribution Cont.

| Species | Wetland 1 | Wetland 2 | Wetland 3 | Wetland 4 |
|---|---|---|---|---|
| | Species Distribution | | | |
| *Polygonum arifolium* | | X | X | |
| *Polygonum punctatum* | | X | X | |
| *Polygonum arifolium* | | X | X | |
| *Polygonum punctatum* | | X | X | |
| *Polygonum sagitalum* | | X | X | |
| *Populus tremuloides* | | | | X |
| *Quercus palustris* | X | | | X |
| *Rosa multifolia* | | | | X |
| *Rosa palustris* | X | | | |
| *Salix nigra* | X | | | X |
| *Sambucus Canadensis* | | | | X |
| *Scirpus acutus** | | | | |
| *Scirpus atrovirons* | X | | X | |
| *Scirpus validus* | X | | | |
| *Solidago Canadensis* | | X | X | |
| *Solidago patula* | | X | X | |
| *Sparganium americanum* | | X | | |
| *Sparganium eurycarpum* | | X | | |
| *Spiraea alba* | | X | X | X |
| *Spiraea tomentosa* | | X | X | |
| *Symplocarpus foetidus* | X | | | X |
| *Toxicodendron radicans* | X | | | X |
| *Toxicodentron vernix* | X | | | |
| *Verbena hastate* | | X | X | |
| *Vernonia oveboracensis* | | | | X |
| *Vibnonia lentago* | | | | X |
| *Verburnum recognitum* | X | | | X |
| *Ulmus americana* | X | | | X |

* located outside of permit boundaries north of road

*Cornus stolonifera* occurs outside of the permit area

*Scirpus hattorianus* also occurs in wetlands 1 and 2 but it is listed as non wetland Indictor species.

Wetland 3 has been brush-hogged for an archeological investigation and wetland 4 was bush-hogged along the road and power-line.

In the previous report dated 20 November 2008, *Carex alata* was reported to occur in Wetland 3 but this was a mistake and this species does not occur with the permit boundaries.

Submitted by,

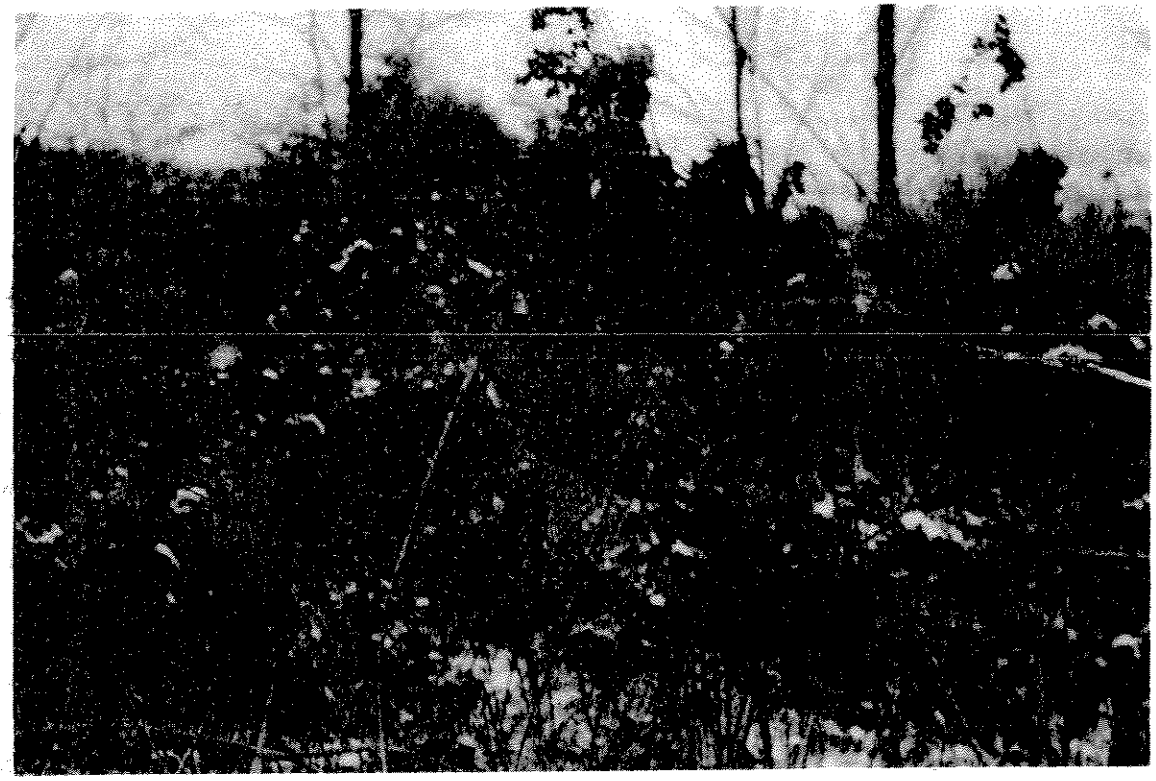
Fred J. Brenner, Ph.D., Certified Senior Ecologist, Certified Wildlife Biologist
Professional Wetland Scientist

Close up photograph of (*Scirpus acutus*) (Syn.*Schoeoplectus acutus*) located at the same location as previous photograph.

Note: A photograph of specimen of *Cladium mariscoides* for the following reasons: 1. the species exists on private property and although wetlands are considered waters of the commonwealth, the species is private property of the property owner. Therefore the collection of this species or trespass on to the property would be an infringement of personal property rights. 2. This species was also identified at this location by Dr. James Bissel and Gordon Buckley and confirmed by Dr. Fred Brenner and 3. In my opinion, it would be unprofessional and unethical to collect or disturb an endangered species especially since the species has been confirmed to exist as this location by three biologists.

Photograph of a stand of (*Scirpus acutus*) (Syn. *Schoenoplectus acutus*) (Lat. 41-00-28.13 Long. 80-04-47.83) located in the large wetland complex north of the road and outside of proposed permit boundaries. This is on of over 12 known locations of this species in the glaciated region of northwest Pennsylvania and this species is available at a least three commercial nurseries.

Photograph of a stand of (*Scirpus acutus*) (Syn. *Schoenoplectus acutus*) (Lat. 41-00-28.13 Long. 80-04-47.83) located in the large wetland complex north of the road and outside of proposed permit boundaries. This is on of over 12 known locations of this species in the glaciated region of northwest Pennsylvania and this species is available at a least three commercial nurseries.



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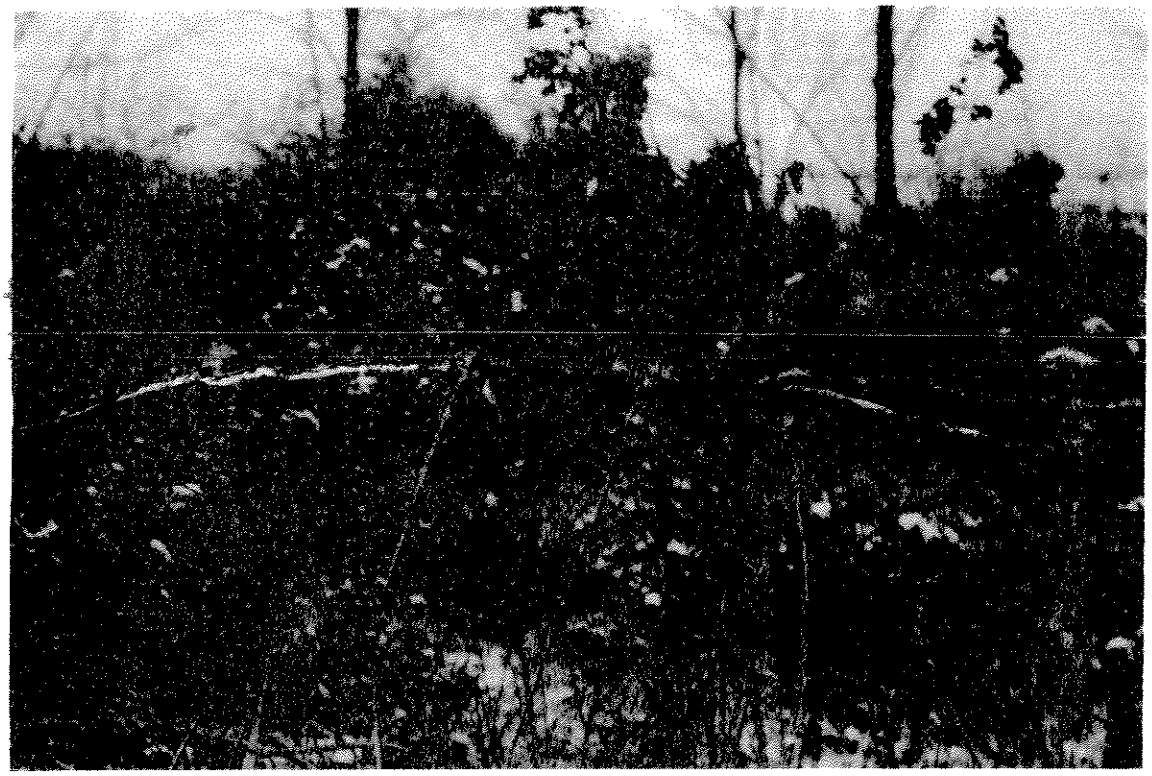

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Identification References

Britten and Brown – An Illustrated Flora of the Northern United States and Canada
Brown – Grasses an Identification Guild (3 volumes)
Conard and Redfearn – How to Know the Mosses and Liverworts
Cronquist – How to Know the Seed Plants
Fassett – Manual of Aquatic Plants
Fernald – Grays Manual of Botany
Gleason and Cronquist Manual of Vascular Plants
Hale – How to know the Lichens
Jaques – Plant Familes
Little – Field Guide to North American Trees
Magee – Freshwater Wetlands – A guide to Common Indicator Plants of the Northeast
Mickel – How to Know the Ferns
Petrides and Wehr – Eastern Trees
Prescott – How to Know the Aquatic Plants
Prescott – How to Know the Freshwater Algae
Prescott – Algae of the Western Great Lakes
Pohl – How to Know the Ferns
Rhodes and Block – The Plants of Pennsylvania
Straubaugh and Core – Flora of West Virginia (4 volumes)
Symonds – The Shrub Identification Book
Over 300 other biological reference books and journals are available in my personnel library.

Submitted by

Fred J. Brenner, Ph.D.
Certified Senior Ecologist,
Certified Wildlife Biologist
Professional Wetland Scientist

Return to Autumn E. Sabo, Ecological Services Section, DCNR/BOF/PNDI, P.O. Box 8552, Harrisburg, PA 17105-8552

# Botanical Field Survey Form for Environmental Review

***If botanist finds species of special concern on site, immediately contact our office at 717-787-7067 or c-asabo@state.pa.us as we will likely want to revisit the population while it is still an appropriate time. Failure to contact our office immediately may result in a delay until next year's growing season.***

*Fill out form multiple times if searched different habitats for species of special concern (SOSC).*

PNDI # 20071211201R5

County Butler | Quad Slippery Rock-Prospect

Survey Date/s 6/30, 7/3, 9/30, 10/1, 2008 | Surveyor Fred J. Brenner Ph.D.

Amount of time spent surveying area Approximately 20 hours

Name of site owner Carl S. Jr. & Norma L. Rodgers

Directions to site west Liberty Road south of Slippery Rock

GPS Coordinates of approximate site center (decimal degrees preferred) Lat. 41-00-17.00 Long. 80-04-37.83

Scientific name/s of target species Cladium mariscoides

Site habitat description wetland below spring

Substrate/soil type Hydric Frenchtown Silt Loam

System: Terrestrial X Palustrine Estuarine

*Community Description (describe below)*

| *Strata/life form* | *Height* | *% Cover* | *Most abundant/characteristic species* |
|---|---|---|---|
| Emergent tree | | | |
| Tree canopy | | | |
| Tree sub-canopy | | | |
| Tall shrub(>1 m) | | | |
| Short shrub(<1 m) | | | |
| Herbaceous | X | 80 | Juncus & Sedge wetland |
| Non-vascular | | | |
| Epiphyte/liana | | | |

Other PA listed species that were not targeted for survey but may potentially exist on site-review PNDI list (http://www.dcnr.state.pa.us/forestry/pndi/fullplants.asp) for species with similar preferred habitat No other SOSC were identified in association with Cladium mariscoides

Estimate of immediate area that is potential habitat for target SOSC Possible Beaver meadow - off site

Return to Autumn E. Sabo, Ecological Services Section, DCNR/BOF/PNDI, P.O. Box 8552, Harrisburg, PA 17105-8552

**Identification problems? If yes, explain.**

**References used (flora, experts, herbaria, etc.)**
Refer to enclosed list of references

**Include topographic map with development site, potential target species habitat, and found populations of SOSC all clearly delineated.** Additional detail is welcome.

**Include photographs of habitat and, if found, SOSC. Submit digital photos electronically.**

If SOSC was/were not found, check all reasons that apply:

| | | | |
|---|---|---|---|
| Ambiguous directions | Disturbances | Exotics | Habitat destroyed |
| ____ Time of year | ____ Unsuitable habitat | ____ Weather | ____ Insufficiently/incompletely surveyed |

Elements may have never occurred here – 1st time area searched

Other:

If previously known from this site, do you believe the species is/are now extirpated? ____ yes ____ no
Explain:

*Botanist only needs to continue if SOSC was/were found on site. Fill out form that follows multiple times if more than one SOSC was located.*

**Directions (within site) to SOSC**
Area below spring on Rodgers property

**GPS coordinates (decimal degrees preferred)**
Lat. 41-00.17.60 Long. 80-04-37.83

Small populations – GPS center point and list radius necessary to enclose whole population
Large populations – GPS multiple points around population perimeter

*Habitat of SOSC (describe below)*

| *Aspect* | *Slope* | *Light* | *Topo Position* | *Moisture* | *Elevation* |
|---|---|---|---|---|---|
| X N | X Flat | X Open | Crest | ____ Inundated (hydric) | Min |
| E | 0-10% | Partial | Upper slope | | Max |
| S | 10-35% | Filtered | Mid-slope | X Saturated (wet-mesic) | |
| W | 35+% | Shaded | Lower slope | | |
| NE | Vertical | | X Bottom | ____ Moist (mesic) | |
| NW | | | | | |
| SE | | | | ____ Dry (mesic) | |
| SW | | | | | |
| None | | | | Dry (xeric) | |

*Plant Biology (describe below)*

| *Phenology* | *Ramets*[1] | *Genets*[2] | | *Population Area* | *Age Structure* | *Vigor* |
|---|---|---|---|---|---|---|
| In leaf | | 1-10 | X | X 1 YD 2 | X Annuals | Very feeble |
| In bud | | 11-50 | | 1-5 YD 2 | % Seedlings | Feeble |
| X In flower | | 51-100 | | 5-10 YD 2 | % Immature | X Normal |
| Immature fruit | | 101-1000 | | 10-100 YD 2 | % 1st year | Vigorous |
| Mature fruit | | 1001-10K | | 100 YD 2 – 2 AC | % Mature | Exceptional vigor |
| Seed dispersing | | 10K+ | | 2+ ACRES | % Senescent | |
| | | EST # | | EST AREA | | |

[1]Ramet: individual reproduced vegetatively (a clone)
[2]Genet: individual generated by sexual reproduction (a seedling)

Return to Autumn E. Sabo, Ecological Services Section, DCNR/BOF/PNDI, P.O. Box 8552, Harrisburg, PA 17105-8552

# Botanical Field Survey Form for Environmental Review

***If botanist finds species of special concern on site, immediately contact our office at 717-787-7067 or c-ausabo@state.pa.us as we will likely want to revisit the population while it is still an appropriate time. Failure to contact our office immediately may result in a delay until next year's growing season.***

*Fill out form multiple times if searched different habitats for species of special concern (SOSC).*

| | |
|---|---|
| PNDI # 20071211120195 | |
| County Butler | Quad Slippery Rock & Prospect |
| Survey Date/s 8/30, 7/31, 8/6, 10/14 2008 | Surveyor Fred J. Brenner |
| Amount of time spent surveying area<br>Approximately 20 hours | |
| Name of site owner Glacial Sand & Gravel | |
| Directions to site West Liberty Road South of Slippery Rock. | |
| GPS Coordinates of approximate site center (decimal degrees preferred)<br>Lat. 41-00-28.13 Long. 80-04-42.33 | |
| Scientific name/s of target species<br>Scirpus acutus | |
| Site habitat description<br>Jurisdictional wetland | |
| Substrate/soil type Hydric Frenchtown silt Loam | |
| System: Terrestrial Palustrine Estuarine | |

*Community Description (describe below)*

| *Strata/life form* | *Height* | *% Cover* | *Most abundant/characteristic species* |
|---|---|---|---|
| Emergent tree | | | |
| Tree canopy | | | |
| Tree sub-canopy | | | |
| Tall shrub(>1 m) | | | |
| Short shrub(<1 m) | | | |
| Herbaceous | X | 80 | Typha latifolia, Juncus spp. |
| Non-vascular | | | |
| Epiphyte/liana | | | |

Other PA listed species that were not targeted for survey but may potentially exist on site-review PNDI list (http://www.dcnr.state.pa.us/forestry/pndi/nlplants.asp) for species with similar preferred habitat No other SOSC were identified in association with Scirpus latifolia

Estimate of immediate area that is potential habitat for target SOSC
Large wetland system. North of West Liberty Road - Potential for Scirpus acutus

Return to Autumn E. Sabo, Ecological Services Section, DCNR/BOF/PNDI, P.O. Box 8552, Harrisburg, PA 17105-8552

**Biology comments**

Population size, relative to other occurrences you have observed (state whether full extent of occurrences is known) Similar to other known populations in North west Pennsylvania

Age, successional stage of system
System developed as result of Glacial Activity

____ Known or ____ Inferred land use history
May have been Farmed

Chemical treatment (known or suspected) with herbicides, pesticides, other
Not in recent history

Other anthropogenic or unnatural disturbance

Integrity/fragmentation of community
NA

List of invasive species (alien or native)
Multiflora Rose

Threats (on-site) None

Threats (off-site) None

List other members of this genus that occur on site. Hybridization?
Scirpus validus also occurs on site

Specimen taken? Specimen label data, repository and number
Endangered species should not be collected.

Conservation recommendations (include details on how to best avoid, minimize, and mitigate impacts)

Develop a recovery plan for Scirpus ocotus and other species of special concern in Pennsylvania

Return to Autumn E. Sabo, Ecological Services Section, DCNR/BOF/PNDI, P.O. Box 8552, Harrisburg, PA 17105-8552

Identification problems? If yes, explain.

References used (flora, experts, herbaria, etc.)

Refer to enclosed references

**Include topographic map with development site, potential target species habitat, and found populations of SOSC all clearly delineated.** Additional detail is welcome.

**Include photographs of habitat and, if found, SOSC.** Submit digital photos electronically.

If SOSC was/were not found, check all reasons that apply:

| | | | |
|---|---|---|---|
| Ambiguous directions | Disturbances | Exotics | Habitat destroyed |
| ____ Time of year | ____ Unsuitable habitat | ____ Weather | ____ Insufficiently/incompletely surveyed |

Elements may have never occurred here -- 1st time area searched

Other:

If previously known from this site, do you believe the species is/are now extirpated? ____ yes ____ no
Explain:

*Botanist only needs to continue if SOSC was/were found on site. Fill out form that follows multiple times if more than one SOSC was located.*

Directions (within site) to SOSC

Approximately in center of large wetland North of West Liberty Road

GPS coordinates (decimal degrees preferred)

Lat. 41-00-28.13

Long. 80-04-47.88

Small populations – GPS center point and list radius necessary to enclose whole population
Large populations – GPS multiple points around population perimeter

*Habitat of SOSC (describe below)*

| *Aspect* | *Slope* | *Light* | *Topo Position* | *Moisture* | *Elevation* |
|---|---|---|---|---|---|
| X N | X Flat | X Open | Crest | Inundated | Min |
| E | 0-10% | Partial | Upper slope | (hydric) | Max |
| S | 10-35% | Filtered | Mid-slope | X Saturated | |
| W | 35-90 | Shaded | Lower slope | (wet-mesic) | |
| NE | Vertical | | X Bottom | Moist | |
| NW | | | | (mesic) | |
| SE | | | | Dry | |
| SW | | | | (mesic) | |
| None | | | | Dry (xeric) | |

*Plant Biology (describe below)*

| *Phenology* | *Ramets*[1] | *Genets*[2] | | *Population Area* | *Age Structure* | *Vigor* |
|---|---|---|---|---|---|---|
| In leaf | | 1-10 | X | 1 YD 2 | Annuals | Very feeble |
| In bud | | 11-50 | | X 1-5 YD 2 | % Seedlings | Feeble |
| In flower | | 51-100 | | 5-10 YD 2 | % Immature | Normal |
| Immature fruit | | 101-1000 | | 10-100 YD 2 | % 1st year | X Vigorous |
| Mature fruit | | 1001-10K | | 100 YD 2 – 2 AC | X % Mature | Exceptional vigor |
| X Seed dispersing | | 10K+ | | 2+ ACRES | % Senescent | |

[1]Ramet: individual reproduced vegetatively (a clone)
[2]Genet: individual generated by sexual reproduction (a seedling)

Return to Autumn E. Sabo, Ecological Services Section, DCNR/BOF/PNDI, P.O. Box 8552, Harrisburg, PA 17105-8552

| |
|---|
| Biology comments |
| Population size, relative to other occurrences you have observed (state whether full extent of occurrences is known) Do not know of other populations |
| Age, successional stage of system Beaver Activity |
| ____ Known or _x_ Inferred land use history Agriculture adjacent to site |
| Chemical treatment (known or suspected) with herbicides, pesticides, other Not Known |
| Other anthropogenic or unnatural disturbance |
| Integrity/fragmentation of community Isolated Population |
| List of invasive species (alien or native) Multiflora Rose |
| Threats (on-site) Farming |
| Threats (off-site) Farming |
| List other members of this genus that occur on site. Hybridization? |
| Specimen taken? Specimen label data, repository and number Should not collect endangered species |
| Conservation recommendations (include details on how to best avoid, minimize, and mitigate impacts) Develop Recovery Plan for Cladium mariscoides and other species of special concern in Pennsylvania |

## Michal Jones

**From:** Yeakle, Christopher [cyeakle@state.pa.us]
**Sent:** Monday, November 17, 2008 11:40 AM
**To:** mjones@eadsgroup.com
**Subject:** FW: re-determination

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

**Categories:** Red Category

Here is the email

Chris Yeakle
Mining Permit & Compliance Specialist
PA Department of Environmental Protection
Knox District Mining Office
(814) 797-1191

-----Original Message-----
**From:** Buckley, Gordon
**Sent:** Monday, November 17, 2008 9:50 AM
**To:** Yeakle, Christopher
**Subject:** FW: re-determination

FYI

-----Original Message-----
**From:** James Bissell [mailto:j24bissell@roadrunner.com]
**Sent:** Sunday, November 16, 2008 11:31 PM
**To:** Buckley, Gordon
**Subject:** re-determination

Gordon,

The wood-rush collected June 3 on West Liberty Esker is not the rare *Luzula bulbosa*. It is a common wood-rush, *Luzula multiflora*.

On Saturday afternoon I was preparing the wood rush for mounting that I collected on West Liberty Esker with you and Chris. The most important character for separating *Luzula bulbosa* from other native wood-rushes is white tubers that develop within sterile, overwintering shoot buds at the base of the plant. The combination of white tubers, multiple-flowered spikes and ascending peduncles in the inflorescence separates the *Luzula bulbosa* from all other native wood rushes. I noticed the white tubers on one of the plants when we returned to our vehicles and that is why I stopped to collect it in the thunderstorm. I checked for the tubers on the specimen for the Museum Herbarium when I wrote the letter requested by Chris and even made a note to the person who would be mounting the specimen, asking her to make sure the two white tubers are facing up when she mounted the specimen. I also collected three duplicates. I was not concerned the tubers were not evident on the duplicate specimens because they are usually hidden by dead leaf bases at the base of the plant. I pulled away some of the dead leaf bases on the primary specimen and found no more tubers. I then decided to expose the tubers on the duplicates. In most cases there are a minimum of two white tubers at the base of *Luzula bulbosa* plants. I was unable to find any white tubers on the first duplicate and became immediately suspicious that the white tuber-like structures at the base of the plant may be a hard, dry fungus. I checked the second duplicate and then the third duplicate and found no tubers on them. After finding no tubers on all three duplicates I was convinced the structures on the main specimen were probably not tubers. I then pulled the specimen with the obvious white tubers. The surface of both tubers were damaged and this often happens in the process of

digging. I was especially ruthless in the digging process due to the close lightning and thunder. What appeared to be "white tubers" with the hard outer surface scratched away is probably a hard white fungus or some other white substance. The fact that the duplicate specimens had no tubers convinced me the plant I noticed with the very obvious white tubers is a red herring that threw me off. After convincing myself that the white, rather hard substance in the sterile shoots was not produced by the plant, I checked the secondary characters that separate *Luzula bulbosa* from *Luzula mutliflora*, and the tepals were a bit longer than the Luzula bulbosa specimens in our herbarium. The tepals on the West Liberty Esker plants are within the range for the species but many flower and spike characters of *Luzula bulbosa* and *Luzula multiflora* overlap.

I stayed a bit late and wrote a letter to Chris to inform him about the change from *Luzula bulbosa* to *Luzula multiflora*. The letter will be mailed tomorrow afternoon. **Would you please forward this email to Chris so that he can inform the gravel company there are no rare plants in the dry meadow on the south side of the road.**

Jim

23 October 2008

Chris Yeakle
Mining Permit & Compliance Specialist
PA Department of Environmental Protection
Knox District Mining Office
P.O. Box 669
Knox, PA 16232

Dear Chris,

Thank you for inviting me to join you and DEP biologist Gordon Buckley on June 3 and September 3 for a survey of the wetlands along the north slope of the West Liberty Esker in Butler County. It was a pleasure having Botanist Steve Grund and Ecology Peter Woods on the second day of the survey. All the historical Endangered and Threatened plants reported for the wetlands are species that occur in Sedge-Alder Fens or open emergent marshes associated with Sedge-Alder Fens. Only one State Threatened fen species, winged sedge (*Carex alata*), was found within the spring seeps on the north side of the esker during our two-day survey. However, several fen indicator species were encountered during the two-day survey, including winged sedge, interior sedge (*Carex interior*), swamp thistle (*Cirsium muticum*), poison sumac (*Toxicodendron vernix*), speckled alder (*Alnus incana*) and ninebark (*Physocarpus opulifolius*). The interior sedge and swamp thistle are exceptionally restricted to the glacial fen community. Poison sumac, speckled alder and ninebark are usually common within glacial fens but also occur in several other types of wetlands within Pennsylvania. Another rare plant, typical of Oak Barrens and new to Butler County, southern wood rush (*Luzula bulbosa*), was locally common in the dry meadow where we parked to the west of the high quality wetlands where we collected the sample of Canadian burnett. Based upon the winged sedge and the fen indicator species within the springs, the wetlands along the north slope of the esker are Exceptional Value Wetlands in Pennsylvania.

The current ranking of southern wood rush is S1/TU. The S1 status suggests there are few enough records to rank the species as Endangered in Pennsylvania. I checked the number of records known for this species in Pennsylvania. There are only seven previous records for southern wood rush in Pennsylvania, two of which are extirpated and the other five are historical records. Until collected by you, Gordon and myself on June 3, the plant had not been observed in PA since 1971. The Plant Technical Committee of the PA Biological Survey has approved ranking the plants as the Endangered level, but the status will not be official until the State Regulatory Statutes are changed.

The rare plants of Alder-Sedge Fens are generally restricted to the sedge meadow openings. Sedge meadow openings become invaded by shrubs and trees over time. Most of the rare species historically recorded for the fen only grow within open fens or open emergent marshes. As the fen meadow openings are shaded out, the rare fen species are not able to persist but remain at the site, dormant within the seed bank under the shade of trees and shrubs until a natural disturbance, such as massive blow-down of trees or beaver flooding, and the consequent killing of the trees renews the opening. There is a good probability all the rare species that documented this site historically will be restored to the site in response to a future disturbance and restoration of the fen. Some of the finest fens recently discovered within Pennsylvania are fen springs recently released by a breach of a beaver dam that flooded a seepage system formerly covered by trees and shrubs.

Enclosed is a map showing the site where the state threatened winged sedge was collected. The map also shows the collection site for the southern wood rush, the wetland that supports the Canadian burnett and one of two spring seeps where fen indicator species were observed. A list of plants observed within the wetlands near the esker is also enclosed. The GPS coordinates for the winged sedge are: 80.080332 and 41.006173.

The Museum is always willing to conduct inventories for the Knox District Mining Office.

Sincerely,

Dr. James K. Bissell
Curator of Botany
Director of Conservation

Enclosures

# Plants of West Liberty Esker Wetlands

Acer rubrum (red maple),
Agrimonia gryposepala (agrimony),
Agrimonia parviflora (southern agrimony),
Alnus incana ssp. rugosa (speckled alder),
Amphicarpaea bracteata (hog-peanut),
Angelica sp. (angelica),
Apios americana (ground-nut),
Arctium sp. (burdock),
Bidens frondosa (beggar-ticks),
Carex alata (broad-winged sedge),
Carex atlantica ssp. capillacea (bog sedge),
Carex cristatella (sedge),
Carex interior (sedge),
Carex lurida (sedge),
Carex projecta (sedge),
Carex scoparia (sedge),
Chelone glabra (turtlehead),
Cinna arundinacea (stout woodreed),
Circaea sp. (enchanter's nightshade)
Cirsium muticum (swamp thistle),
Clematis virginiana (virgin's-bower),
Cornus amomum (silky dogwood),
Crataegus sp. (hawthorn),
Dichanthelium clandestinum (deer-tongue grass),
Dryopteris carthusiana (spinulose wood fern),
Dryopteris cristata (crested wood fern),
Echinochloa sp. (barnyard grass),
Epilobium coloratum (purple-leaved willow-herb),
Eupatoriadelphus maculatus var. maculatus (spotted Joe-Pye-weed),
Eupatorium perfoliatum (boneset),
Geum canadense (white avens),
Glechoma hederacea (gill-over-the-ground),
Glyceria canadensis (rattlesnake mannagrass),
Glyceria striata (fowl mannagrass),
Hackelia virginiana (beggar's-lice),
Hydrocotyle americana (marsh pennywort),
Impatiens capensis (jewelweed),
Leersia oryzoides (rice cutgrass),
Lemna minor (duckweed),
Lobelia siphilitica (great blue lobelia),
Lonicera morrowii (Morrow's honeysuckle),
Lycopus uniflorus (bugleweed),
Muhlenbergia sp. (muhly),
Nuphar sp. (spatterdock),
Onoclea sensibilis (sensitive fern),
Osmunda cinnamomea (cinnamon fern),
Osmunda regalis (royal fern),
Parthenocissus quinquefolia (Virginia-creeper),
Phalaris arundinacea (reed canary-grass),
Physocarpus opulifolius (ninebark),
Phytolacca americana (pokeweed),
Pilea pumila (clearweed),

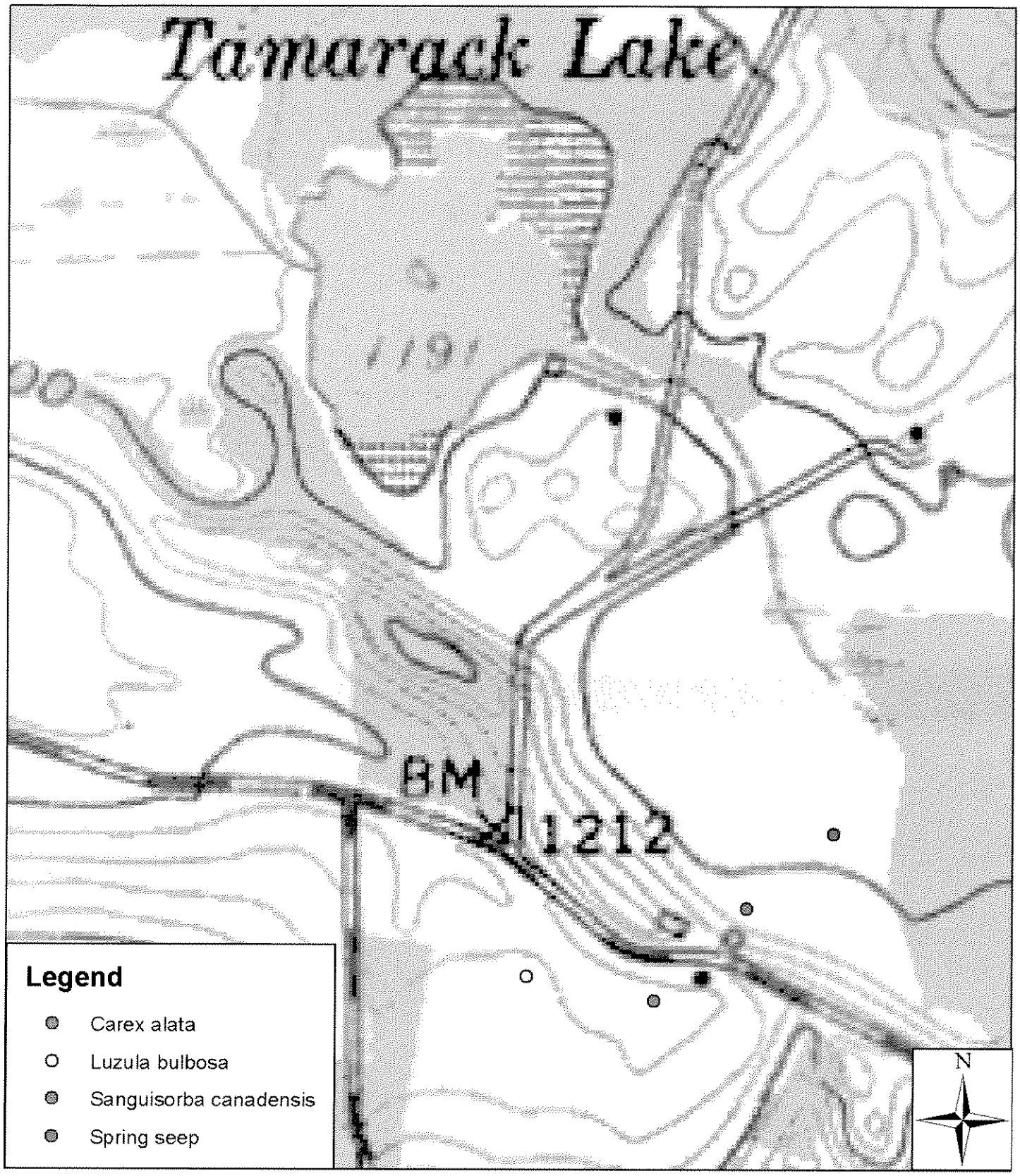
# Plants of West Liberty Esker Wetlands

Polygonum arifolium (halberd-leaved tear-thumb),
Polygonum punctatum (water-pepper),
Polygonum sagittatum (tearthumb),
Populus tremuloides (quaking aspen),
Prunella vulgaris (heal-all),
Ranunculus hispidus (buttercup),
Rosa multiflora (multiflora rose),
Rosa palustris (swamp rose),
Rubus idaeus (red raspberry),
Rubus pubescens (dwarf raspberry),
Salix sericea (silky willow),
Sambucus nigra ssp. canadensis (elderberry),
Schoenoplectus tabernaemontani (soft-stem bulrush),
Scirpus cf hattorianus (bulrush),
Solanum carolinense (horse-nettle),
Solidago altissima (late goldenrod),
Solidago canadensis (Canada goldenrod),
Solidago gigantea (late goldenrod),
Solidago patula (rough-leaved goldenrod),
Solidago rugosa (wrinkle-leaf goldenrod),
Spiraea alba (meadow-sweet),
Symphyotrichum lateriflorum (calico aster),
Symphyotrichum puniceum (purple-stemmed aster),
Symplocarpus foetidus (skunk-cabbage),
Thalictrum pubescens (tall meadow-rue),
Thelypteris palustris (marsh fern),
Toxicodendron radicans (poison-ivy),
Toxicodendron vernix (poison sumac),
Tussilago farfara (coltsfoot),
Urtica dioica (stinging nettle),
Verbena hastata (blue vervain),
Vernonia sp. (ironweed),
Viburnum lentago (nannyberry)
Viburnum recognitum (arrow-wood),
Viburnum sp. (viburnum),

10/23/2008

Cleveland Museum of NATURAL HISTORY

# Tamarack Lake
## Slippery Rock Quad, Butler County, PA




0 0.125 0.25 0.5 Kilometers