# Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| # | Question | Circle one | |
|---|---|---|---|
| 1 | **Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | NO<br><br>Go to Question 2 |
| 2 | **Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species? | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 3 | NO<br><br>Go to Question 3 |
| 3 | **Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 4 | NO<br><br>Go to Question 4 |
| 4 | **Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 5 | NO<br><br>Go to Question 5 |
| 5 | **Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation? | YES<br><br>Wetland is a Category 1 wetland<br><br>Go to Question 6 | NO<br><br>Go to Question 6 |
| 6 | **Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 7 | NO<br><br>Go to Question 7 |
| 7 | **Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 8a | NO<br><br>Go to Question 8a |
| 8a | **"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs? | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 8b | NO<br><br>Go to Question 8b |

| | | | |
|---|---|---|---|
| 8b | **Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh? | YES<br><br>Wetland should be evaluated for possible Category 3 status.<br><br>Go to Question 9a | NO<br><br>Go to Question 9a |
| 9a | **Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish? | YES<br><br>Go to Question 9b | NO<br><br>Go to Question 10 |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 9c |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation. | YES<br><br>Go to Question 9d | NO<br><br>Go to Question 10 |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 10 | NO<br><br>Go to Question 9e |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 10 |
| 10 | **Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 11 | NO<br><br>Go to Question 11 |
| 11 | **Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Complete Quantitative Rating | NO<br><br>Complete Quantitative Rating |

**Table 1. Characteristic plant species.**

| invasive/exotic spp | fen species | bog species | 0ak Opening species | wet prairie species |
|---|---|---|---|---|
| *Lythrum salicaria* | *Zygadenus elegans var. glaucus* | *Calla palustris* | *Carex cryptolepis* | *Calamagrostis canadensis* |
| *Myriophyllum spicatum* | *Cacalia plantaginea* | *Carex atlantica var. capillacea* | *Carex lasiocarpa* | *Calamogrostis stricta* |
| *Najas minor* | *Carex flava* | *Carex echinata* | *Carex stricta* | *Carex atherodes* |
| *Phalaris arundinacea* | *Carex sterilis* | *Carex oligosperma* | *Cladium mariscoides* | *Carex buxbaumii* |
| *Phragmites australis* | *Carex stricta* | *Carex trisperma* | *Calamagrostis stricta* | *Carex pellita* |
| *Potamogeton crispus* | *Deschampsia caespitosa* | *Chamaedaphne calyculata* | *Calamagrostis canadensis* | *Carex sartwellii* |
| *Ranunculus ficaria* | *Eleocharis rostellata* | *Decodon verticillatus* | *Quercus palustris* | *Gentiana andrewsii* |
| *Rhamnus frangula* | *Eriophorum viridicarinatum* | *Eriophorum virginicum* | | *Helianthus grosseserratus* |
| *Typha angustifolia* | *Gentianopsis spp.* | *Larix laricina* | | *Liatris spicata* |
| *Typha xglauca* | *Lobelia kalmii* | *Nemopanthus mucronatus* | | *Lysimachia quadriflora* |
| | *Parnassia glauca* | *Schechzeria palustris* | | *Lythrum alatum* |
| | *Potentilla fruticosa* | *Sphagnum spp.* | | *Pycnanthemum virginianum* |
| | *Rhamnus alnifolia* | *Vaccinium macrocarpon* | | *Silphium terebinthinaceum* |
| | *Rhynchospora capillacea* | *Vaccinium corymbosum* | | *Sorghastrum nutans* |
| | *Salix candida* | *Vaccinium oxycoccos* | | *Spartina pectinata* |
| | *Salix myricoides* | *Woodwardia virginica* | | *Solidago riddellii* |
| | *Salix serissima* | *Xyris difformis* | | |
| | *Solidago ohioensis* | | | |
| | *Tofieldia glutinosa* | | | |
| | *Triglochin maritimum* | | | |
| | *Triglochin palustre* | | | |

**End of Narrative Rating. Begin Quantitative Rating on next page.**

ORAM v. 5.0 Field Form Quantitative Rating

| Site: AEP VI-Wet | Rater(s): JA | Date: 7/8/13 |
|---|---|---|

## Metric 1. Wetland Area (size).

| 0 | 0 |
|---|---|
| max 6 pts. | subtotal |

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [x] <0.1 acres (0.04ha) (0 pts)

## Metric 2. Upland buffers and surrounding land use.

| 8 | 8 |
|---|---|
| max 14 pts. | subtotal |

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [x] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

4

2b. Intensity of surrounding land use. Select one or double check and average.

- [x] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

4

## Metric 3. Hydrology.

| 9 | 17 |
|---|---|
| max 30 pts. | subtotal |

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

1

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

0

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [x] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

2

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

3

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

## Metric 4. Habitat Alteration and Development.

| 7.5 | 24.5 |
|---|---|
| max 20 pts. | subtotal |

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

2.5

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

2

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

3

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [x] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [x] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

| 24.5 |
|---|
| subtotal this page |

last revised 1 February 2001 jjm

| Site: | Rater(s): | Date: |
|---|---|---|

245
subtotal first page

| 0 | 24.5 |
|---|---|
| max 10 pts. | subtotal |

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

| 7 | 31.5 |
|---|---|
| max 20 pts. | subtotal |

## Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ 0 ] Emergent
- [ 1 ] Shrub
- [ 2 ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

3

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [ ✓ ] Low (1)
- [ ] None (0)

1

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ✓ ] Absent (1)

1

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [ 1 ] Coarse woody debris >15cm (6in)
- [ 0 ] Standing dead >25cm (10in) dbh
- [ 1 ] Amphibian breeding pools

2

**Vegetation Community Cover Scale**

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

**Narrative Description of Vegetation Quality**

| | |
|---|---|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

**Mudflat and Open Water Class Quality**

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

**Microtopography Cover Scale**

| | |
|---|---|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

31.5

**End of Quantitative Rating. Complete Categorization Worksheets.**

# ORAM Summary Worksheet

| | | circle answer or insert score | Result |
|---|---|---|---|
| Narrative Rating | Question 1 Critical Habitat | YES NO | If yes, Category 3. |
| | Question 2. Threatened or Endangered Species | YES NO | If yes, Category 3. |
| | Question 3. High Quality Natural Wetland | YES NO | If yes, Category 3. |
| | Question 4. Significant bird habitat | YES NO | If yes, Category 3. |
| | Question 5. Category 1 Wetlands | YES NO | If yes, Category 1. |
| | Question 6. Bogs | YES NO | If yes, Category 3. |
| | Question 7. Fens | YES NO | If yes, Category 3. |
| | Question 8a. Old Growth Forest | YES NO | If yes, Category 3. |
| | Question 8b. Mature Forested Wetland | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9b. Lake Erie Wetlands - Restricted | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9d. Lake Erie Wetlands – Unrestricted with native plants | YES NO | If yes, Category 3 |
| | Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 10. Oak Openings | YES NO | If yes, Category 3 |
| | Question 11. Relict Wet Prairies | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| Quantitative Rating | Metric 1. Size | 0 | |
| | Metric 2. Buffers and surrounding land use | 9 | |
| | Metric 3. Hydrology | 9 | |
| | Metric 4. Habitat | 7.5 | |
| | Metric 5. Special Wetland Communities | 0 | |
| | Metric 6. Plant communities, interspersion, microtopography | 7 | |
| | TOTAL SCORE | 31.5 | Category based on score breakpoints 1/2 Gray zone |

CAT 1-2 gray zone - consider CAT 2

**Complete Wetland Categorization Worksheet.**

# Wetland Categorization Worksheet

| Choices | Circle one | | Evaluation of Categorization Result of ORAM |
|---|---|---|---|
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10 | YES<br><br>Wetland is categorized as a Category 3 wetland | NO | Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM |
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11 | YES<br><br>Wetland should be evaluated for possible Category 3 status | NO | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category. |
| Did you answer "Yes" to<br><br>Narrative Rating No. 5 | YES<br><br>Wetland is categorized as a Category 1 wetland | NO | Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland? | YES<br><br>Wetland is assigned to the appropriate category based on the scoring range | NO | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score. |
| Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands? | YES<br><br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria | NO | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C). |
| Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br><br>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br><br>Wetland is assigned to category as determined by the ORAM. | A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided. |

**Final Category**

| Choose one | Category 1 | Category 2 | Category 3 |
|---|---|---|---|

## End of Ohio Rapid Assessment Method for Wetlands.

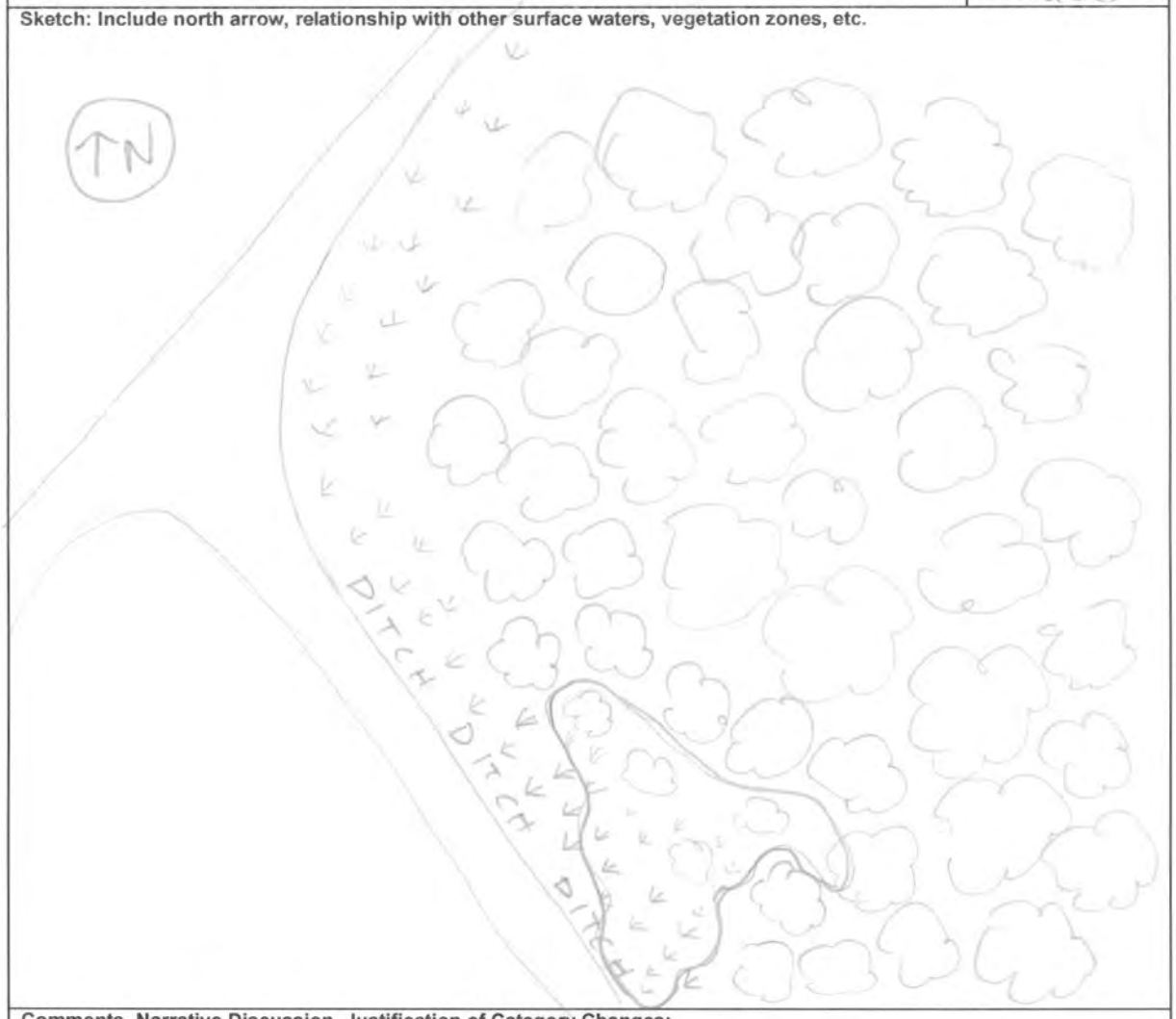
# Background Information

| | |
|---|---|
| **Name:** Jenny Adkins | |
| **Date:** 7/9/13 | |
| **Affiliation:** MAD Scientist + Associates | |
| **Address:** 253 N. State Street, Suite 101, Westerville, OH 43081 | |
| **Phone Number:** 614-818-9156 | |
| **e-mail address:** JennyA@madscientistassociates.net | |
| **Name of Wetland:** W1-wet | |
| **Vegetation Communit(ies):** Forested Slope, Emergent meadow | |
| **HGM Class(es):** Depression, surface water + ground | |
| **Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.** | |

| | |
|---|---|
| Lat/Long or UTM Coordinate | 40.189017° -81.864207° |
| USGS Quad Name | Wills Creek |
| County | Coshocton |
| Township | T4N |
| Section and Subsection | S12 R6W |
| Hydrologic Unit Code | 05040004 |
| Site Visit | 7/8/13 |
| National Wetland Inventory Map | NONE |
| Ohio Wetland Inventory Map | — |
| Soil Survey | WaB |
| Delineation report/map | |

| | |
|---|---|
| **Name of Wetland:** W1-wet | |
| **Wetland Size (acres, hectares):** | 0.11 acres |

**Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.**




**Comments, Narrative Discussion, Justification of Category Changes:**

Mixed forested/emergent wet meadow
Apparent surface water + ground seeps running downslope.
High quality emergent veg. species: Carex lurida
Carex vulpen.
Onoclea sensibilis
Leersia oryzoides
Extends into roadside ditch (drains)
Culverted to the southeast
Acid mine influence

| | |
|---|---|
| **Final score :** 40.5 | **Category:** |

# Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| # | Steps in properly establishing scoring boundaries | done? | not applicable |
|---|---|---|---|
| Step 1 | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc. | ✓ | |
| Step 2 | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | ✓ | |
| Step 3 | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary. | ✓ | |
| Step 4 | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes. | ✓ | |
| Step 5 | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately. | | ✓ |
| Step 6 | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications. | | ✓ |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

# Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| # | Question | Circle one | |
|---|---|---|---|
| 1 | **Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | NO<br><br>Go to Question 2 |
| 2 | **Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species? | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 3 | NO<br><br>Go to Question 3 |
| 3 | **Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 4 | NO<br><br>Go to Question 4 |
| 4 | **Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 5 | NO<br><br>Go to Question 5 |
| 5 | **Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria*, or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation? | YES<br><br>Wetland is a Category 1 wetland<br><br>Go to Question 6 | NO<br><br>Go to Question 6 |
| 6 | **Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 7 | NO<br><br>Go to Question 7 |
| 7 | **Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 8a | NO<br><br>Go to Question 8a |
| 8a | **"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs? | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 8b | NO<br><br>Go to Question 8b |

| | | | |
|---|---|---|---|
| 8b | **Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh? | YES<br><br>Wetland should be evaluated for possible Category 3 status.<br><br>Go to Question 9a | NO<br><br>Go to Question 9a |
| 9a | **Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish? | YES<br><br>Go to Question 9b | NO<br><br>Go to Question 10 |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 9c |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation. | YES<br><br>Go to Question 9d | NO<br><br>Go to Question 10 |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 10 | NO<br><br>Go to Question 9e |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 10 |
| 10 | **Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 11 | NO<br><br>Go to Question 11 |
| 11 | **Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Complete Quantitative Rating | NO<br><br>Complete Quantitative Rating |

**Table 1. Characteristic plant species.**

| invasive/exotic spp | fen species | bog species | 0ak Opening species | wet prairie species |
|---|---|---|---|---|
| *Lythrum salicaria* | *Zygadenus elegans var. glaucus* | *Calla palustris* | *Carex cryptolepis* | *Calamagrostis canadensis* |
| *Myriophyllum spicatum* | *Cacalia plantaginea* | *Carex atlantica var. capillacea* | *Carex lasiocarpa* | *Calamogrostis stricta* |
| *Najas minor* | *Carex flava* | *Carex echinata* | *Carex stricta* | *Carex atherodes* |
| *Phalaris arundinacea* | *Carex sterilis* | *Carex oligosperma* | *Cladium mariscoides* | *Carex buxbaumii* |
| *Phragmites australis* | *Carex stricta* | *Carex trisperma* | *Calamagrostis stricta* | *Carex pellita* |
| *Potamogeton crispus* | *Deschampsia caespitosa* | *Chamaedaphne calyculata* | *Calamagrostis canadensis* | *Carex sartwellii* |
| *Ranunculus ficaria* | *Eleocharis rostellata* | *Decodon verticillatus* | *Quercus palustris* | *Gentiana andrewsii* |
| *Rhamnus frangula* | *Eriophorum viridicarinatum* | *Eriophorum virginicum* | | *Helianthus grosseserratus* |
| *Typha angustifolia* | *Gentianopsis spp.* | *Larix laricina* | | *Liatris spicata* |
| *Typha xglauca* | *Lobelia kalmii* | *Nemopanthus mucronatus* | | *Lysimachia quadriflora* |
| | *Parnassia glauca* | *Schechzeria palustris* | | *Lythrum alatum* |
| | *Potentilla fruticosa* | *Sphagnum spp.* | | *Pycnanthemum virginianum* |
| | *Rhamnus alnifolia* | *Vaccinium macrocarpon* | | *Silphium terebinthinaceum* |
| | *Rhynchospora capillacea* | *Vaccinium corymbosum* | | *Sorghastrum nutans* |
| | *Salix candida* | *Vaccinium oxycoceos* | | *Spartina pectinata* |
| | *Salix myricoides* | *Woodwardia virginica* | | *Solidago riddellii* |
| | *Salix serissima* | *Xyris difformis* | | |
| | *Solidago ohioensis* | | | |
| | *Tofieldia glutinosa* | | | |
| | *Triglochin maritimum* | | | |
| | *Triglochin palustre* | | | |

**End of Narrative Rating. Begin Quantitative Rating on next page.**

| Site: W1-wet | Rater(s): JA | Date: 7/8/13 |
|---|---|---|

30.5
subtotal first page

## Metric 5. Special Wetlands.

| 0 | 30.5 |
|---|---|
| max 10 pts | subtotal |

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

## Metric 6. Plant communities, interspersion, microtopography.

| 10 | 40.5 |
|---|---|
| max 20 pts | subtotal |

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [2] Emergent ✓
- [1] Shrub ✓
- [1] Forest ✓
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

4

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [✓] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

3

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [✓] Absent (1)

1

6d. Microtopography.
Score all present using 0 to 3 scale.

- [1] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

2

**Vegetation Community Cover Scale**

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

**Narrative Description of Vegetation Quality**

| | |
|---|---|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

**Mudflat and Open Water Class Quality**

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

**Microtopography Cover Scale**

| | |
|---|---|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

40.5

**End of Quantitative Rating. Complete Categorization Worksheets.**

| Site: W1 wet | Rater(s): JA | Date: 7/8/13 |
|---|---|---|

30.5
subtotal first page

## Metric 5. Special Wetlands.

| 0 | 30.5 |
|---|---|
| max 10 pts. | subtotal |

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

## Metric 6. Plant communities, interspersion, microtopography.

| 10 | 40.5 |
|---|---|
| max 20 pts. | subtotal |

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [2] Emergent ✓
- [1] Shrub ✓
- [1] Forest ✓
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

4

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [✓] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

3

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [✓] Absent (1)

1

6d. Microtopography.
Score all present using 0 to 3 scale.

- [1] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [1] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

2

**Vegetation Community Cover Scale**

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

**Narrative Description of Vegetation Quality**

| | |
|---|---|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

**Mudflat and Open Water Class Quality**

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

**Microtopography Cover Scale**

| | |
|---|---|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

40.5

**End of Quantitative Rating. Complete Categorization Worksheets.**

# ORAM Summary Worksheet

| | | circle answer or insert score | Result |
|---|---|---|---|
| Narrative Rating | Question 1 Critical Habitat | YES NO | If yes, Category 3. |
| | Question 2. Threatened or Endangered Species | YES NO | If yes, Category 3. |
| | Question 3. High Quality Natural Wetland | YES NO | If yes, Category 3. |
| | Question 4. Significant bird habitat | YES NO | If yes, Category 3. |
| | Question 5. Category 1 Wetlands | YES NO | If yes, Category 1. |
| | Question 6. Bogs | YES NO | If yes, Category 3. |
| | Question 7. Fens | YES NO | If yes, Category 3. |
| | Question 8a. Old Growth Forest | YES NO | If yes, Category 3. |
| | Question 8b. Mature Forested Wetland | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9b. Lake Erie Wetlands - Restricted | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9d. Lake Erie Wetlands – Unrestricted with native plants | YES NO | If yes, Category 3 |
| | Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 10. Oak Openings | YES NO | If yes, Category 3 |
| | Question 11. Relict Wet Prairies | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| Quantitative Rating | Metric 1. Size | 1 | |
| | Metric 2. Buffers and surrounding land use | 8 | |
| | Metric 3. Hydrology | 11.5 | |
| | Metric 4. Habitat | 10 | |
| | Metric 5. Special Wetland Communities | 0 | |
| | Metric 6. Plant communities, interspersion, microtopography | 10 | |
| | TOTAL SCORE | 40.5 | Category based on score breakpoints Mod 2 |

**Complete Wetland Categorization Worksheet.**

# Wetland Categorization Worksheet

| Choices | Circle one | | Evaluation of Categorization Result of ORAM |
|---|---|---|---|
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10 | YES<br><br>Wetland is categorized as a Category 3 wetland | NO | Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM |
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11 | YES<br><br>Wetland should be evaluated for possible Category 3 status | NO | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category. |
| Did you answer "Yes" to<br><br>Narrative Rating No. 5 | YES<br><br>Wetland is categorized as a Category 1 wetland | NO | Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland? | YES<br><br>Wetland is assigned to the appropriate category based on the scoring range | NO | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score. |
| Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands? | YES<br><br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria | NO | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C). |
| Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br><br>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br><br>Wetland is assigned to category as determined by the ORAM. | A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided |

**Final Category**

| Choose one | Category 1 | Category 2 | Category 3 |
|---|---|---|---|

## End of Ohio Rapid Assessment Method for Wetlands.

# Background Information

| | |
|---|---|
| **Name:** | MAD Scientist & Associates (MAD) |
| **Date:** | 10/15/13 |
| **Affiliation:** | MAD |
| **Address:** | 253 N. State St. Suite 101 Westerville, OH 43081 |
| **Phone Number:** | (614) 818-9156 |
| **e-mail address:** | luke@madscientistassociates.net |
| **Name of Wetland:** | X |
| **Vegetation Communit(ies):** | emergent |
| **HGM Class(es):** | Depressional |

**Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.**

Please see attached map

| | |
|---|---|
| Lat/Long or UTM Coordinate | 40.189928 -81.848740 |
| USGS Quad Name | Wills Creek |
| County | Coshocton |
| Township | T4N |
| Section and Subsection | S12 R6W |
| Hydrologic Unit Code | 05040004 |
| Site Visit | 10/14/13 |
| National Wetland Inventory Map | PUBGx |
| Ohio Wetland Inventory Map | — |
| Soil Survey | BhF |
| Delineation report/map | Yes |

| | |
|---|---|
| **Name of Wetland:** X | |
| **Wetland Size (acres, hectares):** | 0.15ac |

**Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.**

Please see attached maps

**Comments, Narrative Discussion, Justification of Category Changes:**

-depressional wetland fringing a mine pond
-sparsely vegetated w/ disturbed soils
& lots of downed trees

| | | | |
|---|---|---|---|
| **Final score :** | 36.5 | **Category:** | Mod 2 |

# Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| # | Steps in properly establishing scoring boundaries | done? | not applicable |
|---|---|---|---|
| **Step 1** | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc. | ✓ | |
| **Step 2** | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | ✓ | |
| **Step 3** | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary. | ✓ | |
| **Step 4** | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes. | ✓ | |
| **Step 5** | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately. | | ✓ |
| **Step 6** | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications. | | ✓ |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

# Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| # | Question | Circle one | |
|---|---|---|---|
| 1 | **Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000). | YES<br>Wetland should be evaluated for possible Category 3 status<br>Go to Question 2 | NO<br>Go to Question 2 |
| 2 | **Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species? | YES<br>Wetland is a Category 3 wetland.<br>Go to Question 3 | NO<br>Go to Question 3 |
| 3 | **Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 4 | NO<br>Go to Question 4 |
| 4 | **Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 5 | NO<br>Go to Question 5 |
| 5 | **Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation? | YES<br>Wetland is a Category 1 wetland<br>Go to Question 6 | NO<br>Go to Question 6 |
| 6 | **Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 7 | NO<br>Go to Question 7 |
| 7 | **Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 8a | NO<br>Go to Question 8a |
| 8a | **"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs? | YES<br>Wetland is a Category 3 wetland.<br>Go to Question 8b | NO<br>Go to Question 8b |

| | | | |
|---|---|---|---|
| 8b | **Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh? | YES<br><br>Wetland should be evaluated for possible Category 3 status.<br><br>Go to Question 9a | NO<br><br>Go to Question 9a |
| 9a | **Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish? | YES<br><br>Go to Question 9b | NO<br><br>Go to Question 10 |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 9c |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation. | YES<br><br>Go to Question 9d | NO<br><br>Go to Question 10 |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 10 | NO<br><br>Go to Question 9e |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 10 |
| 10 | **Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 11 | NO<br><br>Go to Question 11 |
| 11 | **Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Complete Quantitative Rating | NO<br><br>Complete Quantitative Rating |

**Table 1. Characteristic plant species.**

| invasive/exotic spp | fen species | bog species | 0ak Opening species | wet prairie species |
|---|---|---|---|---|
| *Lythrum salicaria* | *Zygadenus elegans var. glaucus* | *Calla palustris* | *Carex cryptolepis* | *Calamagrostis canadensis* |
| *Myriophyllum spicatum* | *Cacalia plantaginea* | *Carex atlantica var. capillacea* | *Carex lasiocarpa* | *Calamogrostis stricta* |
| *Najas minor* | *Carex flava* | *Carex echinata* | *Carex stricta* | *Carex atherodes* |
| *Phalaris arundinacea* | *Carex sterilis* | *Carex oligosperma* | *Cladium mariscoides* | *Carex buxbaumii* |
| *Phragmites australis* | *Carex stricta* | *Carex trisperma* | *Calamagrostis stricta* | *Carex pellita* |
| *Potamogeton crispus* | *Deschampsia caespitosa* | *Chamaedaphne calyculata* | *Calamagrostis canadensis* | *Carex sartwellii* |
| *Ranunculus ficaria* | *Eleocharis rostellata* | *Decodon verticillatus* | *Quercus palustris* | *Gentiana andrewsii* |
| *Rhamnus frangula* | *Eriophorum viridicarinatum* | *Eriophorum virginicum* | | *Helianthus grosseserratus* |
| *Typha angustifolia* | *Gentianopsis spp.* | *Larix laricina* | | *Liatris spicata* |
| *Typha xglauca* | *Lobelia kalmii* | *Nemopanthus mucronatus* | | *Lysimachia quadriflora* |
| | *Parnassia glauca* | *Schechzeria palustris* | | *Lythrum alatum* |
| | *Potentilla fruticosa* | *Sphagnum spp.* | | *Pycnanthemum virginianum* |
| | *Rhamnus alnifolia* | *Vaccinium macrocarpon* | | *Silphium terebinthinaceum* |
| | *Rhynchospora capillacea* | *Vaccinium corymbosum* | | *Sorghastrum nutans* |
| | *Salix candida* | *Vaccinium oxycoccos* | | *Spartina pectinata* |
| | *Salix myricoides* | *Woodwardia virginica* | | *Solidago riddellii* |
| | *Salix serissima* | *Xyris difformis* | | |
| | *Solidago ohioensis* | | | |
| | *Tofieldia glutinosa* | | | |
| | *Triglochin maritimum* | | | |
| | *Triglochin palustre* | | | |

**End of Narrative Rating. Begin Quantitative Rating on next page.**

| Site: AEP 5PTS Wetland X | Rater(s): LS | Date: 10/15/13 |
|---|---|---|

| 1 | 1 |
|---|---|
| max 6 pts. | subtotal |

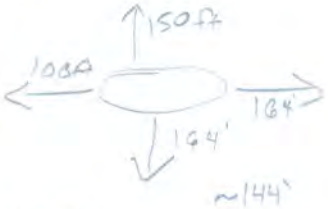
## Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [x] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt) 0.15 ac
- [ ] <0.1 acres (0.04ha) (0 pts)

| 9 | 10 |
|---|---|
| max 14 pts. | subtotal |

## Metric 2. Upland buffers and surrounding land use.




2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [x] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

4

2b. Intensity of surrounding land use. Select one or double check and average.

- [x] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

5

| 12 | 22 |
|---|---|
| max 30 pts. | subtotal |

## Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

1

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

0

3c. Maximum water depth. Select only one and assign score.

- [x] >0.7 (27.6in) (3) — trim lines & water marks
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

3

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

5

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other Mining

| 7.5 | 29.5 |
|---|---|
| max 20 pts. | subtotal |

## Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

2.5

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

2

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

3

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging mining
- [ ] farming
- [ ] nutrient enrichment

| 29.5 |
|---|
| subtotal this page |

last revised 1 February 2001 jjm

| Site: AEP 5PTS Wetland X | Rater(s): LS | Date: 10/15/13 |
|---|---|---|

29.5
subtotal first page

## Metric 5. Special Wetlands.

| 0 | 29.5 |
|---|---|
| max 10 pts. | subtotal |

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

## Metric 6. Plant communities, interspersion, microtopography.

| 7 | 36.5 |
|---|---|
| max 20 pts. | subtotal |

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [1] Mudflats
- [0] Open water (adjacent)
- [ ] Other_____

2

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [✓] Low (1)
- [ ] None (0)

1

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [✓] Absent (1)

1

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [2] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [1] Amphibian breeding pools

3

**Vegetation Community Cover Scale**

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

**Narrative Description of Vegetation Quality**

| | |
|---|---|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

**Mudflat and Open Water Class Quality**

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

**Microtopography Cover Scale**

| | |
|---|---|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

Mod II

36.5

**End of Quantitative Rating. Complete Categorization Worksheets.**

# ORAM Summary Worksheet

| | | circle answer or insert score | Result |
|---|---|---|---|
| Narrative Rating | Question 1 Critical Habitat | YES NO | If yes, Category 3. |
| | Question 2. Threatened or Endangered Species | YES NO | If yes, Category 3. |
| | Question 3. High Quality Natural Wetland | YES NO | If yes, Category 3. |
| | Question 4. Significant bird habitat | YES NO | If yes, Category 3. |
| | Question 5. Category 1 Wetlands | YES NO | If yes, Category 1. |
| | Question 6. Bogs | YES NO | If yes, Category 3. |
| | Question 7. Fens | YES NO | If yes, Category 3. |
| | Question 8a. Old Growth Forest | YES NO | If yes, Category 3. |
| | Question 8b. Mature Forested Wetland | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9b. Lake Erie Wetlands - Restricted | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9d. Lake Erie Wetlands – Unrestricted with native plants | YES NO | If yes, Category 3 |
| | Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 10. Oak Openings | YES NO | If yes, Category 3 |
| | Question 11. Relict Wet Prairies | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| Quantitative Rating | Metric 1. Size | 1 | |
| | Metric 2. Buffers and surrounding land use | 9 | |
| | Metric 3. Hydrology | 12 | |
| | Metric 4. Habitat | 7.5 | |
| | Metric 5. Special Wetland Communities | 0 | |
| | Metric 6. Plant communities, interspersion, microtopography | 7 | |
| | TOTAL SCORE | 36.5 | Category based on score breakpoints Mod 2 |

**Complete Wetland Categorization Worksheet.**

# Wetland Categorization Worksheet

| Choices | Circle one | | Evaluation of Categorization Result of ORAM |
|---|---|---|---|
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10 | YES<br><br>Wetland is categorized as a Category 3 wetland | NO | Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM |
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11 | YES<br><br>Wetland should be evaluated for possible Category 3 status | NO | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category. |
| Did you answer "Yes" to<br><br>Narrative Rating No. 5 | YES<br><br>Wetland is categorized as a Category 1 wetland | NO | Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland? | YES<br><br>Wetland is assigned to the appropriate category based on the scoring range | NO | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score. |
| Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands? | YES<br><br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria | NO | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C). |
| Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br><br>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br><br>Wetland is assigned to category as determined by the ORAM. | A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided. |

**Final Category**

| Choose one | Category 1 | Category 2 | Category 3 |
|---|---|---|---|

## End of Ohio Rapid Assessment Method for Wetlands.

# Background Information

| | |
|---|---|
| **Name:** | MAD Scientist & Associates (MAD |
| **Date:** | 10/15/13 |
| **Affiliation:** | MAD |
| **Address:** | 253 N. State St. Suite 101 Westerville, OH 43081 |
| **Phone Number:** | (614) 818-9156 |
| **e-mail address:** | luke@madscientistassociates.net |
| **Name of Wetland:** | Y |
| **Vegetation Communit(ies):** | emergent, scrub-shrub |
| **HGM Class(es):** | Depressional |

**Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.**

See attached Map

| | |
|---|---|
| Lat/Long or UTM Coordinate | 40.190072 -81.848740 |
| USGS Quad Name | Wills Creek |
| County | Coshocton |
| Township | T4N |
| Section and Subsection | S12 R6W |
| Hydrologic Unit Code | 05040004 |
| Site Visit | 10/14/13 |
| National Wetland Inventory Map | PUBGx |
| Ohio Wetland Inventory Map | — |
| Soil Survey | BhF |
| Delineation report/map | Yes |

| | |
|---|---|
| **Name of Wetland:** Y | |
| **Wetland Size (acres, hectares):** | 0.02 |

**Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.**

See attached map

**Comments, Narrative Discussion, Justification of Category Changes:**

- small wetland fringing a mine pond
- disturbed soils, recovering vegetation

| | |
|---|---|
| **Final score :** 35 | **Category:** Mod 2 |

# Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| # | Steps in properly establishing scoring boundaries | done? | not applicable |
|---|---|---|---|
| **Step 1** | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc. | ✓ | |
| **Step 2** | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | ✓ | |
| **Step 3** | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary. | ✓ | |
| **Step 4** | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes. | ✓ | |
| **Step 5** | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately. | | ✓ |
| **Step 6** | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications. | | ✓ |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

# Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| # | Question | Circle one | |
|---|---|---|---|
| 1 | **Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000). | YES<br>Wetland should be evaluated for possible Category 3 status<br>Go to Question 2 | NO<br>Go to Question 2 |
| 2 | **Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species? | YES<br>Wetland is a Category 3 wetland.<br>Go to Question 3 | NO<br>Go to Question 3 |
| 3 | **Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 4 | NO<br>Go to Question 4 |
| 4 | **Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 5 | NO<br>Go to Question 5 |
| 5 | **Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation? | YES<br>Wetland is a Category 1 wetland<br>Go to Question 6 | NO<br>Go to Question 6 |
| 6 | **Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 7 | NO<br>Go to Question 7 |
| 7 | **Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%? | YES<br>Wetland is a Category 3 wetland<br>Go to Question 8a | NO<br>Go to Question 8a |
| 8a | **"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs? | YES<br>Wetland is a Category 3 wetland.<br>Go to Question 8b | NO<br>Go to Question 8b |

| | | | |
|---|---|---|---|
| 8b | **Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh? | YES<br><br>Wetland should be evaluated for possible Category 3 status.<br><br>Go to Question 9a | NO<br><br>Go to Question 9a |
| 9a | **Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish? | YES<br><br>Go to Question 9b | NO<br><br>Go to Question 10 |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 9c |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation. | YES<br><br>Go to Question 9d | NO<br><br>Go to Question 10 |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 10 | NO<br><br>Go to Question 9e |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 10 |
| 10 | **Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 11 | NO<br><br>Go to Question 11 |
| 11 | **Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Complete Quantitative Rating | NO<br><br>Complete Quantitative Rating |

**Table 1. Characteristic plant species.**

| invasive/exotic spp | fen species | bog species | 0ak Opening species | wet prairie species |
|---|---|---|---|---|
| *Lythrum salicaria* | *Zygadenus elegans var. glaucus* | *Calla palustris* | *Carex cryptolepis* | *Calamagrostis canadensis* |
| *Myriophyllum spicatum* | *Cacalia plantaginea* | *Carex atlantica var. capillacea* | *Carex lasiocarpa* | *Calamogrostis stricta* |
| *Najas minor* | *Carex flava* | *Carex echinata* | *Carex stricta* | *Carex atherodes* |
| *Phalaris arundinacea* | *Carex sterilis* | *Carex oligosperma* | *Cladium mariscoides* | *Carex buxbaumii* |
| *Phragmites australis* | *Carex stricta* | *Carex trisperma* | *Calamagrostis stricta* | *Carex pellita* |
| *Potamogeton crispus* | *Deschampsia caespitosa* | *Chamaedaphne calyculata* | *Calamagrostis canadensis* | *Carex sartwellii* |
| *Ranunculus ficaria* | *Eleocharis rostellata* | *Decodon verticillatus* | *Quercus palustris* | *Gentiana andrewsii* |
| *Rhamnus frangula* | *Eriophorum viridicarinatum* | *Eriophorum virginicum* | | *Helianthus grosseserratus* |
| *Typha angustifolia* | *Gentianopsis spp.* | *Larix laricina* | | *Liatris spicata* |
| *Typha xglauca* | *Lobelia kalmii* | *Nemopanthus mucronatus* | | *Lysimachia quadriflora* |
| | *Parnassia glauca* | *Schechzeria palustris* | | *Lythrum alatum* |
| | *Potentilla fruticosa* | *Sphagnum spp.* | | *Pycnanthemum virginianum* |
| | *Rhamnus alnifolia* | *Vaccinium macrocarpon* | | *Silphium terebinthinaceum* |
| | *Rhynchospora capillacea* | *Vaccinium corymbosum* | | *Sorghastrum nutans* |
| | *Salix candida* | *Vaccinium oxycoccos* | | *Spartina pectinata* |
| | *Salix myricoides* | *Woodwardia virginica* | | *Solidago riddellii* |
| | *Salix serissima* | *Xyris difformis* | | |
| | *Solidago ohioensis* | | | |
| | *Tofieldia glutinosa* | | | |
| | *Triglochin maritimum* | | | |
| | *Triglochin palustre* | | | |

**End of Narrative Rating. Begin Quantitative Rating on next page.**

| Site: Wetland Y | Rater(s): LS | Date: 10/15/13 |
|---|---|---|

## Metric 1. Wetland Area (size).

| max 6 pts. | subtotal |
|---|---|
| 0 | 0 |

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [x] <0.1 acres (0.04ha) (0 pts) 0.02ac

## Metric 2. Upland buffers and surrounding land use.

| max 14 pts. | subtotal |
|---|---|
| 12 | 12 |

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

7

- [x] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

5

- [x] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

## Metric 3. Hydrology.

| max 30 pts. | subtotal |
|---|---|
| 10.5 | 22.5 |

3a. Sources of Water. Score all that apply.

1

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

0

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

2

- [ ] >0.7 (27.6in) (3)
- [x] 0.4 to 0.7m (15.7 to 27.6in) (2) moss & trim lines 2.5
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [x] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

5

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other mining

## Metric 4. Habitat Alteration and Development.

| max 20 pts. | subtotal |
|---|---|
| 7.5 | 30 |

4a. Substrate disturbance. Score one or double check and average.

2.5

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

2

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

3

- [ ] None or none apparent (9)
- [x] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment
- mining

30

subtotal this page

last revised 1 February 2001 jjm

| Site: AEP 5PTS Wetland Y | Rater(s): LS | Date: 10/15/13 |
|---|---|---|

30
subtotal first page

## Metric 5. Special Wetlands.

| 0 | 30 |
|---|---|
| max 10 pts. | subtotal |

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

## Metric 6. Plant communities, interspersion, microtopography.

| 5 | 35 |
|---|---|
| max 20 pts. | subtotal |

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [1] Shrub
- [0] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

2

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [✓] Low (1)
- [ ] None (0)

1

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [✓] Absent (1)

1

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

1

**Vegetation Community Cover Scale**

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

**Narrative Description of Vegetation Quality**

| | |
|---|---|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

**Mudflat and Open Water Class Quality**

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

**Microtopography Cover Scale**

| | |
|---|---|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

35 Mod R

**End of Quantitative Rating. Complete Categorization Worksheets.**

# ORAM Summary Worksheet

| | | circle answer or insert score | Result |
|---|---|---|---|
| Narrative Rating | Question 1 Critical Habitat | YES NO | If yes, Category 3. |
| | Question 2. Threatened or Endangered Species | YES NO | If yes, Category 3. |
| | Question 3. High Quality Natural Wetland | YES NO | If yes, Category 3. |
| | Question 4. Significant bird habitat | YES NO | If yes, Category 3. |
| | Question 5. Category 1 Wetlands | YES NO | If yes, Category 1. |
| | Question 6. Bogs | YES NO | If yes, Category 3. |
| | Question 7. Fens | YES NO | If yes, Category 3. |
| | Question 8a. Old Growth Forest | YES NO | If yes, Category 3. |
| | Question 8b. Mature Forested Wetland | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9b. Lake Erie Wetlands - Restricted | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9d. Lake Erie Wetlands – Unrestricted with native plants | YES NO | If yes, Category 3 |
| | Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 10. Oak Openings | YES NO | If yes, Category 3 |
| | Question 11. Relict Wet Prairies | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| Quantitative Rating | Metric 1. Size | 0 | |
| | Metric 2. Buffers and surrounding land use | 12 | |
| | Metric 3. Hydrology | 10.5 | |
| | Metric 4. Habitat | 7.5 | |
| | Metric 5. Special Wetland Communities | 0 | |
| | Metric 6. Plant communities, interspersion, microtopography | 5 | |
| | TOTAL SCORE | 35 | Category based on score breakpoints Mod 2 |

**Complete Wetland Categorization Worksheet.**

# Wetland Categorization Worksheet

| Choices | Circle one | | Evaluation of Categorization Result of ORAM |
|---|---|---|---|
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10 | YES<br><br>Wetland is categorized as a Category 3 wetland | NO | Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM |
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11 | YES<br><br>Wetland should be evaluated for possible Category 3 status | NO | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category. |
| Did you answer "Yes" to<br><br>Narrative Rating No. 5 | YES<br><br>Wetland is categorized as a Category 1 wetland | NO | Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland? | YES<br><br>Wetland is assigned to the appropriate category based on the scoring range | NO | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score. |
| Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands? | YES<br><br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria | NO | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C). |
| Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br><br>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br><br>Wetland is assigned to category as determined by the ORAM. | A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided. |

**Final Category**

| Choose one | Category 1 | Category 2 | Category 3 |
|---|---|---|---|

## End of Ohio Rapid Assessment Method for Wetlands.

# Background Information

| | |
|---|---|
| **Name:** MAD Scientist & Associates (MAD) | |
| **Date:** 10/15/13 | |
| **Affiliation:** MAD | |
| **Address:** 253 N. State. St, Suite 101 Westerville, OH 43081 | |
| **Phone Number:** (614) 818-9156 | |
| **e-mail address:** luke@madscientistassociates.net | |
| **Name of Wetland:** Z | |
| **Vegetation Communit(ies):** emergent, scrub-shrub | |
| **HGM Class(es):** | |
| **Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.** See attached map | |
| Lat/Long or UTM Coordinate | 40.190094 -81.846349 |
| USGS Quad Name | Wills Creek |
| County | Coshocton |
| Township | T4N |
| Section and Subsection | S12 R6W |
| Hydrologic Unit Code | 05040004 |
| Site Visit | 10/14/13 |
| National Wetland Inventory Map | PUBGx |
| Ohio Wetland Inventory Map | — |
| Soil Survey | BhF |
| Delineation report/map | Yes |

| | |
|---|---|
| **Name of Wetland:** Z | |
| **Wetland Size (acres, hectares):** | 0.09 ac |

**Sketch:** Include north arrow, relationship with other surface waters, vegetation zones, etc.

See attached map

**Comments, Narrative Discussion, Justification of Category Changes:**

- 4-5 foot wide fringe of wetland around mine pond
- tadpoles & frogs observed in the mine pond

| | |
|---|---|
| **Final score :** 37 | **Category:** Mod 2 |

# Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| # | Steps in properly establishing scoring boundaries | done? | not applicable |
|---|---|---|---|
| **Step 1** | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc. | ✓ | |
| **Step 2** | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | ✓ | |
| **Step 3** | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary. | ✓ | |
| **Step 4** | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes. | ✓ | |
| **Step 5** | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately. | | ✓ |
| **Step 6** | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications. | | ✓ |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

# Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| # | Question | Circle one | |
|---|---|---|---|
| 1 | **Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | NO<br><br>Go to Question 2 |
| 2 | **Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species? | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 3 | NO<br><br>Go to Question 3 |
| 3 | **Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 4 | NO<br><br>Go to Question 4 |
| 4 | **Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 5 | NO<br><br>Go to Question 5 |
| 5 | **Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation? | YES<br><br>Wetland is a Category 1 wetland<br><br>Go to Question 6 | NO<br><br>Go to Question 6 |
| 6 | **Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 7 | NO<br><br>Go to Question 7 |
| 7 | **Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 8a | NO<br><br>Go to Question 8a |
| 8a | **"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs? | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 8b | NO<br><br>Go to Question 8b |

| | | | |
|---|---|---|---|
| 8b | **Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh? | YES<br><br>Wetland should be evaluated for possible Category 3 status.<br><br>Go to Question 9a | NO<br><br>Go to Question 9a |
| 9a | **Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish? | YES<br><br>Go to Question 9b | NO<br><br>Go to Question 10 |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 9c |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation. | YES<br><br>Go to Question 9d | NO<br><br>Go to Question 10 |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present? | YES<br><br>Wetland is a Category 3 wetland<br><br>Go to Question 10 | NO<br><br>Go to Question 9e |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities? | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 10 | NO<br><br>Go to Question 10 |
| 10 | **Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland.<br><br>Go to Question 11 | NO<br><br>Go to Question 11 |
| 11 | **Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Complete Quantitative Rating | NO<br><br>Complete Quantitative Rating |

**Table 1. Characteristic plant species.**

| invasive/exotic spp | fen species | bog species | 0ak Opening species | wet prairie species |
|---|---|---|---|---|
| *Lythrum salicaria* | *Zygadenus elegans var. glaucus* | *Calla palustris* | *Carex cryptolepis* | *Calamagrostis canadensis* |
| *Myriophyllum spicatum* | *Cacalia plantaginea* | *Carex atlantica var. capillacea* | *Carex lasiocarpa* | *Calamogrostis stricta* |
| *Najas minor* | *Carex flava* | *Carex echinata* | *Carex stricta* | *Carex atherodes* |
| *Phalaris arundinacea* | *Carex sterilis* | *Carex oligosperma* | *Cladium mariscoides* | *Carex buxbaumii* |
| *Phragmites australis* | *Carex stricta* | *Carex trisperma* | *Calamagrostis stricta* | *Carex pellita* |
| *Potamogeton crispus* | *Deschampsia caespitosa* | *Chamaedaphne calyculata* | *Calamagrostis canadensis* | *Carex sartwellii* |
| *Ranunculus ficaria* | *Eleocharis rostellata* | *Decodon verticillatus* | *Quercus palustris* | *Gentiana andrewsii* |
| *Rhamnus frangula* | *Eriophorum viridicarinatum* | *Eriophorum virginicum* | | *Helianthus grosseserratus* |
| *Typha angustifolia* | *Gentianopsis spp.* | *Larix laricina* | | *Liatris spicata* |
| *Typha xglauca* | *Lobelia kalmii* | *Nemopanthus mucronatus* | | *Lysimachia quadriflora* |
| | *Parnassia glauca* | *Schechzeria palustris* | | *Lythrum alatum* |
| | *Potentilla fruticosa* | *Sphagnum spp.* | | *Pycnanthemum virginianum* |
| | *Rhamnus alnifolia* | *Vaccinium macrocarpon* | | *Silphium terebinthinaceum* |
| | *Rhynchospora capillacea* | *Vaccinium corymbosum* | | *Sorghastrum nutans* |
| | *Salix candida* | *Vaccinium oxycoccos* | | *Spartina pectinata* |
| | *Salix myricoides* | *Woodwardia virginica* | | *Solidago riddellii* |
| | *Salix serissima* | *Xyris difformis* | | |
| | *Solidago ohioensis* | | | |
| | *Tofieldia glutinosa* | | | |
| | *Triglochin maritimum* | | | |
| | *Triglochin palustre* | | | |

**End of Narrative Rating. Begin Quantitative Rating on next page.**

| Site: AEP 5PTS Wetland Z | Rater(s): LS | Date: 10/15/13 |
|---|---|---|

## Metric 1. Wetland Area (size).

| max 6 pts. | subtotal |
|---|---|
| 0 | 0 |

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [x] <0.1 acres (0.04ha) (0 pts) 0.09ac

## Metric 2. Upland buffers and surrounding land use.

| max 14 pts. | subtotal |
|---|---|
| 12 | 12 |

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

7

- [x] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

5

- [x] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

## Metric 3. Hydrology.

| max 30 pts. | subtotal |
|---|---|
| 10.5 | 22.5 |

3a. Sources of Water. Score all that apply.

1

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [ ] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

0

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

2

- [ ] >0.7 (27.6in) (3)
- [x] 0.4 to 0.7m (15.7 to 27.6in) (2) moss trim lines & sediment deposits
- [ ] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

2.5

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [x] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

5

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other Mining

## Metric 4. Habitat Alteration and Development.

| max 20 pts. | subtotal |
|---|---|
| 8.5 | 31 |

4a. Substrate disturbance. Score one or double check and average.

2.5

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

3

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

3

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [x] grazing
- [x] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [x] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

Mining

31

subtotal this page

last revised 1 February 2001 jjm

| Site: AEP 5PTS Wetland Z | Rater(s): LS | Date: 10/15/13 |
|---|---|---|

31
subtotal first page

| 0 | 31 |
|---|---|
| max 10 pts. | subtotal |

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

| 6 | 37 |
|---|---|
| max 20 pts. | subtotal |

## Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [1] Shrub
- [ ] Forest
- [ ] Mudflats
- [0] Open water
- [ ] Other_____

2

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [✓] Low (1)
- [ ] None (0)

1

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [✓] Absent (1)

1

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [ ] Standing dead >25cm (10in) dbh
- [1] Amphibian breeding pools

2

**Vegetation Community Cover Scale**

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

**Narrative Description of Vegetation Quality**

| | |
|---|---|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

**Mudflat and Open Water Class Quality**

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

**Microtopography Cover Scale**

| | |
|---|---|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

37

**End of Quantitative Rating. Complete Categorization Worksheets.**

# ORAM Summary Worksheet

| | | circle answer or insert score | Result |
|---|---|---|---|
| Narrative Rating | Question 1 Critical Habitat | YES NO | If yes, Category 3. |
| | Question 2. Threatened or Endangered Species | YES NO | If yes, Category 3. |
| | Question 3. High Quality Natural Wetland | YES NO | If yes, Category 3. |
| | Question 4. Significant bird habitat | YES NO | If yes, Category 3. |
| | Question 5. Category 1 Wetlands | YES NO | If yes, Category 1. |
| | Question 6. Bogs | YES NO | If yes, Category 3. |
| | Question 7. Fens | YES NO | If yes, Category 3. |
| | Question 8a. Old Growth Forest | YES NO | If yes, Category 3. |
| | Question 8b. Mature Forested Wetland | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9b. Lake Erie Wetlands - Restricted | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 9d. Lake Erie Wetlands – Unrestricted with native plants | YES NO | If yes, Category 3 |
| | Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| | Question 10. Oak Openings | YES NO | If yes, Category 3 |
| | Question 11. Relict Wet Prairies | YES NO | If yes, evaluate for Category 3; may also be 1 or 2. |
| Quantitative Rating | Metric 1. Size | 0 | |
| | Metric 2. Buffers and surrounding land use | 12 | |
| | Metric 3. Hydrology | 10.5 | |
| | Metric 4. Habitat | 8.5 | |
| | Metric 5. Special Wetland Communities | 0 | |
| | Metric 6. Plant communities, interspersion, microtopography | 6 | |
| | TOTAL SCORE | 37 | Category based on score breakpoints Mod 2 |

**Complete Wetland Categorization Worksheet**.

# Wetland Categorization Worksheet

| Choices | Circle one | | Evaluation of Categorization Result of ORAM |
|---|---|---|---|
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10 | YES<br><br>Wetland is categorized as a Category 3 wetland | NO | Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM |
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11 | YES<br><br>Wetland should be evaluated for possible Category 3 status | NO | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category. |
| Did you answer "Yes" to<br><br>Narrative Rating No. 5 | YES<br><br>Wetland is categorized as a Category 1 wetland | NO | Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland? | YES<br><br>Wetland is assigned to the appropriate category based on the scoring range | NO | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score. |
| Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands? | YES<br><br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria | NO | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C). |
| Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br><br>Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br><br>Wetland is assigned to category as determined by the ORAM. | A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided. |

**Final Category**

| Choose one | Category 1 | Category 2 | Category 3 |
|---|---|---|---|

## End of Ohio Rapid Assessment Method for Wetlands.

but persons using these scoring ranges and breakpoints should keep in mind that they have been calibrated based on biological data obtained from predominately depressional wetlands located in the Eastern Corn Belt Plains Ecoregion. Thus, they should be applied with caution to wetlands located in other ecoregions of the state and to wetlands of other vegetation types and other landscape settings. Ohio EPA has found significant ecoregional differences in streams, and this may also be the case for wetlands (Ohio EPA 1988a, 1988b, 1989). Ohio EPA will be studying wetlands in the Erie-Ontario Lake Plains (including the glaciated Allegheny Plateau) in 2001 and 2002, and in the Huron-Erie Lake Plains and Western Allegheny Plateau Ecoregions in subsequent years.

**Table 2. Interim scoring breakpoints for wetland regulatory categories for ORAM and VIBI scores.**

| category | ORAM v. 5.0 score | VIBI score |
|---|---|---|
| 1 | 0 - 29.9 | 0 - 21 |
| 1 or 2 gray zone | 30 - 34.9 | ---- |
| modified 2 | 35 - 44.9 | 22 - 44 |
| 2 | 45 - 59.9 | 45 - 66 |
| 2 or 3 | 60 - 64.9 | ---- |
| 3 | 65 - 100 | 67 - 100 |

# APPENDIX D

## Primary Headwater Habitat Evaluation (HHEI)
## Field Data Forms

# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 14

SITE NAME/LOCATION Stream S1 – AEP 5 Points Mine Reclamation

SITE NUMBER 1 RIVER BASIN _____ DRAINAGE AREA (mi²) 0.0015

LENGTH OF STREAM REACH (ft) 200 ft LAT. 40.192815 LONG. -81.843623 RIVER CODE _____ RIVER MILE _____

DATE 5/3/13 SCORER LS COMMENTS headwater drains from wetland B/C complex

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL MODIFICATIONS:** ☒ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☒ ☐ | SILT [3 pt] | 40 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | | ☐ ☒ | LEAF PACK/WOODY DEBRIS [3 pts] | 45 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | 15 |
| ☐ ☐ | COBBLE (65-256 mm) [12 pts] | | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☐ | GRAVEL (2-64 mm) [9 pts] | | ☐ ☐ | MUCK [0 pts] | |
| ☐ ☐ | SAND (<2 mm) [6 pts] | | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 6

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 3

**HHEI Metric Points**

**Substrate Max = 40** 9

**A + B**

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (centimeters):** 0

**Pool Depth Max = 30** 0

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ **AVERAGE BANKFULL WIDTH (meters)** 0.8

**Bankfull Width Max=30** 5

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH (Per Bank) L | R | | FLOODPLAIN QUALITY (Most Predominant per Bank) L | R | | L | R | |
|---|---|---|---|---|---|---|---|---|
| ☒ | ☒ | Wide >10m | ☒ | ☒ | Mature Forest, Wetland | ☐ | ☐ | Conservation Tillage |
| ☐ | ☐ | Moderate 5-10m | ☐ | ☐ | Immature Forest, Shrub or Old Field | ☐ | ☐ | Urban or Industrial |
| ☐ | ☐ | Narrow <5m | ☐ | ☐ | Residential, Park, New Field | ☐ | ☐ | Open Pasture, Row Crop |
| ☐ | ☐ | None | ☐ | ☐ | Fenced Pasture | ☐ | ☐ | Mining or Construction |

COMMENTS _____

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☒ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

| | | | |
|---|---|---|---|
| ☐ None | ☐ 1.0 | ☐ 2.0 | ☐ 3.0 |
| ☐ 0.5 | ☐ 1.5 | ☐ 2.5 | ☒ >3 |

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☒ Severe (10 ft/100 ft)



June 20, 2008 Revision

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coshocton Township / City: Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/31/13 Quantity: 0.20 in

Photograph Information: DSCN4135 - DSCN4140

Elevated Turbidity? (Y/N): N Canopy (% open): 5

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

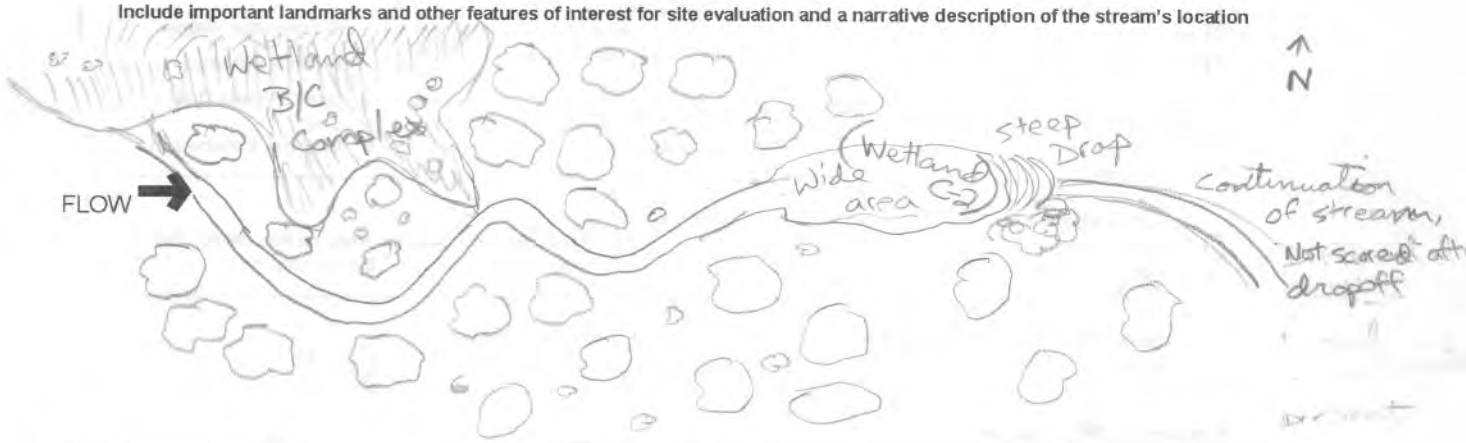
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: Terrestrial earthworms in moist channel under leaves

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**






community around stream includes: spicebush, multiflora rose, Am. beech, cinnamon fern, Tulip poplar, mayapple

# Ohio EPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 59

SITE NAME/LOCATION Stream 58 (HHEI 2 of GPS) AEP 5 Points

SITE NUMBER 58 RIVER BASIN _____ DRAINAGE AREA (mi²) 0.73

LENGTH OF STREAM REACH (ft) 200 LAT. 40.192533 LONG. -81.842706 RIVER CODE _____ RIVER MILE _____

DATE 6/3/13 SCORER LS COMMENTS _____

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL** ☒ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

**MODIFICATIONS:** Potentially was historically altered during road/mining activity, evidence is minimal

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☒ ☐ | SILT [3 pt] | 45 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | | ☐ ☐ | LEAF PACK/WOODY DEBRIS [3 pts] | 8 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | 2 |
| ☐ ☐ | COBBLE (65-256 mm) [12 pts] | | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☐ | GRAVEL (2-64 mm) [9 pts] | 10 | ☐ ☐ | MUCK [0 pts] | |
| ☐ ☐ | SAND (<2 mm) [6 pts] | 35 | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 9

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 5

**HHEI Metric Points**

**Substrate Max = 40** 14

**A + B**

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☒ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

**COMMENTS** _____ **MAXIMUM POOL DEPTH (centimeters):** 26

**Pool Depth Max = 30** 30

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☒ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

**COMMENTS** _____ **AVERAGE BANKFULL WIDTH (meters)** 1.2

**Bankfull Width Max=30** 15

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH L | R | (Per Bank) | FLOODPLAIN QUALITY L | R | (Most Predominant per Bank) | L | R | |
|---|---|---|---|---|---|---|---|---|
| ☐ | ☒ | Wide >10m | ☐ | ☒ | Mature Forest, Wetland | ☐ | ☐ | Conservation Tillage |
| ☒ | ☐ | Moderate 5-10m | ☒ | ☐ | Immature Forest, Shrub or Old Field | ☐ | ☐ | Urban or Industrial |
| ☐ | ☐ | Narrow <5m | ☐ | ☐ | Residential, Park, New Field | ☐ | ☐ | Open Pasture, Row Crop |
| ☐ | ☐ | None | ☐ | ☐ | Fenced Pasture | ☐ | ☐ | Mining or Construction |

COMMENTS L bank floodplain borders Hwy 83 + roadside easement

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

- ☒ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☒ 3.0
- ☐ >3

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☒ Moderate to Severe ☐ Severe (10 ft/100 ft)



June 20, 2008 Revision

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coshocton Township / City: Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/31/13 Quantity: 0.20in

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 7%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: Lots of silt has sedimented in streambed, possibly road runoff

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

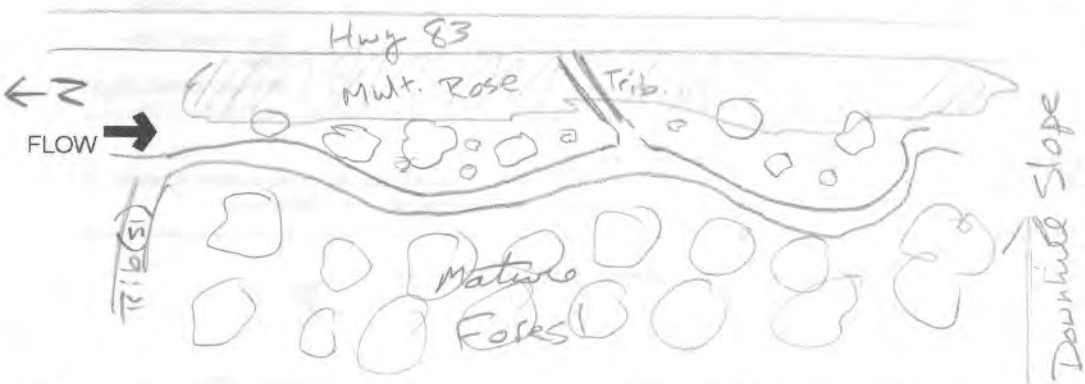
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: Minnows observed upstream of sample reach

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**



# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 20

SITE NAME/LOCATION Stream 3

AEP 5 points SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) 0.0573

LENGTH OF STREAM REACH (ft) _____ LAT. 40.193684 LONG. -81.84334 RIVER CODE _____ RIVER MILE _____

DATE 6/4/13 SCORER LS COMMENTS Stream channel surrounded by mult Rose

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL MODIFICATIONS:** ☒ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☐ ☒ | SILT [3 pt] | 30 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | | ☐ ☐ | LEAF PACK/WOODY DEBRIS [3 pts] | 15 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | 10 |
| ☐ ☐ | COBBLE (65-256 mm) [12 pts] | 3 | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☐ | GRAVEL (2-64 mm) [9 pts] | 7 | ☐ ☐ | MUCK [0 pts] | |
| ☒ ☐ | SAND (<2 mm) [6 pts] | 35 | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 3 (A) 9

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:**

(B) 6 **TOTAL NUMBER OF SUBSTRATE TYPES:**

**HHEI Metric Points**

**Substrate Max = 40** 15

**A + B**

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

**COMMENTS** _____ **MAXIMUM POOL DEPTH (centimeters):** 0

**Pool Depth Max = 30** 0

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]

**COMMENTS** _____ **AVERAGE BANKFULL WIDTH (meters)** 0.45

**Bankfull Width Max=30** 5

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH L | R | (Per Bank) | FLOODPLAIN QUALITY L | R | (Most Predominant per Bank) | L | R | |
|---|---|---|---|---|---|---|---|---|
| ☒ | ☒ | Wide >10m | ☒ | ☐ | Mature Forest, Wetland | ☐ | ☐ | Conservation Tillage |
| ☐ | ☐ | Moderate 5-10m | ☐ | ☒ | Immature Forest, Shrub or Old Field | ☐ | ☐ | Urban or Industrial |
| ☐ | ☐ | Narrow <5m | ☐ | ☐ | Residential, Park, New Field | ☐ | ☐ | Open Pasture, Row Crop |
| ☐ | ☐ | None | ☐ | ☐ | Fenced Pasture | ☐ | ☐ | Mining or Construction |

COMMENTS Riparian zone is multiflora rose & forest

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☒ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

| | | | |
|---|---|---|---|
| ☐ None | ☒ 1.0 | ☐ 2.0 | ☐ 3.0 |
| ☐ 0.5 | ☐ 1.5 | ☐ 2.5 | ☐ >3 |

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☒ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coschocton Township / City: Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/31/13 Quantity: 0.20in

Photograph Information: DSCN 4083 - DSCN4092

Elevated Turbidity? (Y/N): N Canopy (% open): 15

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: Stream channel is covered w/ roses, very difficult to access

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

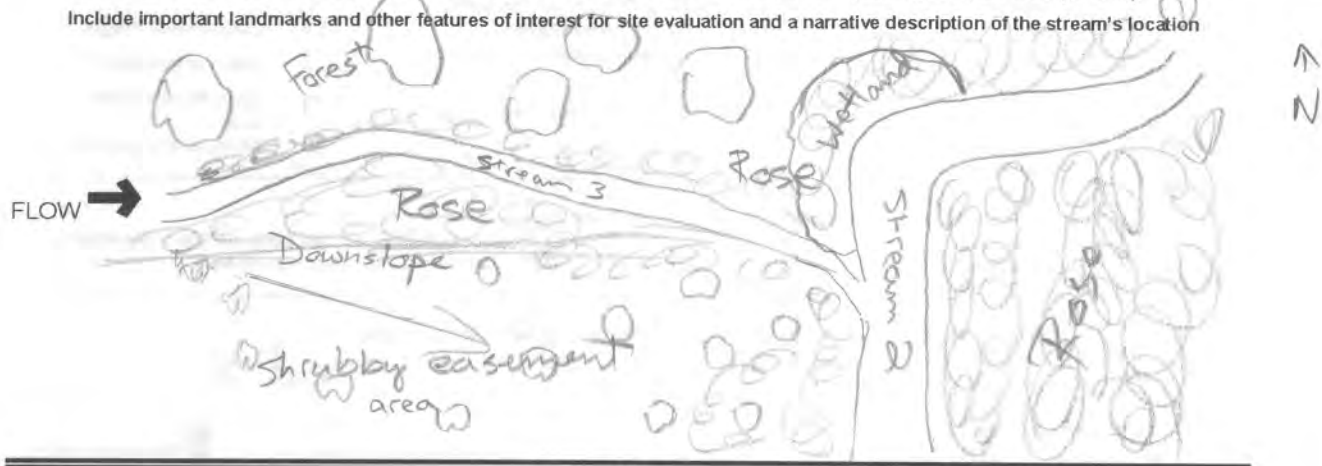
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**






June 20, 2008 Revision

# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 62

SITE NAME/LOCATION Stream 4 / AED

SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) 0.0594

LENGTH OF STREAM REACH (ft) _____ LAT. 40.191861 LONG. -81.842554 RIVER CODE _____ RIVER MILE _____

DATE 6/4/13 SCORER NH MD COMMENTS acid mine drainage

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL MODIFICATIONS:** ☑ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☐ ☑ | SILT [3 pt] | 20 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | | ☑ ☐ | LEAF PACK/WOODY DEBRIS [3 pts] | 45 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | 10 |
| ☐ ☐ | COBBLE (65-256 mm) [12 pts] | | ☐ ☐ | CLAY or HARDPAN [0 pt] | 5 |
| ☐ ☐ | GRAVEL (2-64 mm) [9 pts] | | ☐ ☐ | MUCK [0 pts] | 15 |
| ☐ ☐ | SAND (<2 mm) [6 pts] | 5 | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 6 (B) 6

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** **TOTAL NUMBER OF SUBSTRATE TYPES:**

**HHEI Metric Points** — Substrate Max = 40: 12 (A + B)

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

12.7

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☑ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

**COMMENTS** _____ **MAXIMUM POOL DEPTH (centimeters):** 12.7

**Pool Depth Max = 30:** 25

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

6' dia
4 ft
17 ft
10.5'

- ☐ > 4.0 meters (> 13') [30 pts]
- ☑ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

**COMMENTS** 10.87' = 3.3 m **AVERAGE BANKFULL WIDTH (meters)** 3.3

**Bankfull Width Max=30:** 25

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| L | R | RIPARIAN WIDTH (Per Bank) | L | R | FLOODPLAIN QUALITY (Most Predominant per Bank) | L | R | |
|---|---|---|---|---|---|---|---|---|
| ☑ | ☑ | Wide >10m | ☑ | ☑ | Mature Forest, Wetland | ☐ | ☐ | Conservation Tillage |
| ☐ | ☐ | Moderate 5-10m | ☐ | ☐ | Immature Forest, Shrub or Old Field | ☐ | ☐ | Urban or Industrial |
| ☐ | ☐ | Narrow <5m | ☐ | ☐ | Residential, Park, New Field | ☐ | ☐ | Open Pasture, Row Crop |
| ☐ | ☐ | None | ☐ | ☐ | Fenced Pasture | ☑ | ☑ | Mining or Construction |

COMMENTS historic mining, mine drainage evident

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

- ☑ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

| | | | |
|---|---|---|---|
| ☐ None | ☐ 1.0 | ☐ 2.0 | ☐ 3.0 |
| ☐ 0.5 | ☐ 1.5 | ☐ 2.5 | ☑ >3 |

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☑ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coshocton Township / City: Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/31/13 Quantity: 0.20"/

Photograph Information: Y 1595-1610

Elevated Turbidity? (Y/N): Y Canopy (% open): 25%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: —

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: iron deposits from acid mine drainage

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

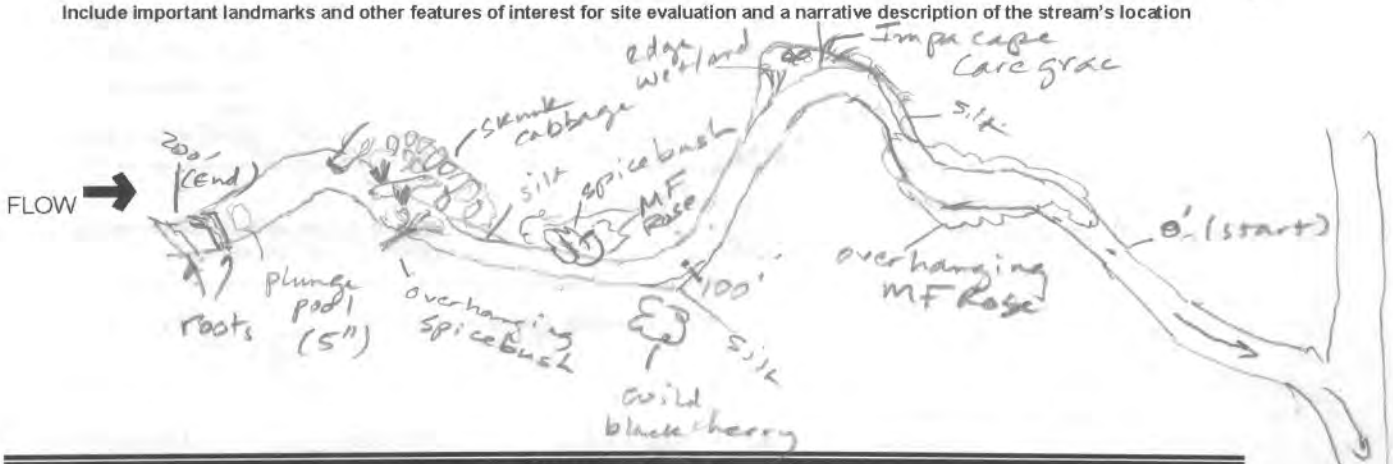
Fish Observed? (Y/N) N Voucher? (Y/N) — Salamanders Observed? (Y/N) N Voucher? (Y/N) —

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) — Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) —

Comments Regarding Biology: _____

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**



streams

# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 56

SITE NAME/LOCATION AEP – Stream 5 5 Points SITE NUMBER 5 RIVER BASIN _____ DRAINAGE AREA (mi²) 0.72

LENGTH OF STREAM REACH (ft) 100 LAT. 40.192647 LONG. -81.842775 RIVER CODE _____ RIVER MILE _____

DATE 6/4/13 SCORER J.A. LS COMMENTS Culvertrd Stream

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL** ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

**MODIFICATIONS:** Culverted, Lg rock in stream & floodplain

1. **SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☐ ☐ | SILT [3 pt] | 15 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | 3 | ☐ ☐ | LEAF PACK/WOODY DEBRIS [3 pts] | 2 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | |
| ☒ ☐ | COBBLE (65-256 mm) [12 pts] | 55 | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☒ | GRAVEL (2-64 mm) [9 pts] | 25 | ☐ ☐ | MUCK [0 pts] | |
| ☐ ☐ | SAND (<2 mm) [6 pts] | | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 58 (A) 21

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:**

(B) 5 **TOTAL NUMBER OF SUBSTRATE TYPES:**

**HHEI Metric Points**

Substrate Max = 40: 26

A + B

2. **Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐ > 30 centimeters [20 pts]
☒ > 22.5 - 30 cm [30 pts]
☐ > 10 - 22.5 cm [25 pts]
☐ > 5 cm - 10 cm [15 pts]
☐ < 5 cm [5 pts]
☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (centimeters):** 26

Pool Depth Max = 30: 25

3. **BANK FULL WIDTH (Measured as the average of 3-4 measurements)** (Check *ONLY* one box):

☐ > 4.0 meters (> 13') [30 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☒ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ **AVERAGE BANKFULL WIDTH (meters)** 0.7

Bankfull Width Max=30: 5

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| L | R | RIPARIAN WIDTH (Per Bank) | L | R | FLOODPLAIN QUALITY (Most Predominant per Bank) | L | R | |
|---|---|---|---|---|---|---|---|---|
| ☐ | ☐ | Wide >10m | ☐ | ☐ | Mature Forest, Wetland | ☐ | ☐ | Conservation Tillage |
| ☐ | ☐ | Moderate 5-10m | ☐ | ☐ | Immature Forest, Shrub or Old Field | ☐ | ☐ | Urban or Industrial |
| ☒ | ☒ | Narrow <5m | ☒ | ☒ | Residential, Park, New Field | ☐ | ☐ | Open Pasture, Row Crop |
| ☐ | ☐ | None | ☐ | ☐ | Fenced Pasture | ☐ | ☐ | Mining or Construction |

COMMENTS narrow wetland feature <2m w/in Riparian zone, immediately bordered by new field

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

☒ Stream Flowing
☐ Subsurface flow with isolated pools (Interstitial)
☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

☐ None ☐ 1.0 ☒ 2.0 ☐ 3.0
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☒ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coshocton Township / City: Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/31/13 Quantity: 0.20in

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 80%

Were samples collected for water chemistry? (Y/N): _____ (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) _____ If not, please explain: _____

Additional comments/description of pollution impacts: culverted @ rd, sediment from Road runoff.

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Y Voucher? (Y/N) N

Comments Regarding Biology: Water striders, snails

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**

* stream only extends 100' from culvert to stream 52

# Ohio EPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 40

SITE NAME/LOCATION Stream 6

AEP - 5 Points SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) 0.0376

LENGTH OF STREAM REACH (ft) 200 LAT. 40.188267 LONG. -81.841134 RIVER CODE _____ RIVER MILE _____

DATE 6/4/12 SCORER LS COMMENTS _____

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL** ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

**MODIFICATIONS:** Moved, old roadside ditch from mining activity, ~65-70' natural at upstream end ends w/ culvert

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☒ ☐ | SILT [3 pt] | 85 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | | ☐ ☒ | LEAF PACK/WOODY DEBRIS [3 pts] | 35 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | 5 |
| ☐ ☐ | COBBLE (65-256 mm) [12 pts] | | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☐ | GRAVEL (2-64 mm) [9 pts] | | ☐ ☐ | MUCK [0 pts] | |
| ☐ ☐ | SAND (<2 mm) [6 pts] | 15 | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 6 (B) 4

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** **TOTAL NUMBER OF SUBSTRATE TYPES:**

**HHEI Metric Points**

**Substrate Max = 40** 10

**A + B**

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐ > 30 centimeters [20 pts]
☐ > 22.5 - 30 cm [30 pts]
☐ > 10 - 22.5 cm [25 pts]
☒ > 5 cm - 10 cm [15 pts]
☐ < 5 cm [5 pts]
☐ NO WATER OR MOIST CHANNEL [0 pts]

**COMMENTS** _____ **MAXIMUM POOL DEPTH (centimeters):** 7

**Pool Depth Max = 30** 15

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

☐ > 4.0 meters (> 13') [30 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
☒ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

**COMMENTS** _____ **AVERAGE BANKFULL WIDTH (meters)** 1.05

**Bankfull Width Max=30** 15

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH L | R | (Per Bank) | FLOODPLAIN QUALITY L | R | (Most Predominant per Bank) | L | R | |
|---|---|---|---|---|---|---|---|---|
| ☒ | ☒ | Wide >10m | ☒ | ☐ | Mature Forest, Wetland | ☐ | ☐ | Conservation Tillage |
| ☐ | ☐ | Moderate 5-10m | ☐ | ☒ | Immature Forest, Shrub or Old Field old road bed | ☐ | ☐ | Urban or Industrial |
| ☐ | ☐ | Narrow <5m | ☐ | ☐ | Residential, Park, New Field | ☐ | ☐ | Open Pasture, Row Crop |
| ☐ | ☐ | None | ☐ | ☐ | Fenced Pasture | ☐ | ☐ | Mining or Construction |

COMMENTS _____

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

☐ Stream Flowing
☐ Subsurface flow with isolated pools (Interstitial)
☒ Moist Channel, isolated pools, no flow (Intermittent)
☐ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0
☐ 0.5 ☒ 1.5 ☐ 2.5 ☐ >3

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coschocton Township / City: Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/31/13 Quantity: 0.20 in

Photograph Information: DSCN4197, DSCN4199, DSCN4200, DSCN4205-DSCN4207

Elevated Turbidity? (Y/N): N Canopy (% open): 3

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: stream appears to be moved/created from construction of old mining road, forming new channel, more natural appearance, lack of stone in substrate indicates ditch characteristics

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

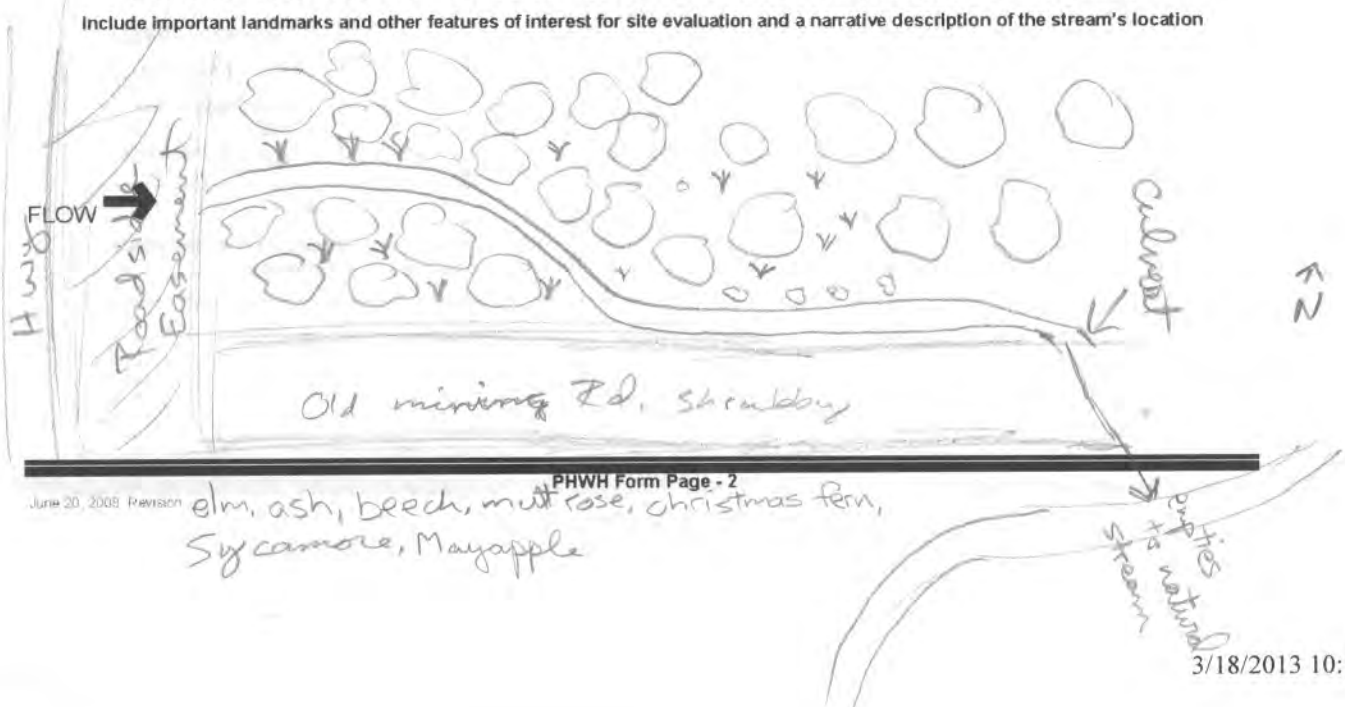
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**




elm, ash, beech, multiflora rose, christmas fern, Sycamore, Mayapple

Class II

# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 32

SITE NAME/LOCATION ACP - Spts Mine Lands - Stream 7

SITE NUMBER S7 RIVER BASIN _____ DRAINAGE AREA (mi²) 0.006

LENGTH OF STREAM REACH (ft) 200 LAT. 40.191070 LONG. -81.863074 RIVER CODE _____ RIVER MILE _____

DATE 7/8/13 SCORER LS COMMENTS _____

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL** ☒ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

**MODIFICATIONS:** flows from culvert, natural stream channel through

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☑ ☐ | SILT [3 pt] | 55 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | | ☐ ☐ | LEAF PACK/WOODY DEBRIS [3 pts] | 15 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | |
| ☐ ☐ | COBBLE (65-256 mm) [12 pts] | | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☐ | GRAVEL (2-64 mm) [9 pts] | | ☐ ☐ | MUCK [0 pts] | |
| ☐ ☑ | SAND (<2 mm) [6 pts] | 30 | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 9

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 3

**HHEI Metric Points**

**Substrate Max = 40** 12

**A + B**

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☑ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

**COMMENTS** _____ **MAXIMUM POOL DEPTH (centimeters):** 8

**Pool Depth Max = 30** 15

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (≤ 3' 3") [5 pts]

**COMMENTS** _____ **AVERAGE BANKFULL WIDTH (meters)** .9

**Bankfull Width Max=30** 5

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH L | R | (Per Bank) | FLOODPLAIN QUALITY L | R | (Most Predominant per Bank) | L | R | |
|---|---|---|---|---|---|---|---|---|
| ☑ | ☑ | Wide >10m | ☐ | ☐ | Mature Forest, Wetland | ☐ | ☐ | Conservation Tillage |
| ☐ | ☐ | Moderate 5-10m | ☑ | ☑ | Immature Forest, Shrub or Old Field | ☐ | ☐ | Urban or Industrial |
| ☐ | ☐ | Narrow <5m | ☐ | ☐ | Residential, Park, New Field | ☐ | ☐ | Open Pasture, Row Crop |
| ☐ | ☐ | None | ☐ | ☐ | Fenced Pasture | ☐ | ☐ | Mining or Construction |

COMMENTS _____

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

- ☑ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

| | | | |
|---|---|---|---|
| ☐ None | ☐ 1.0 | ☑ 2.0 | ☐ 3.0 |
| ☐ 0.5 | ☐ 1.5 | ☐ 2.5 | ☐ >3 |

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☑ Moderate to Severe ☐ Severe (10 ft/100 ft)



June 20, 2008 Revision

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coshocton Township / City: Franklin/Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 7/7/13 Quantity: 0.06

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 5

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) — Dissolved Oxygen (mg/l) — pH (S.U.) — Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: road runoff, culverted under Rd @ Mend

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

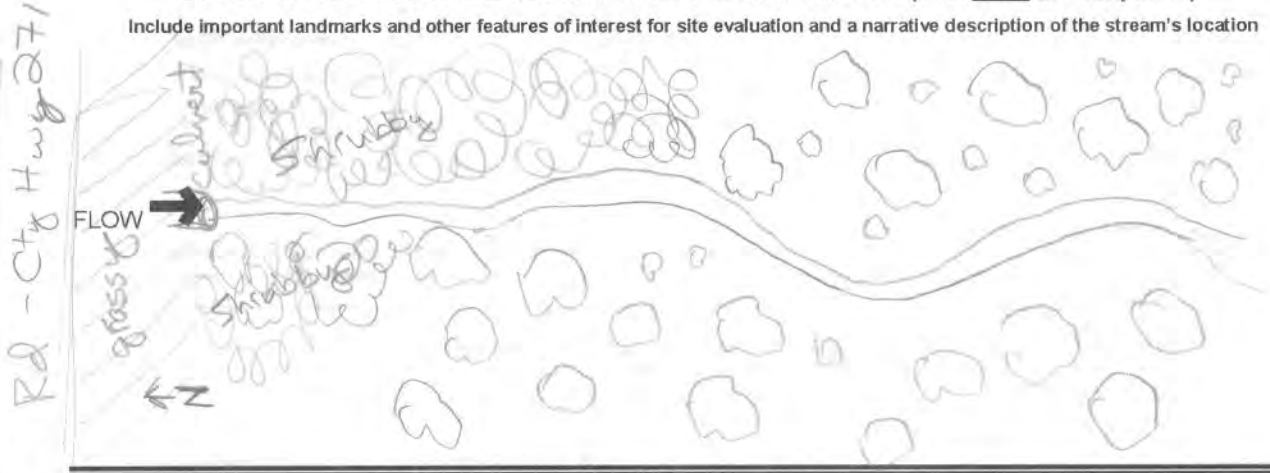
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: NONE observed

## DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**






mult. Rose, box elder, Am. Elm, green ash, Am. Beech, Red oak, tulip poplar

Class I

# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 17

SITE NAME/LOCATION AEP Spts - Stream B

SITE NUMBER SB RIVER BASIN _____ DRAINAGE AREA (mi²) 0.04

LENGTH OF STREAM REACH (ft) 200 LAT. 40.189736 LONG. -81.864100 RIVER CODE _____ RIVER MILE _____

DATE 7/8/13 SCORER LS COMMENTS _____

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL MODIFICATIONS:** ☒ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | | ☐ ☑ | SILT [3 pt] | 25 |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | | ☐ ☐ | LEAF PACK/WOODY DEBRIS [3 pts] | 10 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | |
| ☐ ☐ | COBBLE (65-256 mm) [12 pts] | | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☑ | GRAVEL (2-64 mm) [9 pts] | | ☐ ☐ | MUCK [0 pts] | |
| ☐ ☑ | SAND (<2 mm) [6 pts] | 65 | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 9 (B) 3

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** **TOTAL NUMBER OF SUBSTRATE TYPES:**

**HHEI Metric Points**

**Substrate Max = 40** 12

**A + B**

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (centimeters):** 0

**Pool Depth Max = 30** 0

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ **AVERAGE BANKFULL WIDTH (meters)** .4

**Bankfull Width Max=30** 5

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH L R | (Per Bank) | FLOODPLAIN QUALITY L R | (Most Predominant per Bank) | L R | |
|---|---|---|---|---|---|
| ☒ ☒ | Wide >10m | ☐ ☐ | Mature Forest, Wetland | ☐ ☐ | Conservation Tillage |
| ☐ ☐ | Moderate 5-10m | ☒ ☒ | Immature Forest, Shrub or Old Field | ☐ ☐ | Urban or Industrial |
| ☐ ☐ | Narrow <5m | ☐ ☐ | Residential, Park, New Field | ☐ ☐ | Open Pasture, Row Crop |
| ☐ ☐ | None | ☐ ☐ | Fenced Pasture | ☐ ☐ | Mining or Construction |

COMMENTS _____

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☒ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

| | | | |
|---|---|---|---|
| ☐ None | ☐ 1.0 | ☒ 2.0 | ☐ 3.0 |
| ☐ 0.5 | ☐ 1.5 | ☐ 2.5 | ☐ >3 |

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☒ Moderate to Severe ☐ Severe (10 ft/100 ft)



June 20, 2008 Revision

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Coshocton Township / City: Franklin/Conesville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 7/7/13 Quantity: 0.06

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 20

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) — Dissolved Oxygen (mg/l) — pH (S.U.) — Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

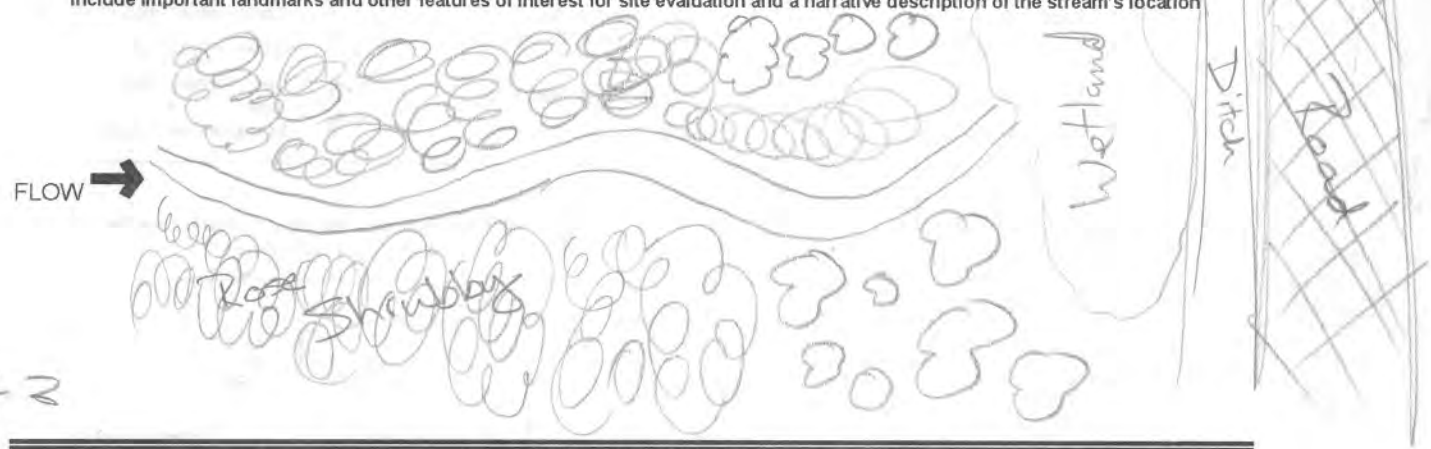
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: NONE observed

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**






June 20, 2008 Revision

Sycamore, spicebush, rose, river grape, box elder, green ash, Am beech

Class III

# OhioEPA Primary Headwater Habitat Evaluation Form

**HHEI Score (sum of metrics 1, 2, 3) :** 67

SITE NAME/LOCATION AEP - SDTS mine lands - stream 3

SITE NUMBER 59 RIVER BASIN _____ DRAINAGE AREA (mi²) 0.07

LENGTH OF STREAM REACH (ft) 200 LAT. 40.188841 LONG. -81.865799 RIVER CODE _____ RIVER MILE _____

DATE 7/8/13 SCORER LS COMMENTS _____

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions**

**STREAM CHANNEL MODIFICATIONS:** ☑ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

**1. SUBSTRATE (Estimate percent of every type of substrate present.** Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | | PERCENT | TYPE | | PERCENT |
|---|---|---|---|---|---|
| ☐ ☐ | BLDR SLABS [16 pts] | 7 | ☐ ☐ | SILT [3 pt] | |
| ☐ ☐ | BOULDER (>256 mm) [16 pts] | 3 | ☐ ☐ | LEAF PACK/WOODY DEBRIS [3 pts] | 5 |
| ☐ ☐ | BEDROCK [16 pt] | | ☐ ☐ | FINE DETRITUS [3 pts] | |
| ☑ ☐ | COBBLE (65-256 mm) [12 pts] | 45 | ☐ ☐ | CLAY or HARDPAN [0 pt] | |
| ☐ ☑ | GRAVEL (2-64 mm) [9 pts] | 25 | ☐ ☐ | MUCK [0 pts] | |
| ☐ ☐ | SAND (<2 mm) [6 pts] | 15 | ☐ ☐ | ARTIFICIAL [3 pts] | |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 55 (A) 21

**SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:**

(B) 6 **TOTAL NUMBER OF SUBSTRATE TYPES:**

**HHEI Metric Points**

**Substrate Max = 40** 27

**A + B**

**2. Maximum Pool Depth** ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☑ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

**COMMENTS** _____ **MAXIMUM POOL DEPTH (centimeters):** 17.5

**Pool Depth Max = 30** 25

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements)** **(Check *ONLY* one box):**

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

**COMMENTS** _____ **AVERAGE BANKFULL WIDTH (meters)** 1.3

**Bankfull Width Max=30** 15

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| L R | RIPARIAN WIDTH (Per Bank) | L R | FLOODPLAIN QUALITY (Most Predominant per Bank) | L R | |
|---|---|---|---|---|---|
| ☑ ☑ | Wide >10m | ☑ ☑ | Mature Forest, Wetland | ☐ ☐ | Conservation Tillage |
| ☐ ☐ | Moderate 5-10m | ☐ ☐ | Immature Forest, Shrub or Old Field | ☐ ☐ | Urban or Industrial |
| ☐ ☐ | Narrow <5m | ☐ ☐ | Residential, Park, New Field | ☐ ☐ | Open Pasture, Row Crop |
| ☐ ☐ | None | ☐ ☐ | Fenced Pasture | ☐ ☐ | Mining or Construction |

COMMENTS _____

**FLOW REGIME** *(At Time of Evaluation)* (Check *ONLY* one box):

- ☑ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☑ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

**STREAM GRADIENT ESTIMATE**

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☑ Severe (10 ft/100 ft)



June 20, 2008 Revision

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Wills Creek NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 7/7/13 Quantity: 0.06

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 5

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) — Dissolved Oxygen (mg/l) — pH (S.U.) — Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: potentially from road runoff

**BIOTIC EVALUATION**

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

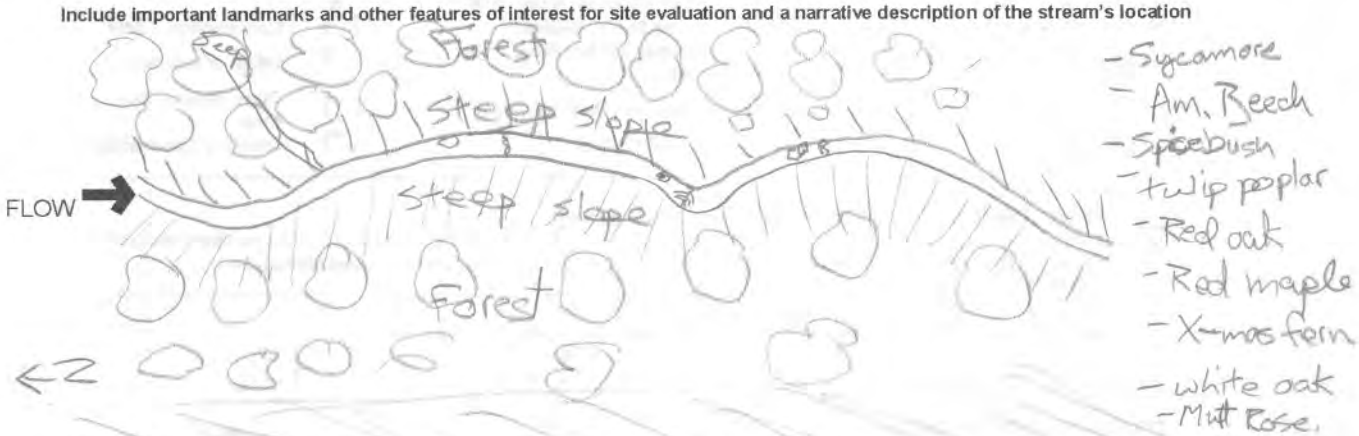
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Y Voucher? (Y/N) N

Comments Regarding Biology: Some EPT

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**



# APPENDIX E

## Response Letters from State & Federal Agencies

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

July 23, 2013

Luke Soposki
MAD Scientist & Associates
253 N. State St., Suite 101
Westerville, OH 43081-2560

TAILS: 03E15000-TA-2013-1152

Re: Five Points Mine Lands Reclamation Project, Conesville, Ohio

Dear Mr. Soposki:

This is in response to your June 18, 2013 letter requesting information regarding federally listed, proposed, and candidate species within the above-referenced proposed project area. The proposed project involves American Electric Power's plans to reclaim a 340-acre site by using fly ash fill to restore the landscape to its original elevation, and reforesting the site after completion. The proposed project is located at 40.188862, -81.851809 in Franklin Township, Coshocton County, Ohio. The project site is primarily forested.

There are no Federal wilderness areas, wildlife refuges, or designated Critical Habitat within the vicinity of the proposed site.

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Before applying for a Section 404 permit, American Energy Corporation should closely evaluate all project alternatives that do not affect streams and wetlands, and if possible, select an alternative that avoids impacts to these resources.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

The project may impact up to 340 acres of suitable Indiana bat habitat, which could represent a significant portion of a home range for a maternity colony of this species. This habitat removal may result in adverse impacts to Indiana bats, even if it occurred during the winter. Therefore, we recommend that a summer survey for Indiana bats be conducted. The survey must be conducted by an approved surveyor and be designed and conducted in coordination with the Endangered Species Coordinator for this office. Summer surveys must be conducted between May 15 and August 15, when the presence of maternity colonies of Indiana bats could be detected.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

Should additional information on listed or proposed species or their critical habitat become available or if new information reveals effects of the action that were not previously considered, our comments and recommendations may be reconsidered. This technical assistance letter is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C.661 et seq.), the Endangered Species Act of 1973, as amended, and is consistent with the intent of the National Environmental Policy Act of 1969, and the U.S. Fish and Wildlife Service's Mitigation Policy. If you have questions, or if we may be of further assistance in this matter, please contact Jeromy Applegate at extension 21 in this office.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH

**Ohio Division of Wildlife**
*Scott Zody, Chief*
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-630

June 21, 2013

Luke Soposki
MAD Scientist & Associates
253 N. State Street, Suite 101
Westerville, OH 43081

Dear Mr. Soposki

I have reviewed the Natural Heritage Database for the AEP - Five Points Mine Lands Reclamation Project area, including a one mile radius, in Franklin Township, Coshocton County, Ohio. We have a record for the state and federally endangered Snuffbox mussel (*Epioblasma triquetra*) in your search area. A map showing the location of this element is provided with this letter.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas.

This letter only represents a review of rare species and natural features data within the Ohio Natural Heritage Database. It does not fulfill coordination under the National Environmental Policy Act (NEPA) or the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S. C. 661 et seq.) and does not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

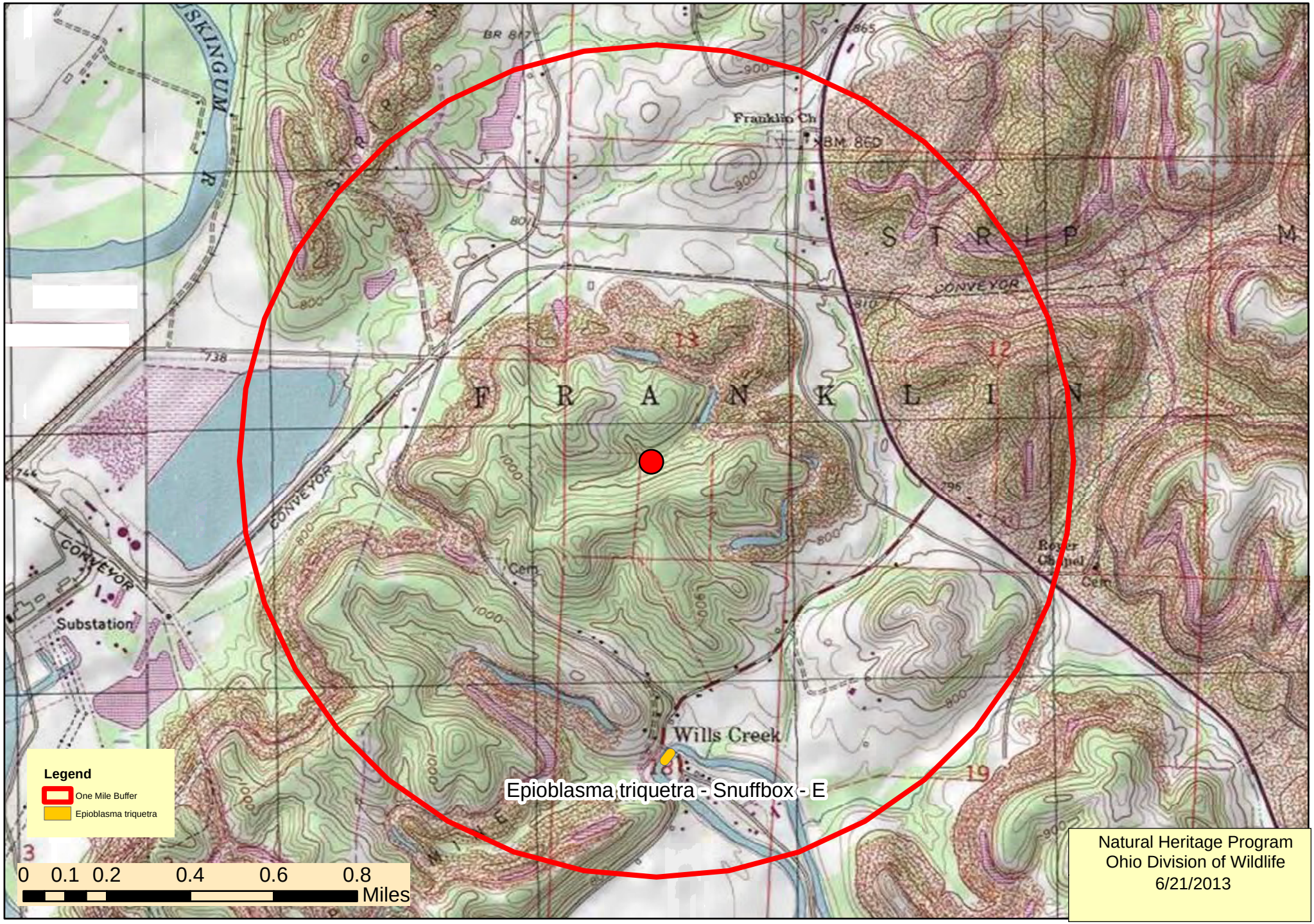
Please contact me at 614-265-6452 if I can be of further assistance.

Sincerely,

Greg Schneider

Greg Schneider, Administrator
Ohio Natural Heritage Program

# AEP - Five Points Mine Lands Reclamation Project




Natural Heritage Program
Ohio Division of Wildlife
6/21/2013

**From:** Sherman, Dave
**Sent:** Friday, June 28, 2013 2:33 PM
**To:** 'luke@madscientistassociates.net'
**Cc:** Xenakis, Stacy; Lopez, Frank
**Subject:** RE: AEP Five Points Mine Lands NAWMP Implications

Hello Luke:

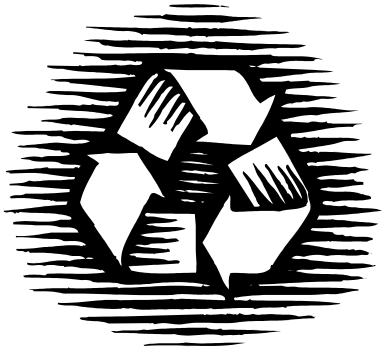
I reviewed the area AEP plans to reclaim with flyash, and there are no implications from the North American Waterfowl Management Plan.

Thanks,
Dave

Dave Sherman
Certified Wildlife Biologist®
Ohio Division of Wildlife
13229 West SR 2
Oak Harbor, OH 43449
419-898-0960 x24

MAD Scientist

& ASSOCIATES LLC



All pages proudly printed on recycled paper
(100% post-consumer content)

# TCLP Characterization Data

Form REP-703
Rev. 0, 4/2012

*Dolan Chemical Laboratory*
*4001 Bixby Road*
*Groveport, OH 43125*
*T: 614-836-4221, Audinet 210-4221*
*F: 614-836-4168, Audinet 210-4168*
*http://aepenv/labs*

## *Water Analysis*

***Location: Conesville Plant*** ***Report Date: 8/16/2013***

### Pond 1

**Sample Number: 132934-001** **Date Collected: 07/10/2013** **Date Received: 7/17/2013**

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | 0.042 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Arsenic, As | 0.28 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Barium, Ba | 23.1 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Cadmium, Cd | 0.023 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Chromium, Cr | 0.3 | ug/L | | 0.20 | 0.040 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Cobalt, Co | 0.656 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Copper, Cu | 0.91 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Lead, Pb | 0.138 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.17 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Nickel, Ni | 3.61 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Selenium, Se | 0.27 | ug/L | J | 0.50 | 0.20 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Silver, Ag | 0.0020 | ug/L | J | 0.010 | 0.0020 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Thallium, Tl | 0.049 | ug/L | J | 0.050 | 0.0020 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Titanium, Ti | < 0.30 | ug/L | U | 2.0 | 0.30 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Zinc, Zn | 5.5 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Aluminum, Al | 0.0375 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:19 | EPA 200.8 |
| Boron, B | 0.166 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Calcium, Ca | 117 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Iron, Fe | 0.344 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Magnesium, Mg | 48.2 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Manganese, Mn | 0.977 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:06 | EPA 200.7 |
| Potassium, K | 5.01 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:05 | EPA 200.7 |
| Sodium, Na | 7.55 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:04 | EPA 200.7 |
| Hardness, Total, as CaCO3 | 494 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |

## Pond 2

**Sample Number:** 132934-002 **Date Collected:** 07/10/2013 **Date Received:** 7/17/2013

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | 0.029 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Arsenic, As | 0.29 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Barium, Ba | 23.6 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Cadmium, Cd | 0.014 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Chromium, Cr | 0.2 | ug/L | | 0.20 | 0.040 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Cobalt, Co | 0.651 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Copper, Cu | 1.06 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Lead, Pb | 0.100 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.08 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Nickel, Ni | 3.54 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Selenium, Se | 0.22 | ug/L | J | 0.50 | 0.20 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Silver, Ag | < 0.0020 | ug/L | U | 0.010 | 0.0020 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Thallium, Tl | 0.032 | ug/L | J | 0.050 | 0.0020 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Titanium, Ti | 0.49 | ug/L | J | 2.0 | 0.30 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Zinc, Zn | 5.1 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Aluminum, Al | 0.0381 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:24 | EPA 200.8 |
| Boron, B | 0.149 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Calcium, Ca | 109 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Iron, Fe | 0.288 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Magnesium, Mg | 44.7 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Manganese, Mn | 0.975 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:17 | EPA 200.7 |
| Potassium, K | 5.12 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:16 | EPA 200.7 |
| Sodium, Na | 7.33 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:15 | EPA 200.7 |
| Hardness, Total, as CaCO3 | 459 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |

## AMD 1

**Sample Number:** 132934-003 **Date Collected:** 07/10/2013 **Date Received:** 7/17/2013

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | 0.012 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Arsenic, As | 0.38 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Barium, Ba | 13.3 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Cadmium, Cd | 0.028 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Chromium, Cr | 0.14 | ug/L | J | 0.20 | 0.040 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Cobalt, Co | 3.05 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Copper, Cu | 0.10 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Lead, Pb | 0.087 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.032 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Nickel, Ni | 4.44 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Selenium, Se | 0.28 | ug/L | J | 0.50 | 0.20 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Silver, Ag | < 0.0020 | ug/L | U | 0.010 | 0.0020 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Thallium, Tl | 0.11 | ug/L | | 0.050 | 0.0020 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Titanium, Ti | < 0.30 | ug/L | U | 2.0 | 0.30 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Zinc, Zn | 6.9 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Aluminum, Al | 0.0642 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:29 | EPA 200.8 |
| Boron, B | 0.142 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Calcium, Ca | 92.9 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Iron, Fe | 7.42 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Magnesium, Mg | 34.5 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Manganese, Mn | 1.78 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:19 | EPA 200.7 |
| Potassium, K | 5.01 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:18 | EPA 200.7 |
| Sodium, Na | 8.93 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:18 | EPA 200.7 |
| Hardness, Total, as CaCO3 | 377 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |

## AMD 2

**Sample Number:** 132934-004 **Date Collected:** 07/10/2013 **Date Received:** 7/17/2013

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | < 0.010 | ug/L | U | 0.050 | 0.010 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Arsenic, As | 0.37 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Barium, Ba | 13.1 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:21 | EPA 200.7 |
| Cadmium, Cd | < 0.010 | ug/L | U | 0.050 | 0.010 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Chromium, Cr | 0.2 | ug/L | | 0.20 | 0.040 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Cobalt, Co | 3.04 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Copper, Cu | 0.11 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Lead, Pb | 0.095 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.037 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Nickel, Ni | 4.63 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Selenium, Se | < 0.20 | ug/L | U | 0.50 | 0.20 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Silver, Ag | 0.0020 | ug/L | J | 0.010 | 0.0020 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Thallium, Tl | 0.11 | ug/L | | 0.050 | 0.0020 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:22 | EPA 200.7 |
| Titanium, Ti | < 0.30 | ug/L | U | 2.0 | 0.30 | DAM | 07/31/2013 17:21 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:22 | EPA 200.7 |
| Zinc, Zn | 6.5 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Aluminum, Al | 0.0648 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:34 | EPA 200.8 |
| Boron, B | 0.133 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:22 | EPA 200.7 |
| Calcium, Ca | 88.9 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:21 | EPA 200.7 |
| Iron, Fe | 7.57 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:21 | EPA 200.7 |
| Magnesium, Mg | 33.4 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:21 | EPA 200.7 |
| Manganese, Mn | 1.72 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:21 | EPA 200.7 |
| Potassium, K | 4.78 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:20 | EPA 200.7 |
| Sodium, Na | 8.57 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:20 | EPA 200.7 |
| Hardness, Total, as CaCO3 | 362 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |

## AMD 3

**Sample Number:** 132934-005 **Date Collected:** 07/15/2013 **Date Received:** 7/17/2013

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | 0.015 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Arsenic, As | 0.40 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Barium, Ba | 12.9 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Cadmium, Cd | < 0.010 | ug/L | U | 0.050 | 0.010 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Chromium, Cr | < 0.040 | ug/L | U | 0.20 | 0.040 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Cobalt, Co | 2.59 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Copper, Cu | 0.47 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Lead, Pb | 0.118 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.028 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Nickel, Ni | 4.10 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Selenium, Se | < 0.20 | ug/L | U | 0.50 | 0.20 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Silver, Ag | < 0.0020 | ug/L | U | 0.010 | 0.0020 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Thallium, Tl | 0.11 | ug/L | | 0.050 | 0.0020 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Titanium, Ti | < 0.30 | ug/L | U | 2.0 | 0.30 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Zinc, Zn | 7.3 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Aluminum, Al | 0.0454 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:38 | EPA 200.8 |
| Boron, B | 0.128 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Calcium, Ca | 89.7 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Iron, Fe | 5.14 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Magnesium, Mg | 32.8 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Manganese, Mn | 1.68 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:24 | EPA 200.7 |
| Potassium, K | 4.63 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:23 | EPA 200.7 |
| Sodium, Na | 8.51 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:23 | EPA 200.7 |
| Acidity, as CaCO3 | 46.9 | mg/L | | 5.0 | 1.0 | WKE | 07/24/2013 | SM20 2310B |
| Alkalinity, as CaCO3 | < 1.0 | mg/L | U | 5.0 | 1.0 | WKE | 07/23/2013 | SM20 2320B |
| Bicarbonate Alkalinity | < 2.0 | mg/L | U | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Carbonate Alkalinity | < 2.0 | mg/L | U | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Chloride, Cl | 7.0 | mg/L | | 0.10 | 0.020 | TJK | 07/23/2013 | EPA 300.1 |
| Hardness, Total, as CaCO3 | 361 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |
| Residue, Filterable, TDS | 665 | mg/L | | 20 | 6.0 | MSO | 07/22/2013 | SM20 2540C |
| Sulfate, SO4 | 412 | mg/L | | 2.5 | 0.75 | TJK | 07/23/2013 | EPA 300.1 |
| Hydrogen Ion (pH) | 3.61 | s.u. | | 0.10 | 0.020 | WKE | 07/23/2013 | SM20 4500-H B |
| Specific Conductance (@ 25° C) | 894 | umho/cm | | 20 | 4.0 | WKE | 07/30/2013 | SM20 2510B |

## AMD 4

**Sample Number:** 132934-006 **Date Collected:** 07/15/2013 **Date Received:** 7/17/2013

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | < 0.010 | ug/L | U | 0.050 | 0.010 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Arsenic, As | 0.46 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Barium, Ba | 13.4 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Cadmium, Cd | 0.013 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Chromium, Cr | < 0.040 | ug/L | U | 0.20 | 0.040 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Cobalt, Co | 2.58 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Copper, Cu | 0.10 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Lead, Pb | 0.069 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.020 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Nickel, Ni | 4.18 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Selenium, Se | < 0.20 | ug/L | U | 0.50 | 0.20 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Silver, Ag | < 0.0020 | ug/L | U | 0.010 | 0.0020 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Thallium, Tl | 0.12 | ug/L | | 0.050 | 0.0020 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Titanium, Ti | < 0.30 | ug/L | U | 2.0 | 0.30 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Zinc, Zn | 6.5 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Aluminum, Al | 0.0463 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:43 | EPA 200.8 |
| Boron, B | 0.128 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Calcium, Ca | 90.1 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Iron, Fe | 5.01 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Magnesium, Mg | 32.4 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Manganese, Mn | 1.68 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:26 | EPA 200.7 |
| Potassium, K | 4.59 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:25 | EPA 200.7 |
| Sodium, Na | 8.45 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:25 | EPA 200.7 |
| Acidity, as CaCO3 | 42.8 | mg/L | | 5.0 | 1.0 | WKE | 07/24/2013 | SM20 2310B |
| Alkalinity, as CaCO3 | < 1.0 | mg/L | U | 5.0 | 1.0 | WKE | 07/23/2013 | SM20 2320B |
| Bicarbonate Alkalinity | < 2.0 | mg/L | U | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Carbonate Alkalinity | < 2.0 | mg/L | U | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Chloride, Cl | 7.0 | mg/L | | 0.10 | 0.020 | TJK | 07/23/2013 | EPA 300.1 |
| Hardness, Total, as CaCO3 | 361 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |
| Residue, Filterable, TDS | 681 | mg/L | | 20 | 6.0 | MSO | 07/22/2013 | SM20 2540C |
| Sulfate, SO4 | 399 | mg/L | | 2.5 | 0.75 | TJK | 07/23/2013 | EPA 300.1 |
| Hydrogen Ion (pH) | 3.59 | s.u. | | 0.10 | 0.020 | WKE | 07/23/2013 | SM20 4500-H B |
| Specific Conductance (@ 25° C) | 896 | umho/cm | | 20 | 4.0 | WKE | 07/30/2013 | SM20 2510B |

## Pond 3

**Sample Number:** 132934-007 **Date Collected:** 07/15/2013 **Date Received:** 7/17/2013

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | 0.033 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Arsenic, As | 0.24 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Barium, Ba | 31.4 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Cadmium, Cd | 0.014 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Chromium, Cr | < 0.040 | ug/L | U | 0.20 | 0.040 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Cobalt, Co | 0.803 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Copper, Cu | 0.18 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Lead, Pb | 0.021 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.13 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Nickel, Ni | 4.84 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Selenium, Se | 0.39 | ug/L | J | 0.50 | 0.20 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Silver, Ag | < 0.0020 | ug/L | U | 0.010 | 0.0020 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Thallium, Tl | 0.06 | ug/L | | 0.050 | 0.0020 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Titanium, Ti | < 0.30 | ug/L | U | 2.0 | 0.30 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Zinc, Zn | 4.7 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Aluminum, Al | 0.0318 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:48 | EPA 200.8 |
| Boron, B | 0.238 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Calcium, Ca | 137 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Iron, Fe | 0.295 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Magnesium, Mg | 48.5 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Manganese, Mn | 1.12 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:30 | EPA 200.7 |
| Potassium, K | 5.87 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:29 | EPA 200.7 |
| Sodium, Na | 8.85 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:28 | EPA 200.7 |
| Acidity, as CaCO3 | 23.8 | mg/L | | 5.0 | 1.0 | WKE | 07/24/2013 | SM20 2310B |
| Alkalinity, as CaCO3 | 7.9 | mg/L | | 5.0 | 1.0 | WKE | 07/23/2013 | SM20 2320B |
| Bicarbonate Alkalinity | 8 | mg/L | | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Carbonate Alkalinity | < 2.0 | mg/L | U | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Chloride, Cl | 13.8 | mg/L | | 0.10 | 0.020 | TJK | 07/23/2013 | EPA 300.1 |
| Hardness, Total, as CaCO3 | 546 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |
| Residue, Filterable, TDS | 901 | mg/L | | 20 | 6.0 | MSO | 07/22/2013 | SM20 2540C |
| Sulfate, SO4 | 540 | mg/L | | 2.5 | 0.75 | TJK | 07/23/2013 | EPA 300.1 |
| Hydrogen Ion (pH) | 5.92 | s.u. | | 0.10 | 0.020 | WKE | 07/23/2013 | SM20 4500-H B |
| Specific Conductance (@ 25° C) | 1040 | umho/cm | | 20 | 4.0 | WKE | 07/30/2013 | SM20 2510B |

## Pond 4

**Sample Number:** 132934-008 **Date Collected:** 07/15/2013 **Date Received:** 7/17/2013

| Parameter | Result | Units | Data Qual | RL | MDL | Analysis By | Analysis Date/Time | Method |
|---|---|---|---|---|---|---|---|---|
| Antimony, Sb | 0.036 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Arsenic, As | 0.22 | ug/L | | 0.10 | 0.030 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Barium, Ba | 28.7 | ug/L | | 0.10 | 0.020 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Beryllium, Be | < 0.10 | ug/L | U | 0.50 | 0.10 | DAM | 07/31/2013 17:33 | EPA 200.7 |
| Cadmium, Cd | 0.020 | ug/L | J | 0.050 | 0.010 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Chromium, Cr | < 0.040 | ug/L | U | 0.20 | 0.040 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Cobalt, Co | 0.727 | ug/L | | 0.020 | 0.0040 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Copper, Cu | 0.18 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Lead, Pb | 0.018 | ug/L | | 0.010 | 0.0020 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Mercury, Hg | < 0.30 | ug/L | U | 2.0 | 0.30 | DMM | 07/22/2013 | EPA 245.2 |
| Molybdenum, Mo | 0.10 | ug/L | | 0.050 | 0.010 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Nickel, Ni | 4.36 | ug/L | | 0.20 | 0.050 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Selenium, Se | 0.30 | ug/L | J | 0.50 | 0.20 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Silver, Ag | < 0.0020 | ug/L | U | 0.010 | 0.0020 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Thallium, Tl | 0.05 | ug/L | | 0.050 | 0.0020 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Tin, Sn | < 1.0 | ug/L | U | 5.0 | 1.0 | DAM | 07/31/2013 17:34 | EPA 200.7 |
| Titanium, Ti | < 0.30 | ug/L | U | 2.0 | 0.30 | DAM | 07/31/2013 17:33 | EPA 200.7 |
| Vanadium, V | < 0.50 | ug/L | U | 2.0 | 0.50 | DAM | 07/31/2013 17:34 | EPA 200.7 |
| Zinc, Zn | 4.4 | ug/L | | 0.50 | 0.10 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Aluminum, Al | 0.0291 | mg/L | | 0.0010 | 0.0003 | DPC | 07/24/2013 13:53 | EPA 200.8 |
| Boron, B | 0.230 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:33 | EPA 200.7 |
| Calcium, Ca | 133 | mg/L | | 0.020 | 0.0040 | DAM | 07/31/2013 17:33 | EPA 200.7 |
| Iron, Fe | 0.286 | mg/L | | 0.050 | 0.010 | DAM | 07/31/2013 17:33 | EPA 200.7 |
| Magnesium, Mg | 46.3 | mg/L | | 0.010 | 0.0020 | DAM | 07/31/2013 17:33 | EPA 200.7 |
| Manganese, Mn | 1.06 | mg/L | | 0.0005 | 0.0001 | DAM | 07/31/2013 17:33 | EPA 200.7 |
| Potassium, K | 5.77 | mg/L | | 0.050 | 0.0070 | DAM | 07/31/2013 17:32 | EPA 200.7 |
| Sodium, Na | 8.69 | mg/L | | 0.050 | 0.0080 | DAM | 07/31/2013 17:32 | EPA 200.7 |
| Acidity, as CaCO3 | 19.7 | mg/L | | 5.0 | 1.0 | WKE | 07/24/2013 | SM20 2310B |
| Alkalinity, as CaCO3 | 8.2 | mg/L | | 5.0 | 1.0 | WKE | 07/23/2013 | SM20 2320B |
| Bicarbonate Alkalinity | 8 | mg/L | | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Carbonate Alkalinity | < 2.0 | mg/L | U | 5.0 | 2.0 | WKE | 07/23/2013 | SM20 4500-CO2D |
| Chloride, Cl | 13.9 | mg/L | | 0.10 | 0.020 | TJK | 07/23/2013 | EPA 300.1 |
| Hardness, Total, as CaCO3 | 525 | mg/L | | 0.10 | 0.020 | BSS | 08/16/2013 | SM20 2340B |
| Residue, Filterable, TDS | 884 | mg/L | | 20 | 6.0 | MSO | 07/22/2013 | SM20 2540C |
| Sulfate, SO4 | 538 | mg/L | | 2.5 | 0.75 | TJK | 07/23/2013 | EPA 300.1 |
| Hydrogen Ion (pH) | 5.94 | s.u. | | 0.10 | 0.020 | WKE | 07/23/2013 | SM20 4500-H B |
| Specific Conductance (@ 25° C) | 1040 | umho/cm | | 20 | 4.0 | WKE | 07/30/2013 | SM20 2510B |

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Conesville Five Points Phase 3.

The pH was analyzed beyond the 15 minute hold period.

***Brian Snyder, Chemist II***

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*Fax 614-836-4168* *Audinet 210-4224*

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

Form REP-701
Rev. 0, 4/2012

*Dolan Chemical Laboratory*
*4001 Bixby Road*
*Groveport, OH 43125*
*T: 614-836-4221, Audinet 210-4221*
*F: 614-836-4168, Audinet 210-4168*
*http://aepenv/labs*

## *Waste Analysis*

***Location: Conesville Plant*** ***Report Date: 3/30/2015***

**70/20/10 FGD/Gyp/FA** ***TCLP per SW-846(Mod), 1311-1992***

**Sample Number: 150847-001** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | < 0.0100 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.201 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0296 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00611 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.294 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 1.46 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 0.0202 | mg/L | DAM | 03/18/2015 09:15 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 23.6 | mg/L | DAM | 03/18/2015 09:13 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 594 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 67.6 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.380 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 998 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 210 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 11.77 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

## 70/20/10 FGD/Gyp/FA Pond Water

***TCLP per SW-846(Mod), 1311-1992***

**Sample Number:** **150847-001A** **Date Collected:** **03/11/2015 11:00** **Date Received:** **3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.0120 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.176 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0382 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00789 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.232 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 1.40 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 0.0232 | mg/L | DAM | 03/18/2015 10:11 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 30.7 | mg/L | DAM | 03/18/2015 10:10 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 482 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 81.7 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.540 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 1190 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 404 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 11.76 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

**Sample was leached using pond water.**

**Ponded FA** *TCLP per SW-846(Mod), 1311-1992*

**Sample Number: 150847-002** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.118 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0199 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | 0.000978 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0284 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00103 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 1.06 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 0.346 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 0.688 | mg/L | DAM | 03/18/2015 09:28 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 0.553 | mg/L | DAM | 03/18/2015 09:27 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 38.5 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | < 0.100 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| LRB Cl >MDL but <RL | | | | | | |
| Fluoride, F | 0.262 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | < 80.0 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 20.1 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 9.54 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

## Ponded FA Pond Water

***TCLP per SW-846(Mod), 1311-1992***

**Sample Number:** 150847-002A **Date Collected:** 03/11/2015 11:00 **Date Received:** 3/12/2015

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.0686 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0510 | mg/L | DAM | 03/18/2015 10:16 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 10:16 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | 0.000569 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 10:16 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0354 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00219 | mg/L | DAM | 03/18/2015 10:16 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.104 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 0.381 | mg/L | DAM | 03/18/2015 10:16 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 10:17 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 23.0 | mg/L | DAM | 03/18/2015 10:16 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 9.75 | mg/L | DAM | 03/18/2015 10:15 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 47.8 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 20.9 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.316 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 412 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 264 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 9.14 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

**Sample was leached using pond water.**

**FA** *TCLP per SW-846(Mod), 1311-1992*

**Sample Number: 150847-003** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.120 | mg/L | DAM | 03/18/2015 09:34 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0598 | mg/L | DAM | 03/18/2015 09:33 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 09:33 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | 0.000976 | mg/L | DAM | 03/18/2015 09:34 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 09:33 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 09:34 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 09:34 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0728 | mg/L | DAM | 03/18/2015 09:34 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00287 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 09:34 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 3.09 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 9.26 | mg/L | DAM | 03/18/2015 09:33 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 09:34 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 6.78 | mg/L | DAM | 03/18/2015 09:33 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 38.1 | mg/L | DAM | 03/18/2015 09:32 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 56.8 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 3.08 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.796 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 588 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 386 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 9.20 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

## FA Pond Water

***TCLP per SW-846(Mod), 1311-1992***

**Sample Number: 150847-003A** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.0988 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0669 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | 0.000765 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | 0.00267 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0576 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00137 | mg/L | DAM | 03/18/2015 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.999 | mg/L | DAM | 03/18/2015 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 8.28 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 28.6 | mg/L | DAM | 03/18/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 39.7 | mg/L | DAM | 03/18/2015 10:28 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 49.7 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 24.0 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.788 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 928 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 600 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 8.84 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

**Sample was leached using pond water.**

**BA** *TCLP per SW-846(Mod), 1311-1992*

**Sample Number: 150847-004** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.0180 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0118 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | < 0.0200 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | < 0.00100 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.425 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 0.252 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 3.45 | mg/L | DAM | 03/18/2015 09:39 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 1.16 | mg/L | DAM | 03/18/2015 09:37 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 35.2 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 0.416 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | < 0.100 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | < 80.0 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 36.0 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 9.26 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

## BA Pond Water

***TCLP per SW-846(Mod), 1311-1992***

**Sample Number:** 150847-004A **Date Collected:** 03/11/2015 11:00 **Date Received:** 3/12/2015

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | < 0.0100 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0467 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | < 0.0200 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00268 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | < 0.0200 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 0.281 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 28.1 | mg/L | DAM | 03/18/2015 10:35 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 10.6 | mg/L | DAM | 03/18/2015 10:33 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 46.5 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 21.0 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.162 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 408 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 275 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 8.55 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

**Sample was leached using pond water.**

**FGD** *TCLP per SW-846(Mod), 1311-1992*

**Sample Number: 150847-005** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.0163 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.161 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0330 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00706 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.326 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 1.52 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 0.0244 | mg/L | DAM | 03/18/2015 09:44 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 30.9 | mg/L | DAM | 03/18/2015 09:42 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 515 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 63.2 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.500 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 816 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 132 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 11.68 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

## FGD Pond Water

***TCLP per SW-846(Mod), 1311-1992***

**Sample Number: 150847-005A** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | 0.0111 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.204 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | < 0.00200 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0307 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00658 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.536 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 1.54 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 0.0162 | mg/L | DAM | 03/18/2015 10:40 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 22.0 | mg/L | DAM | 03/18/2015 10:39 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 415 | mg/L | GES | 03/17/2015 | SM 2320B-1997 | |
| Chloride, Cl | 79.4 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 0.510 | mg/L | CRJ | 03/16/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 1080 | mg/L | SDB | 03/17/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 380 | mg/L | CRJ | 03/17/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | 11.68 | s.u. | JWB | 03/13/2015 | SM 4500-F B-2000 | |

**Sample was leached using pond water.**

## Gypsum

***TCLP per SW-846(Mod), 1311-1992***

**Sample Number: 150847-006** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | < 0.0100 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0211 | mg/L | DAM | 03/20/2015 10:24 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/20/2015 10:24 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/20/2015 10:24 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | 0.00226 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0644 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00908 | mg/L | DAM | 03/20/2015 10:24 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | 0.414 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 0.109 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 0.641 | mg/L | DAM | 03/20/2015 10:25 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 0.881 | mg/L | DAM | 03/20/2015 10:23 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 26.7 | mg/L | GES | 03/19/2015 | SM 2320B-1997 | |
| Chloride, Cl | 0.692 | mg/L | CRJ | 03/19/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 3.15 | mg/L | CRJ | 03/19/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 2120 | mg/L | SDB | 03/19/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 1530 | mg/L | CRJ | 03/19/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | | s.u. | JWB | | SM 4500-F B-2000 | |

**Gypsum Pond Water** ***TCLP per SW-846(Mod), 1311-1992***

**Sample Number: 150847-006A** **Date Collected: 03/11/2015 11:00** **Date Received: 3/12/2015**

| Parameter | Result | Units | Analysis By | Analysis Date/Time | Method | USEPA Limit |
|---|---|---|---|---|---|---|
| Arsenic, As | < 0.0100 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Barium, Ba | 0.0285 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 100 |
| Beryllium, Be | < 0.000500 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Cadmium, Cd | < 0.000500 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Copper, Cu | < 0.00500 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Lead, Pb | < 0.0100 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Mercury, Hg | < 0.0001 | mg/L | JAB | 03/23/2015 | EPA 245.7-2005, Rev. 2.0 | 0.2 |
| Nickel, Ni | 0.00615 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Selenium, Se | 0.0552 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 1 |
| Silver, Ag | 0.00934 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | 5 |
| Zinc, Zn | < 0.00200 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Aluminum, Al | < 0.0200 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Boron, B | 0.180 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Iron, Fe | < 0.00500 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Magnesium, Mg | 23.8 | mg/L | DAM | 03/20/2015 10:30 | EPA 200.7-1994, Rev. 4.4 | |
| Sodium, Na | 10.8 | mg/L | DAM | 03/20/2015 10:28 | EPA 200.7-1994, Rev. 4.4 | |
| Acidity, as CaCO3 | < 5.00 | mg/L | GES | 03/19/2015 | SM 2310B-1997 | |
| Alkalinity, as CaCO3 | 32.3 | mg/L | GES | 03/19/2015 | SM 2320B-1997 | |
| Chloride, Cl | 21.8 | mg/L | CRJ | 03/19/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Fluoride, F | 3.20 | mg/L | CRJ | 03/19/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Residue, Filterable, TDS | 2300 | mg/L | SDB | 03/19/2015 | SM 2540C-1997 | |
| Sulfate, SO4 | 1650 | mg/L | CRJ | 03/19/2015 | EPA 300.1-1997, Rev. 1.0 | |
| Hydrogen Ion (pH) | | s.u. | JWB | | SM 4500-F B-2000 | |

**Sample was leached using pond water.**

Daniel A. Musgrave

***Dan Musgrave, Chemist Principal***

*Email damusgrave@aep.com Tel. 614-836-4282*

*Fax 614-836-4168 Audinet 210-4282*

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# ODNR Correspondence

**Ohio Division of Wildlife**
*Scott Zody, Chief*
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-630

June 21, 2013

Luke Soposki
MAD Scientist & Associates
253 N. State Street, Suite 101
Westerville, OH 43081

Dear Mr. Soposki

I have reviewed the Natural Heritage Database for the AEP - Five Points Mine Lands Reclamation Project area, including a one mile radius, in Franklin Township, Coshocton County, Ohio. We have a record for the state and federally endangered Snuffbox mussel (*Epioblasma triquetra*) in your search area. A map showing the location of this element is provided with this letter.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas.

This letter only represents a review of rare species and natural features data within the Ohio Natural Heritage Database. It does not fulfill coordination under the National Environmental Policy Act (NEPA) or the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S. C. 661 et seq.) and does not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

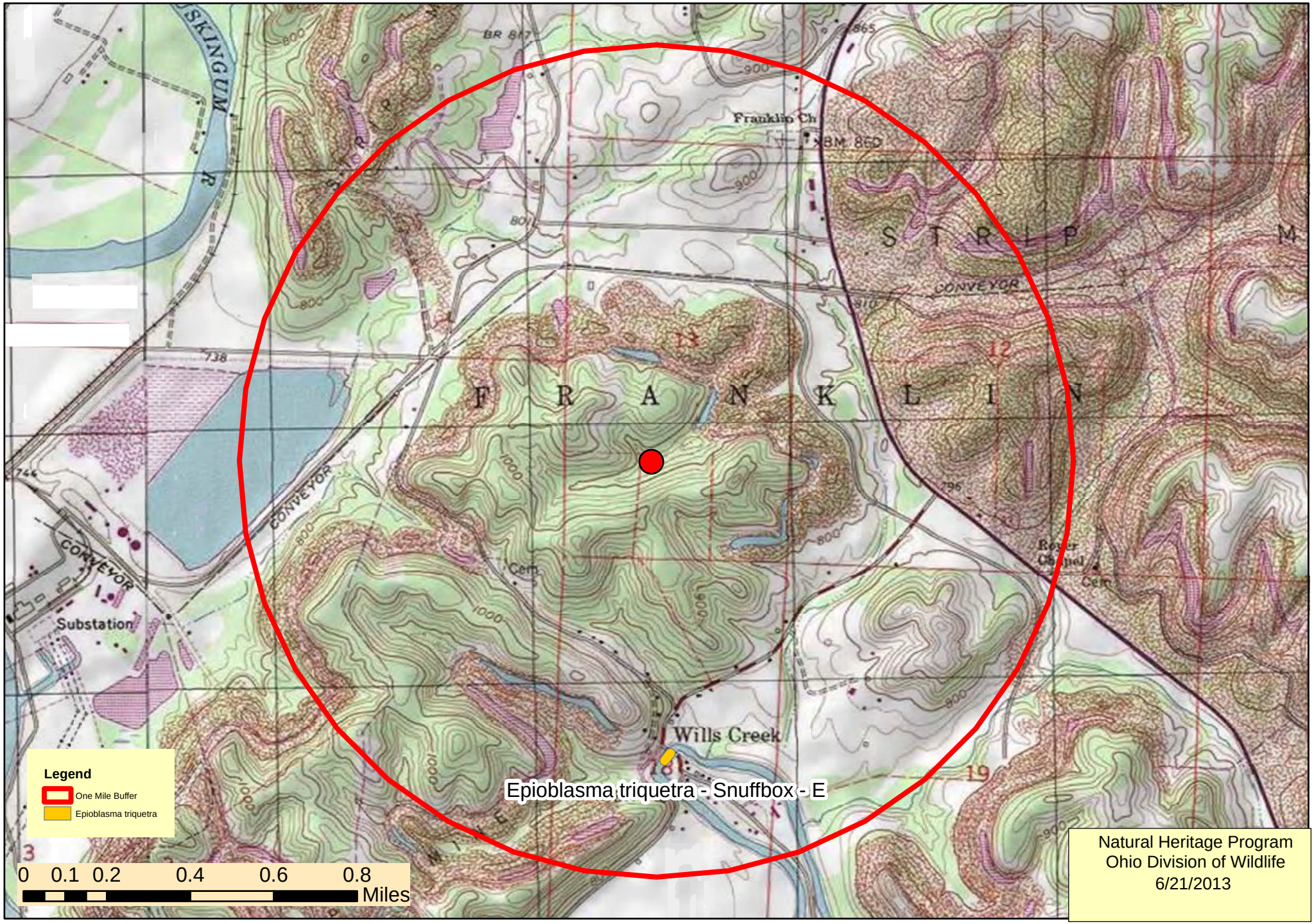
Please contact me at 614-265-6452 if I can be of further assistance.

Sincerely,

Greg Schneider

Greg Schneider, Administrator
Ohio Natural Heritage Program

# AEP - Five Points Mine Lands Reclamation Project




Natural Heritage Program
Ohio Division of Wildlife
6/21/2013

# USFWS Correspondences and Mist Net Survey Report

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

July 23, 2013

Luke Soposki
MAD Scientist & Associates
253 N. State St., Suite 101
Westerville, OH 43081-2560

TAILS: 03E15000-TA-2013-1152

Re: Five Points Mine Lands Reclamation Project, Conesville, Ohio

Dear Mr. Soposki:

This is in response to your June 18, 2013 letter requesting information regarding federally listed, proposed, and candidate species within the above-referenced proposed project area. The proposed project involves American Electric Power's plans to reclaim a 340-acre site by using fly ash fill to restore the landscape to its original elevation, and reforesting the site after completion. The proposed project is located at 40.188862, -81.851809 in Franklin Township, Coshocton County, Ohio. The project site is primarily forested.

There are no Federal wilderness areas, wildlife refuges, or designated Critical Habitat within the vicinity of the proposed site.

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Before applying for a Section 404 permit, American Energy Corporation should closely evaluate all project alternatives that do not affect streams and wetlands, and if possible, select an alternative that avoids impacts to these resources.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

The project may impact up to 340 acres of suitable Indiana bat habitat, which could represent a significant portion of a home range for a maternity colony of this species. This habitat removal may result in adverse impacts to Indiana bats, even if it occurred during the winter. Therefore, we recommend that a summer survey for Indiana bats be conducted. The survey must be conducted by an approved surveyor and be designed and conducted in coordination with the Endangered Species Coordinator for this office. Summer surveys must be conducted between May 15 and August 15, when the presence of maternity colonies of Indiana bats could be detected.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

Should additional information on listed or proposed species or their critical habitat become available or if new information reveals effects of the action that were not previously considered, our comments and recommendations may be reconsidered. This technical assistance letter is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C.661 et seq.), the Endangered Species Act of 1973, as amended, and is consistent with the intent of the National Environmental Policy Act of 1969, and the U.S. Fish and Wildlife Service's Mitigation Policy. If you have questions, or if we may be of further assistance in this matter, please contact Jeromy Applegate at extension 21 in this office.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH

AEP
AMERICAN ELECTRIC POWER

American Electric Power
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Columbus, OH 43215-2373
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Mr. Jeromy Applegate
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service, Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230

December 17, 2014

**Re: AEP Generation Resources Inc. – Conesville Plant**
**Five Points AML Reclamation Project – Coshocton County, Ohio**
**Mist Net Survey Results per TAILS: 03E15000-TA-2013-1152**

Dear Mr. Applegate:

Per your recommendation via letter dated July 23, 2013 (enclosed), a mist net survey was conducted during the summer of 2014 by Environmental Solutions & Innovations, Inc. (ESI) on a property located in the vicinity of 40.188862, -81.851809 in Franklin Township, Coshocton County, Ohio. The subject property consists of abandoned mine lands proposed for reclamation to eliminate hazardous highwalls and acid mine drainage from these areas. The goal of the reclamation is to restore the landscape back to its approximate contours and reforest the reclaimed land with vegetation native to the region. The proposed limits of disturbance, including clearing, will be approximately 109 acres divided into two areas; east and west reclamation phases.

As presented in the enclosed survey report, ESI conducted mist net surveys and portal searches within the proposed project areas per the USFWS 2014 *Range-wide Indiana Bat Summer Survey Guidelines*, Indiana Bat Recovery Team 2007 *Indiana Bat Draft Recovery Plan* (First Edition) Draft Survey Protocol, and USFWS 2014 *Northern Long-eared Bat Interim Conference and Planning Guidance*. The results of the mist net survey and portal searches are presented in the enclosed report. Based on the scope of the proposed reclamation project and survey results, we respectively request a recommendation for the timing of tree clearing.

If you have any questions or want to schedule a site visit, please contact me at 614-716-2240 or at jmmagalski@aep.com. We respectively request a response within 30 days of receipt so that we can remain on schedule to initiate the reclamation project during the summer of 2015. Thank you for your time and attention to this matter.

Sincerely,

Jonathan M. Magalski
Principal Environmental Specialist
American Electric Power Service Corporation

Enclosures

Cc: Ms. Jennifer Norris
Wildlife Research Biologist
Ohio Department of Natural Resources, Division of Wildlife
2045 Morse Road, Building G
Columbus, Ohio 43229-6693

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

December 23, 2014

American Electric Power
Attn: Jonathan Magalski
1 Riverside Plaza
Columbus, Ohio
43215-2373

TAILS# 03E15000-2013-TA-1152

Reference: AEP Generation Resources Inc. – Conesville Plant Survey Results

Dear Mr. Magalski,

LISTED SPECIES COMMENTS: We have received your Indiana bat (*Myotis sodalis*) summer survey report for the subject project. Surveys were conducted following current U.S. Fish and Wildlife Service (Service) guidelines for Indiana bat surveys. No Indiana bats were detected, demonstrating probable absence of Indiana bats in the project area. Tree clearing on the project site at any time of the year is unlikely to result in adverse impacts to the Indiana bat. Negative summer surveys for Indiana bats are valid for a minimum of two years. Therefore, **no tree clearing should occur on the site after March 31, 2017** without further coordination with this office.

If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), no tree clearing on any portion of the parcel should occur until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend that the federal action agency submit a determination of effects to this office, relative to the Indiana bat, for our review and concurrence.

PROPOSED SPECIES COMMENTS: While the survey results do not indicate the presence of the federally listed endangered Indiana bat within your project area, they do indicate that the **northern long-eared bat** (*Myotis septentrionalis*) is present. The northern long-eared bat is a species that is currently proposed for listing as federally endangered under the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). The final listing decision for the northern long-eared bat will occur no later than April 2, 2015. No critical habitat has been proposed at this time. Species proposed for listing are not afforded protection under the Endangered Species Act (ESA); however as soon as a listing becomes effective, the prohibition against jeopardizing its continued existence and "take" applies **regardless of an action's stage of completion.**

We understand that the proposed project would result in the cutting of trees this summer. This may cause injury or harm to the northern long-eared bat(s) that inhabit the area. However, at this