

III

RELEVANT EXCERPTS FROM

WETLAND DELINEATION REPORT

(see Appendix VIII for complete report)

- A. *Stream 4*
- B. *Stream 8*
- C. *Stream 12*

A

Stream 4

1. *Headwater Habitat Evaluation Index Form*
2. *Macroinvertebrate Sampling Data Sheets*
3. *Color Photographs and Photo Location Map*

STREAM 4

Stream 4 is a perennial tributary to Porters Run. Stream 4 is located approximately 2.6 river miles upstream from the confluence of Porters Run with Captina Creek. Stream 4 is about 8 feet wide, has variable banks about 1 to 2 feet high, and has a stream bottom consisting of cobble, gravel, and silt. The riparian areas on both sides of the stream are wide and support immature forest, shrub, or old field. Stream 4 received a Primary Headwater Habitat Evaluation Index score of 42, designating it with a rating of Rheocrene Perennial. This classification warranted macroinvertebrate evaluation by a Level 3 Qualified Data Collector; the macroinvertebrate data indicated Stream 4 was Class IIIA. See the HHEI form and Macroinvertebrate Sampling Data Sheets in **Appendix III, Attachment A**, for more information. Stream 4 was delineated in the field to be at least 125 linear feet in length; Stream 4 extended outside of the project study area.

Aquatic macroinvertebrates were observed during wetland identification and delineation (dobsonfly larvae, scuds, caddisfly larvae, and stonefly larvae) as well as sampled during the macroinvertebrate evaluation (mayflies, stoneflies, caddisflies, isopod crustaceans, scuds, and leeches). See the HHEI form and Macroinvertebrate Sampling Data Sheets in **Appendix III, Attachment A**, for more information. According to a letter from the Ohio Department of Natural Resources (ODNR) dated March 7, 2014, no rare, threatened, or endangered species occur within the project area. While state-endangered eastern hellbenders may occur in the area, they were not observed within Stream 8 and are not likely to be impacted according to ODNR (see **Appendix IV, Attachment C**).

There is one wetland impact associated with the Stream 4 crossing, and it is being evaluated by the USACE according to the Pre-Construction Notification (PCN) package included in **Appendix VIII**. The USACE has assumed jurisdiction over all aquatic resources delineated within the Wetland Delineation Report submitted as part of the PCN. The Preliminary JD is included as USACE correspondence, dated June 30, 2014, in **Appendix IV, Attachment A**.



Primary Headwater Habitat Evaluation Form

RHEOCRENE

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

42

SITE NAME/LOCATION BUCKEYE COMPRESSOR STATION DISCHARGE PIPELINE / SH UNT. TO PORTER'S RUN

SITE NUMBER _____ RIVER BASIN OHIO DRAINAGE AREA (mi²) <0.01

LENGTH OF STREAM REACH (ft) 200 LAT. 39.8511 LONG. 80.8552 RIVER CODE _____ RIVER MILE _____

DATE 12-19-2013 SCORER WZ COMMENTS _____

REV. 4-23-2014

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

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

MODIFICATIONS:

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
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	<u>50</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>5</u>	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>30</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>15</u>	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5 (A) 3 (B) 4

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

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 8

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

COMMENTS 1.25 + 1.25 + 2.5 + 1.5 = 6.5 ÷ 4 = AVERAGE BANKFULL WIDTH (meters) 1.6

HHEI Metric Points

Substrate Max = 40

7

A + B

Pool Depth Max = 30

15

Bankfull Width Max=30

20

This information must also be completed

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

- L R (Per Bank)
- Wide >10m
- Moderate 5-10m
- Narrow <5m
- None

- L R (Most Predominant per Bank)
- Mature Forest, Wetland
- Immature Forest, Shrub or Old Field
- Residential, Park, New Field
- Fenced Pasture

- L R
- Conservation Tillage
- Urban or Industrial
- Open Pasture, Row Crop
- 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 1 GPM

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)

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: CAPTINA CREEK Distance from Evaluated Stream APPROX. 2 MI.
 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: POWHATAN POINT NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: BELMONT Township / City: YORK

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: _____

Photograph Information: 9, 10, 11, 12 (12-19-2013), 13, 14 (12-13-2013)

Elevated Turbidity? (Y/N): N Canopy (% open): 10

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

Field Measures: Temp (°C) 6 Dissolved Oxygen (mg/l) N pH (S.U.) N Conductivity (µmhos/cm) N

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) Y Voucher? (Y/N) N

Comments Regarding Biology: HELGRAMMITE 4-23-'14 SCUDS, CADDIS, STONEFLY

VEG.: ASH, BLACK WILLOW, CHRISTMAS FERN, NORTHERN SPICEBUSH, JEWELWEED

S4 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

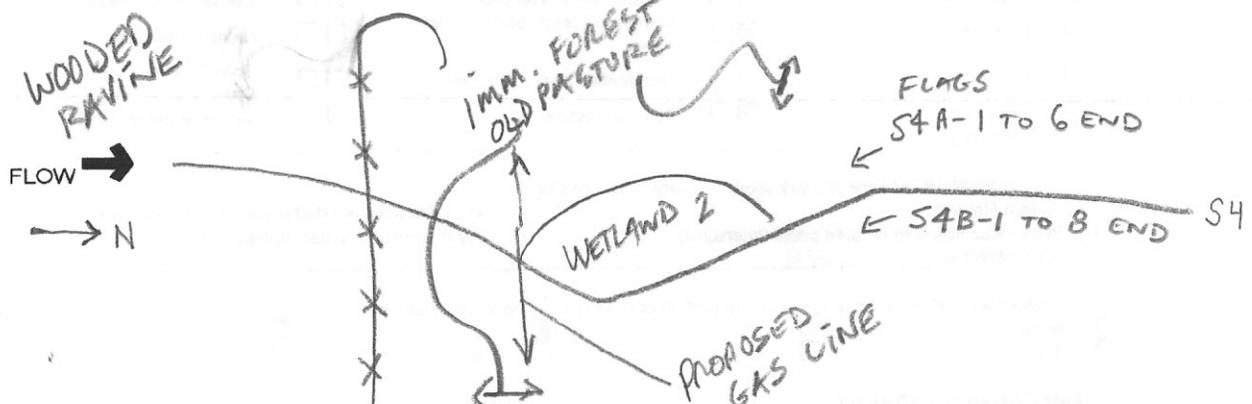


Table 1. Macroinvertebrate Sampling Data Sheets

Site: Stream 4 Sample Date: 5/6/2014

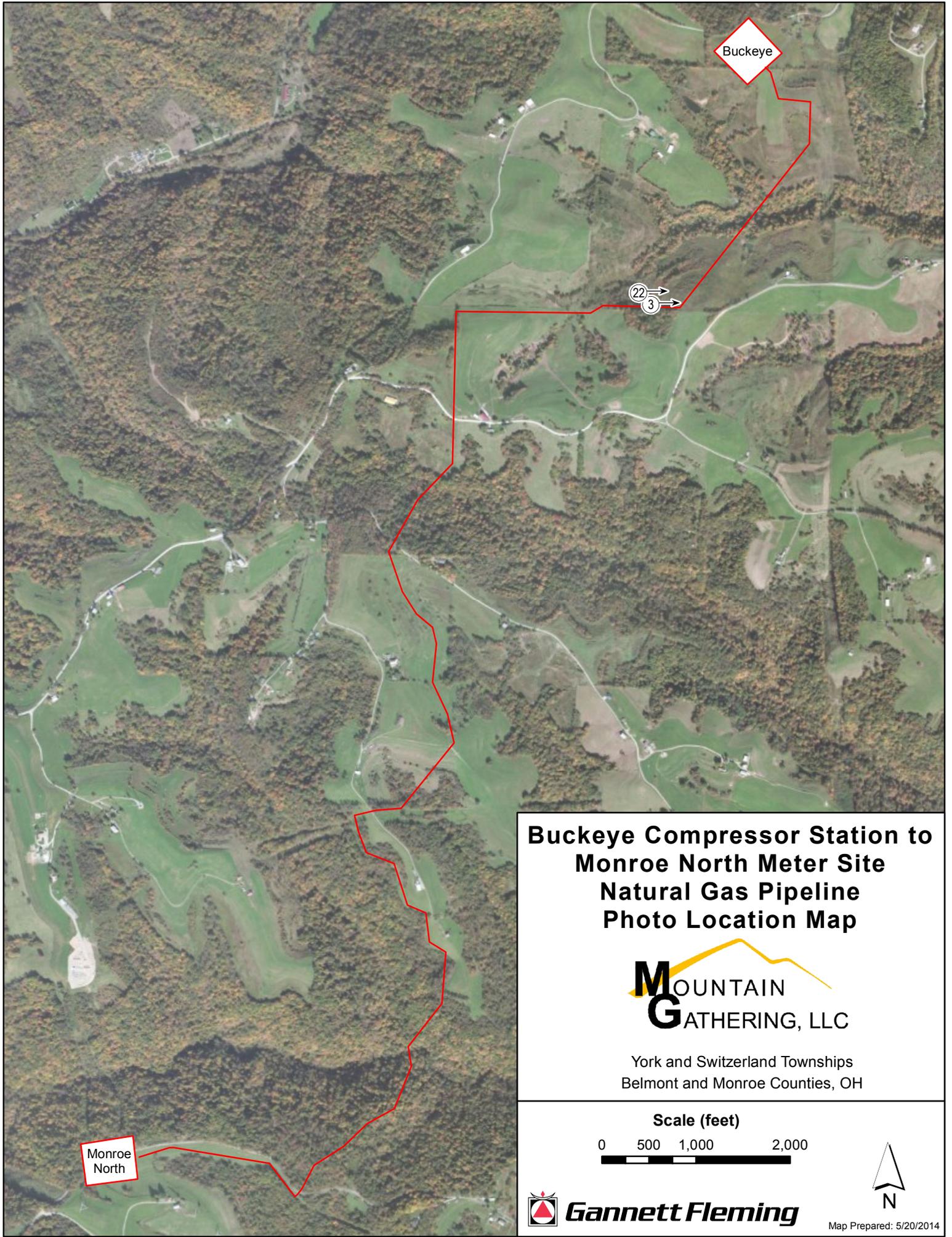
Taxonomic Group	Number of Individuals	Cold Water Taxa	Sensitive Taxa	EPT taxa
COLEOPTERA (beetles)				
Elmidae				
MEGALOPTERA (dobsonflies)				
<i>Nigronia</i> sp.				
DIPTERA (true flies)				
Chironomidae				
Dixidae				
<i>Dixa</i> sp.				
Tipulidae				
<i>Hexatoma</i> sp.				
<i>Pedicia</i> sp.				
<i>Tipula</i> sp.				
immature				
EPHEMEROPTERA (mayflies)				
Ameletidae				
<i>Ameletus</i> sp.				
Baetidae				
<i>Baetis</i> sp.				
Ephemerellidae				
<i>Ephemerella</i> sp.				
immature				
Heptageniidae				
<i>Epeorus</i> sp.	4		X	X
<i>Stenacron</i> sp.				
<i>Stenonema</i> sp.				
Leptophlebiidae				
<i>Habrophlebiodes</i> sp.				
immature				
PLECOPTERA (stoneflies)				
Chloroperlidae				
<i>Alloperla</i> sp.				
<i>Sweltsa</i> sp.	3		X	X
Leuctridae				
<i>Leuctra</i> sp.	2		X	X
immature				
Nemouridae				
<i>Amphinemura</i> sp.				
Perlidae				
<i>Acroneuria</i> sp.				
<i>Hansonoperla</i> sp.?				
Perlodidae				
<i>Isoperla</i> sp.				
<i>Malirekus iroquois</i>				
immature				

Table 1. Macroinvertebrate Sampling Data Sheets

Site: Stream 4 Sample Date: 5/6/2014

Taxonomic Group	Number of Individuals	Cold Water Taxa	Sensitive Taxa	EPT taxa
HEMIPTERA (true bugs)				
TRICHOPTERA (caddisflies)				
Hydropsychidae				
<i>Diplectrona</i> sp. immature	1		X	X
Limnephilidae				
<i>Ironoquia</i> sp.				
<i>Pycnopsyche</i> sp. immature				
Philopotamidae				
<i>Wormaldia</i> sp.				
Rhyacophilidae				
<i>Rhyacophila</i> sp.	3		X	X
Uenoidae				
<i>Neophylax</i> sp.	14			X
NON-INSECT TAXA				
Annelida				
Oligochaeta				
Asellidae				
<i>Caecidotea</i> sp.	7			
Cambaridae				
Gammaridae				
<i>Gammarus</i> sp.	7			
Hirudinea	11			
TOTAL	52	-	5	6

Table 1 Summary		
Cold Water Taxa (#)	5	% Chironomidae 0.00
Sensitive Taxa (#)	5	% Coleoptera 0.00
EPT Taxa (#)	6	% Ephemeroptera 7.69
Taxa Richness	9	% Plecoptera 9.62
% EPT	51.92	% Trichoptera 34.62



Buckeye

22
3

Monroe
North

Buckeye Compressor Station to Monroe North Meter Site Natural Gas Pipeline Photo Location Map



York and Switzerland Townships
Belmont and Monroe Counties, OH

Scale (feet)



Map Prepared: 5/20/2014

Data Source: Aerial Imagery Map provided by ESRI through ArcGIS Online webservice.



Photograph 3: Wetland 2 (PEM) Sampling Point SP-W2 was evaluated along Stream 4, in background (facing east; 12/13/2013)



Photograph 22: Stream 4 (UNT of Porters Run; Perennial Spring (Rheocrene Perennial); facing east; 12/13/2013)

B

Stream 8

- 1. Headwater Habitat Evaluation Index Form*
- 2. Macroinvertebrate Sampling Data Sheets*
- 3. Color Photographs and Photo Location Map*

STREAM 8

Stream 8 (Bearwallow Run) is a perennial tributary to Big Run (WWH, primary contact recreation). Stream 8 is located approximately 0.8 river miles upstream of the confluence of Big Run with the Ohio River. Stream 8 is about 8 feet wide, has variable banks about 2 to 4 feet high, and has a stream bottom consisting of cobble, gravel, and silt. The riparian areas on both sides of the stream are wide, steep, and support mature forest. Stream 8 received a Primary Headwater Habitat Evaluation Index score of 65, designating it with a rating of Class III Perennial. This classification warranted macroinvertebrate evaluation by a Level 3 Qualified Data Collector; the macroinvertebrate data indicated Stream 8 was Class IIIB. See the HHEI form and Macroinvertebrate Sampling Data Sheets in **Appendix III, Attachment B**, for more information. Stream 8 was delineated in the field to be at least 150 linear feet in length; Stream 8 extended outside of the project study area.

Aquatic macroinvertebrates and amphibians were observed during wetland identification and delineation (caddisfly larvae, mayfly larvae, stonefly larvae, leeches, northern two-lined salamanders, and northern dusky salamanders) and aquatic macroinvertebrate were sampled during the macroinvertebrate evaluation (dobsonflies, true flies, mayflies, stoneflies, caddisflies, crawfish, and scuds). See the HHEI form and Macroinvertebrate Sampling Data Sheets in **Appendix III, Attachment B**, for more information. According to a letter from the Ohio Department of Natural Resources (ODNR) dated March 7, 2014, no rare, threatened, or endangered species occur within the project area. While state-endangered eastern hellbenders may occur in the area, they were not observed within Stream 8 and are not likely to be impacted according to ODNR (see **Appendix IV, Attachment C**).

There are no wetland, lake, or pond impacts associated with the Stream 8 crossing. The USACE has assumed jurisdiction over all aquatic resources delineated within the Wetland Delineation Report submitted as part of the Pre-Construction Notification package, included in **Appendix VIII**. The Preliminary JD is included as USACE correspondence, dated June 30, 2014, in **Appendix IV, Attachment A**.



Primary Headwater Habitat Evaluation Form

CLASS III PWHH
PERENNIAL

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

65

SITE NAME/LOCATION BUCKEYE COMPRESSOR STATION DISCHARGE PIPELINE / S8 BEARWALLOW RUN

SITE NUMBER _____ RIVER BASIN OHIO DRAINAGE AREA (mi²) 0.09

LENGTH OF STREAM REACH (ft) 200 DECIMAL LAT. 39.8460 LONG. 80.8638 RIVER CODE _____ RIVER MILE _____

DATE 12-19-2013 SCORER WZ COMMENTS _____

REV. 4-23-2014

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

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

MODIFICATIONS:

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
<input type="checkbox"/> BLDR SLABS [16 pts]	-	<input type="checkbox"/> SILT [3 pt]	-
<input type="checkbox"/> BOULDER (>256 mm) [16 pts] ✓	1	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] ✓	5
<input type="checkbox"/> BEDROCK [16 pt]	-	<input type="checkbox"/> FINE DETRITUS [3 pts]	-
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts] ✓	10	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	-
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] ✓	49	<input type="checkbox"/> MUCK [0 pts]	-
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] ✓	35	<input type="checkbox"/> ARTIFICIAL [3 pts]	-

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 11 (A) **15** (B) **5**

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

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] 17	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): **17**

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

COMMENTS 2.8+2.5+2.9+2 = 10.2 ÷ 4 = 2.5 AVERAGE BANKFULL WIDTH (meters) **2.5**

↳ BASED ON DOWNSTREAM MEASUREMENTS FROM 4-23-14 (BELOW LOG JAM)

HHEI Metric Points

Substrate Max = 40

20

A + B

Pool Depth Max = 30

25

Bankfull Width Max=30

20

This information must also be completed

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

RIPARIAN WIDTH		FLOODPLAIN QUALITY			
L	R	L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wide >10m		Mature Forest, Wetland		Conservation Tillage	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moderate 5-10m		Immature Forest, Shrub or Old Field		Urban or Industrial	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Narrow <5m		Residential, Park, New Field		Open Pasture, Row Crop	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None		Fenced Pasture		Mining or Construction	

COMMENTS _____

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

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS ≈ 1 CFS

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

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 ft/100 ft)	<input type="checkbox"/> Flat to Moderate	<input checked="" type="checkbox"/> Moderate (2 ft/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> 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: BIG RUN Distance from Evaluated Stream APPROX. 1.5 MI.
 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: POWHATAN POINT NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: MONROE Township / City: SWITZERLAND

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: _____ Quantity: _____
Photograph Information: 24, 25, 26 (12-19-2013), 28, 30 (12-13-2013)
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) 4 Dissolved Oxygen (mg/l) N pH (S.U.) N Conductivity (µmhos/cm) N
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) Y Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Y Voucher? (Y/N) N

Comments Regarding Biology: DEAD GREEN FROG, MAYFLY, CADDIS 4-23-2014 Y
4-23-2014 Y
NORTHERN TWO-LINED SALAMANDER
NORTHERN DUSKY SALAMANDER

VEG.: BLACK CHERRY, SUGAR MAPLE, CHRISTMAS FERN

S8 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



VIRGINIA BLUE BELLS

Table 1. Macroinvertebrate Sampling Data Sheets

Site: Stream 8 Sample Date: 5/6/2014

Taxonomic Group	Number of Individuals	Cold Water Taxa	Sensitive Taxa	EPT Taxa
COLEOPTERA (beetles)				
Elmidae				
MEGALOPTERA (dobsonflies)				
<i>Nigronia</i> sp.	1			
DIPTERA (true flies)				
Chironomidae	1			
Dixidae				
<i>Dixa</i> sp.				
Tipulidae				
<i>Hexatoma</i> sp.				
<i>Pedicia</i> sp.				
<i>Tipula</i> sp.	1			
immature				
EPHEMEROPTERA (mayflies)				
Ameletidae				
<i>Ameletus</i> sp.	6	X	X	X
Baetidae				
<i>Baetis</i> sp.	2			X
Ephemerellidae				
<i>Ephemerella</i> sp.	6		X	X
immature				
Heptageniidae				
<i>Epeorus</i> sp.	23	X	X	X
<i>Stenacron</i> sp.	1			X
<i>Stenonema</i> sp.				
Leptophlebiidae				
<i>Habrophlebiodes</i> sp.	3	X	X	X
immature				
PLECOPTERA (stoneflies)				
Chloroperlidae				
<i>Alloperla</i> sp.	1		X	X
<i>Sweltsa</i> sp.	29	X	X	X
Leuctridae				
<i>Leuctra</i> sp.	3	X	X	X
immature				
Nemouridae				
<i>Amphinemura</i> sp.	16	X	X	X
Perlidae				
<i>Acroneuria</i> sp.				
<i>Hansonoperla</i> sp.?	1			X
Perlodidae				
<i>Isoperla</i> sp.	8		X	X
<i>Malirekus iroquois</i>				
immature				

Table 1. Macroinvertebrate Sampling Data Sheets

Site: Stream 8 Sample Date: 5/6/2014

Taxonomic Group	Number of Individuals	Cold Water Taxa	Sensitive Taxa	EPT Taxa
HEMIPTERA (true bugs)				
TRICHOPTERA (caddisflies)				
Hydropsychidae				
<i>Diplectrona</i> sp.	8	X		X
immature	6			
Limnephilidae				
<i>Ironoquia</i> sp.				
<i>Pycnopsyche</i> sp.	2		X	X
immature				
Philopotamidae				
<i>Wormaldia</i> sp.	1	X	X	X
Rhyacophilidae				
<i>Rhyacophila</i> sp.				
Uenoidae				
<i>Neophylax</i> sp.				
NON-INSECT TAXA				
Annelida				
Oligochaeta				
Asellidae				
<i>Caecidotea</i> sp.				
Cambaridae	4			
Gammaridae				
<i>Gammarus</i> sp.	35			
Hirudinea				
TOTAL	158	8	11	15

Cold Water Taxa (#)	8	% Chironomidae	0.63
Sensitive Taxa (#)	11	% Coleoptera	0.00
EPT Taxa (#)	15	% Ephemeroptera	25.95
Taxa Richness	20	% Plecoptera	36.71
% EPT	73.42	% Trichoptera	10.76



Buckeye

← 26

Monroe North

Buckeye Compressor Station to Monroe North Meter Site Natural Gas Pipeline Photo Location Map



York and Switzerland Townships
Belmont and Monroe Counties, OH

Scale (feet)



Map Prepared: 5/20/2014



Photograph 26: Stream 8 upstream view (Bearwallow Run; Perennial; facing west; 12/19/2013)

C

Stream 12

- 1. Headwater Habitat Evaluation Index Form*
- 2. Macroinvertebrate Sampling Data Sheets*
- 3. Color Photographs and Photo Location Map*

STREAM 12

Stream 12 is a perennial tributary to Big Run. Stream 12 is located approximately 2.0 river miles upstream from the confluence of Big Run with the Ohio River. Stream 12 is about 6 feet wide, has variable banks about 6 inches to 2 feet high, and has a stream bottom consisting of cobble, gravel, and silt. The riparian areas on both sides of the stream are wide and support mature forest. Stream 12 received a Primary Headwater Habitat Evaluation Index score of 42, designating it with a rating of Rheocrene Perennial. This classification warranted macroinvertebrate evaluation by a Level 3 Qualified Data Collector; the macroinvertebrate data indicated Stream 12 was Class IIIA. See the HHEI form and Macroinvertebrate Sampling Data Sheets in **Appendix III, Attachment C**, for more information. Stream 12 was delineated in the field to be at least 175 linear feet in length; Stream 12 extended outside of the project study area.

Aquatic macroinvertebrates and amphibians were observed during wetland identification and delineation (stonefly larvae, caddisfly larvae, and dead green frogs) and aquatic macroinvertebrates were sampled during the macroinvertebrate evaluation (true flies, stoneflies, true bugs, caddisflies, isopod crustaceans, crawfish, and scuds). See the HHEI form and Macroinvertebrate Sampling Data Sheets in **Appendix III, Attachment C**, for more information. According to a letter from the Ohio Department of Natural Resources (ODNR) dated March 7, 2014, no rare, threatened, or endangered species occur within the project area. While state-endangered eastern hellbenders may occur in the area, they were not observed within Stream 8 and are not likely to be impacted according to ODNR (see **Appendix IV, Attachment C**).

There are no wetland, lake, or pond impacts associated with the Stream 12 crossing. The USACE has assumed jurisdiction over all aquatic resources delineated within the Wetland Delineation Report submitted as part of the Pre-Construction Notification package, included in **Appendix VIII**. The Preliminary JD is included as USACE correspondence, dated June 30, 2014, in **Appendix IV, Attachment A**.



Primary Headwater Habitat Evaluation Form

RHEOCRENE

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

42

SITE NAME/LOCATION BUCKEYE COMPRESSOR STATION DISCHARGE PIPELINE / S12 UNT TO BIG RUN

SITE NUMBER _____ RIVER BASIN OHIO DRAINAGE AREA (mi²) 0.02

LENGTH OF STREAM REACH (ft) 200 LAT. 39°50'12.7535" N LONG. 80°51'53.3496" W RIVER CODE _____ RIVER MILE _____

DATE 3-17-2014 SCORER WRZ COMMENTS _____

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

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

MODIFICATIONS:

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
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	<u>65</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>1</u>	<input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	<u>9</u>
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>10</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>15</u>	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 11 (A) 12 (B) 5

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

HHEI Metric Points

Substrate Max = 40

17

A + B

Pool Depth Max = 30

5

Bankfull Width Max=30

20

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input checked="" type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS 4-23-2014 NO REAL POOLS (ALL RIFFLES/RUNS) MAXIMUM POOL DEPTH (centimeters): 4

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

COMMENTS 1.5 + 2 + 1 + 2.5 = 7 ÷ 4 = 1.75 AVERAGE BANKFULL WIDTH (meters) 1.75

This information must also be completed

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

RIPARIAN WIDTH		FLOODPLAIN QUALITY			
L	R	L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wide >10m		Mature Forest, Wetland		Conservation Tillage	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moderate 5-10m		Immature Forest, Shrub or Old Field		Urban or Industrial	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Narrow <5m		Residential, Park, New Field		Open Pasture, Row Crop	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None		Fenced Pasture		Mining or Construction	

COMMENTS _____

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

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

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

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input checked="" type="checkbox"/> >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: BIG RUN Distance from Evaluated Stream 1/2 mile
 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: POWHATAN POINT NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
 County: MONROE Township / City: SWITZERLAND

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 3-16-2014 Quantity: pm SNOW < 1"
 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) 3 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) Y Voucher? (Y/N) N
 Comments Regarding Biology: 4-23-2014 CADDIS 4-23-2014 DEAD GREEN FROG, STONEFLY

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

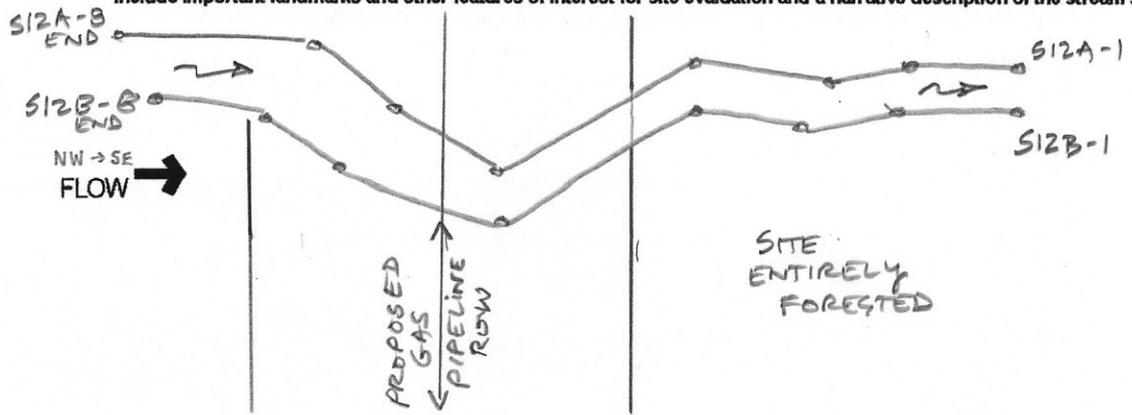


Table 1. Macroinvertebrate Sampling Data Sheets
 Site: Stream 12 Sample Date: 5/6/2014

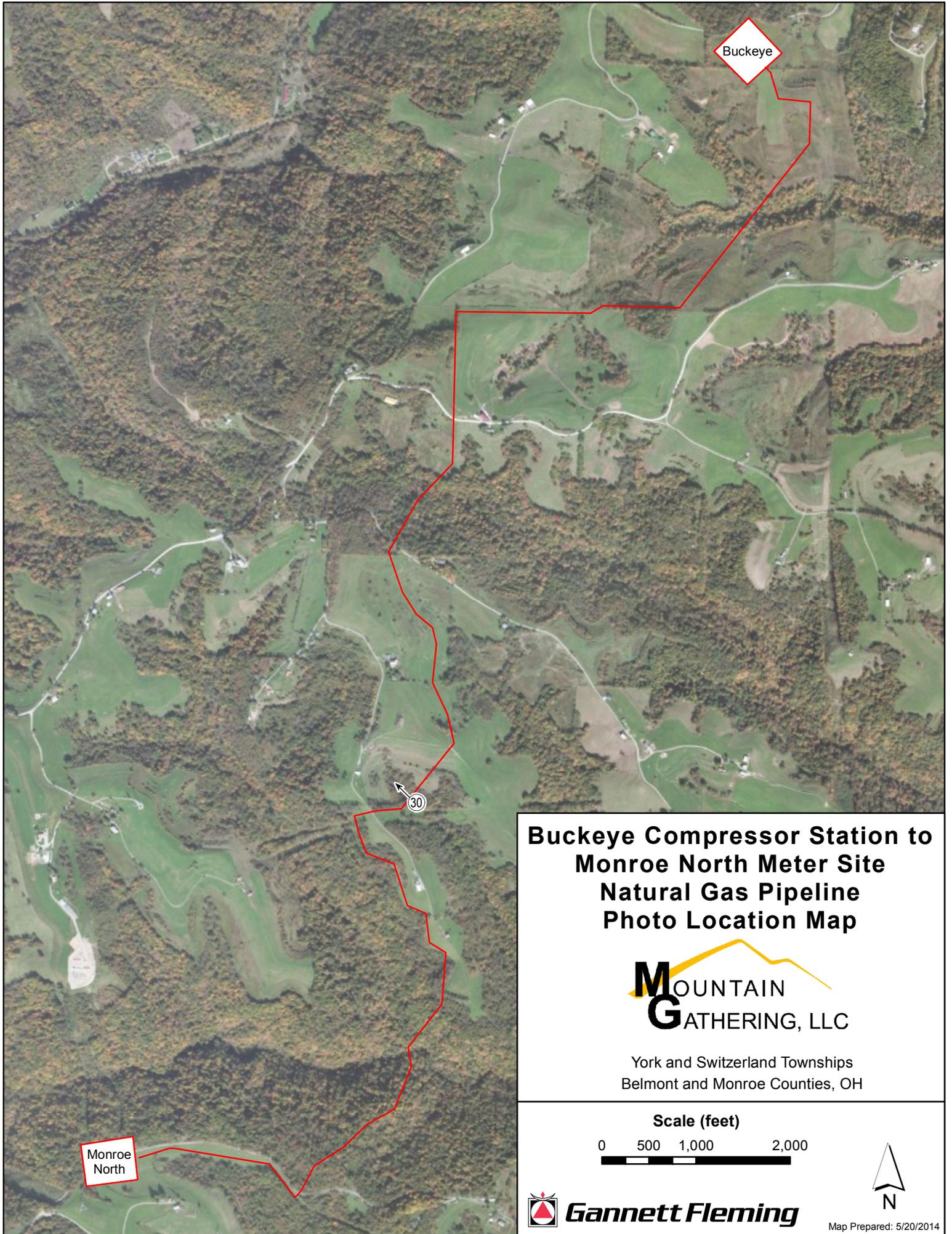
Taxonomic Group	Number of Individuals	Cold Water Taxa	Sensitive Taxa	EPT Taxa
COLEOPTERA (beetles)				
Elmidae				
MEGALOPTERA (dobsonflies)				
<i>Nigronia</i> sp.				
DIPTERA (true flies)				
Chironomidae	8			
Dixidae				
<i>Dixa</i> sp.	2			
Tipulidae				
<i>Hexatoma</i> sp.	1		X	
<i>Pedicia</i> sp.	1	X		
<i>Tipula</i> sp.	1			
immature	2			
EPHEMEROPTERA (mayflies)				
Ameletidae				
<i>Ameletus</i> sp.				
Baetidae				
<i>Baetis</i> sp.				
Ephemerellidae				
<i>Ephemerella</i> sp.				
immature				
Heptageniidae				
<i>Epeorus</i> sp.				
<i>Stenacron</i> sp.				
<i>Stenonema</i> sp.				
Leptophlebiidae				
<i>Habrophlebiodes</i> sp.				
immature				
PLECOPTERA (stoneflies)				
Chloroperlidae				
<i>Alloperla</i> sp.				
<i>Sweltsa</i> sp.				
Leuctridae				
<i>Leuctra</i> sp.				
immature				
Nemouridae				
<i>Amphinemura</i> sp.	3	X	X	X
Perlidae				
<i>Acroneuria</i> sp.				
<i>Hansonoperla</i> sp.?				
Perlodidae				
<i>Isoperla</i> sp.				
<i>Malirekus iroquois</i>				
immature				

Table 1. Macroinvertebrate Sampling Data Sheets

Site: Stream 12 Sample Date: 5/6/2014

Taxonomic Group	Number of Individuals	Cold Water Taxa	Sensitive Taxa	EPT Taxa
HEMIPTERA (true bugs)	2			
TRICHOPTERA (caddisflies)				
Hydropsychidae				
<i>Diplectrona</i> sp.	1	X		X
immature	1			
Limnephilidae				
<i>Ironoquia</i> sp.	3			X
<i>Pycnopsyche</i> sp.				
immature	2			
Philopotamidae				
<i>Wormaldia</i> sp.				
Rhyacophilidae				
<i>Rhyacophila</i> sp.	1	X	X	X
Uenoidae				
<i>Neophylax</i> sp.	2		X	X
NON-INSECT TAXA				
Annelida				
Oligochaeta				
Asellidae				
<i>Caecidotea</i> sp.	23			
Cambaridae	1			
Gammaridae				
<i>Gammarus</i> sp.	2			
Hirudinea				
TOTAL	56	4	4	5

Table 1 Summary		
Cold Water Taxa (#)	4	% Chironomidae 14.29
Sensitive Taxa (#)	4	% Coleoptera 0.00
EPT Taxa (#)	5	% Ephemeroptera 0.00
Taxa Richness	15	% Plecoptera 5.36
% EPT	23.21	% Trichoptera 17.86



Buckeye

Monroe North

30

Buckeye Compressor Station to Monroe North Meter Site Natural Gas Pipeline Photo Location Map



York and Switzerland Townships
Belmont and Monroe Counties, OH

Scale (feet)



Map Prepared: 5/20/2014

Data Source: Aerial Imagery Map provided by ESRI through ArcGIS Online webservice.



Photograph 30: Stream 12 (UNT of Big Run; Perennial; facing northwest; 3/17/2014)