ATTACHMENT B

STREAM FORMS

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 26

Stream 1, Modified Class 1

SITE NAME/LOCATION Good Hope - Harrison

SITE NUMBER HH-3/4/16-9 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 3/24/2016 SCORER PSR COMMENTS Intermittent 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:

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]	5
☐☐	BOULDER (>256 mm) [18 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	50	☐☐	CLAY or HARDPAN [0 pt]	
☐☑	GRAVEL (2-64 mm) [9 pts]	15	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]		☐☐	ARTIFICIAL [3 pts]	75

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 12 (B) 4

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

HHEI Metric Points — Substrate Max = 40: 16 (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): 24

Pool Depth Max = 30: 5

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): 3.0

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		FLOODPLAIN QUALITY		
L R	(Per Bank)	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 (1.5 ft/100 ft) ☐ Moderate to Severe ☑ Severe (4.0 ft/100 ft)

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

Stream 1, Modified Class 1

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 75

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

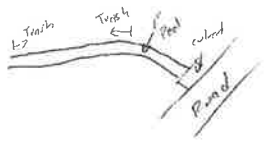
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____

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

FLOW →



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 77

Stream 2, Class 3

SITE NAME/LOCATION Good Hope - Harrison

SITE NUMBER HH-3/4/16-6 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 3/24/2016 SCORER PSR COMMENTS Intermittent 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:

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]	5
☐☐	BOULDER (>256 mm) [16 pts]	5	☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐☐	BEDROCK [16 pt]	20	☐☐	FINE DETRITUS [3 pts]	
☑☐	COBBLE (65-256 mm) [12 pts]	30	☐☐	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 (B) 6

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 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): 29

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): 7.0

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)	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 (1.5 ft/100 ft) ☑ Moderate to Severe ☐ Severe (4.0 ft/100 ft)

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

Stream 2, Class 3

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 35

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

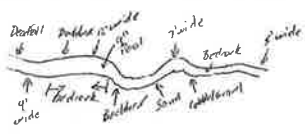
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____

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

FLOW →



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 60

Stream 3, Class 1

SITE NAME/LOCATION: Grand Ridge - Harrison

SITE NUMBER: HH-3/4/16-3 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/2 9/2016 SCORER: PSR COMMENTS: Ephemeral / Intermy

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]	60
☐	BEDROCK [16 pt]	1	☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-255 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	10	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 1 (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): 1.5

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [20 pts]
- ☐ > 3.0 m - 4.0 m (> 9'7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4'6" - 9'7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3'3" - 4'6") [15 pts]
- ☑ ≤ 1.0 m (≤ 3'3") [5 pts]

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): .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☆

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
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

- ☐ Flat (< 0.5 ft/mile)
- ☐ Flat to Moderate
- ☐ Moderate (0.5 - 1.0 ft/mile)
- ☐ Moderate to Severe
- ☑ Severe (> 2.0 ft/mile)

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

Stream 3, Class 1

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 90

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)

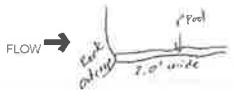
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 57

Stream 4, Modified Class 2

SITE NAME/LOCATION: Grand Ridge - Harrison

SITE NUMBER: HH-3/4/16-4 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/24/2016 SCORER: PSR 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]	5
☐	BOULDER (>256 mm) [16 pts]	5	☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐	BEDROCK [16 pt]	5	☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	30	☐	CLAY or HARDPAN [0 pt]	
☑	GRAVEL (2-64 mm) [9 pts]	40	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 40 (A): 21 (B): 6

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 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): 13

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [20 pts]
- ☐ > 3.0 m - 4.0 m (> 9'7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4'6" - 9'7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3'3" - 4'6") [15 pts]
- ☑ ≤ 1.0 m (≤ 3'3") [5 pts]

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): .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☆

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
- ☑ 0.5
- ☐ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

- ☐ Flat (< 0.5 ft/mile)
- ☐ Flat to Moderate
- ☐ Moderate (0.5 - 1.0 ft/mile)
- ☐ Moderate to Severe
- ☑ Severe (> 2.0 ft/mile)

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

Stream 4, Modified Class 2

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 70

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)

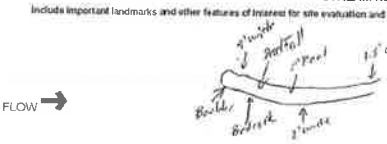
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 19

Stream 5, Modified Class 1

SITE NAME/LOCATION: Good Hope - Harrison

SITE NUMBER: HH-3/25/16-1 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT.: _____ LONG.: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/25/16 SCORER: PSR COMMENTS: Ephemeral stream

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]	10
☐	BOULDER (>256 mm) [16 pts]		☑	LEAF PACK/WOODY DEBRIS [3 pts]	25
☐	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]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 10 (A): 6 (B): 3

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

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): 1

Pool Depth Max = 30: 5

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): 1.5

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
- ☐ 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)

PHWH Form Page - 1

June 29, 2001 Revision

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

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

Stream 5, Modified Class 1

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 3/24/2016 Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 70

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

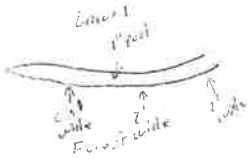
Frogs or Tadpoles Observed? (Y/N) ____ Voucher? (Y/N) ____ Aquatic Macroinvertebrates Observed? (Y/N) ____ Voucher? (Y/N) ____

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

FLOW ➜



PHWH Form Page - 2

June 29, 2001 Revision

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 53

Stream 6, Class 2

SITE NAME/LOCATION: Good Hope - Harrison

SITE NUMBER: HH-3/25/16-2 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT.: _____ LONG.: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/25/2016 SCORER: PSR 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]	
☐	BOULDER (>256 mm) [16 pts]	15	☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☑	BEDROCK [16 pt]	45	☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	30	☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	5	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	5	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 90 (A): 28 (B): 1

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

HHEI Metric Points: Substrate Max = 40: 33 — 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): 12

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): 1.5

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
- ☐ 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)

PHWH Form Page - 1

June 29, 2001 Revision

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

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

Stream 6, Class 2

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 3/24/2016 Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): Y 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: _____

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

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

FLOW ➜

PHWH Form Page - 2

June 29, 2001 Revision

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 66

Stream 7, Modified Class 2

SITE NAME/LOCATION: Good Hope - Hartford

SITE NUMBER HH-Strib-7 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 3/25/2016 SCORER PSR COMMENTS Ephemeral Stream

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 6 (A): 15 (B): 6

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

HHEI Metric Points — Substrate Max = 40: 21 (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

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): 1.5 ft

Bankfull Width Max=30: 2.0

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 (2.1-4.0 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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 3/24/2016 Quantity _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N 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 (umhos/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) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

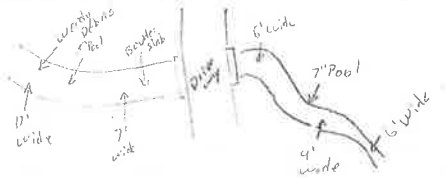
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____

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

FLOW →



Ohio EPA Primary Headwater Habitat Evaluation Form

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

Stream 8, Class 1

SITE NAME/LOCATION: Good Hope - Hartford

SITE NUMBER HH-Strib-8 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 3/25/2016 SCORER PSR COMMENTS Ephemeral Stream

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]	5
☐	BOULDER (>256 mm) [16 pts]		☑	LEAF PACK/WOODY DEBRIS [3 pts]	50
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	5	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0 (A): 6 (B): 3

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

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): 1.2 ft

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 (2.1-4.0 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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 3/24/2016 Quantity _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 30

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 (umhos/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) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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

FLOW →

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 19

Stream 9, Modified Class 1

SITE NAME/LOCATION: Good Hope - Harrison

SITE NUMBER: HH-3/2/16 - 5 RIVER BASIN: _____ DRAINAGE AREA (m²): _____

LENGTH OF STREAM REACH (ft): _____ LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/2/2016 SCORER: PJR COMMENTS: Extremely steep

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:

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 pts]	10
☐	BOULDER (>256 mm) [16 pts]		☑	LEAF PACK/WOODY DEBRIS [3 pts]	85
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	5	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bdr Slabs, Boulder, Cobble, Bedrock: 0 (A) 6 (B) 3

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

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]

Pool Depth Max = 30: 5

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 1 ft. — 1

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 - 4.0m (> 9'7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0m (> 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]

Bankfull Width Max=30: 5

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): 1.5 ft. — 2.5

PHWH Form Page - 1

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
- ☐ 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 (0.5-1.0 ft/100 ft)
- ☐ Moderate to Severe
- ☑ Severe (> 2.0 ft/100 ft)

PHWH Form Page - 1

Stream 9, Modified Class 1

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 3/24/2016 Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 60

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 (umhos/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)

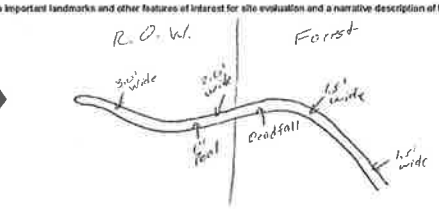
Fish Observed? (Y/N): _____ Voucher? (Y/N): _____ Salamanders Observed? (Y/N): _____ Voucher? (Y/N): _____

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



PHWH Form Page - 2

Stream & Location: 2H-1-3 K- 3/2/16 1 Good Hope-Harrison RM: ___ Date: 3/2/2016

Stream 10 - Excellent Scorers Full Name & Affiliation: Philip Romer, ECOM

River Code: - - STORET #: /8 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present. Check ONE (Or 2 & average)

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]	5	15	☐ ☐ DETRITUS [3]		
☑ ☐ COBBLE [8]	80	65	☐ ☐ MUCK [2]		
☐ ☑ GRAVEL [7]	15	20	☐ ☐ SILT [2]		
☐ ☐ SAND [6]	20	5	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]			(Score natural substrates; ignore		

NUMBER OF BEST TYPES: ☑ 4 or more [2] ☐ 3 or less [0]

ORIGIN	QUALITY	
☐ LIMESTONE [1]	☐ HEAVY [-2]	
☑ TILLS [1]	☐ MODERATE [-1]	
☐ WETLANDS [0]	☑ NORMAL [0]	
☐ HARDPAN [0]	☐ FREE [1]	
☐ SANDSTONE [0]	☐ EXTENSIVE [-2]	
☐ RIPRAP [0]	☐ MODERATE [-1]	
☐ LACUSTURINE [0]	☑ NORMAL [0]	
☐ SHALE [-1]	☐ NONE [1]	
☐ COAL FINES [-2]		

SILT / EMBEDDEDNESS

Substrate 15 — Maximum 20

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent, 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]	
1 OVERHANGING VEGETATION [1]	2 ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]	
___ SHALLOWS (IN SLOW WATER) [1]	3 BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]	
___ ROOTMATS [1]			

AMOUNT — Check ONE (Or 2 & average)

- ☐ EXTENSIVE >75% [11]
- ☑ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Cover Maximum 20: 14

Comments

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☑ EXCELLENT [7]	☑ NONE [6]	☑ HIGH [3]
☑ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☐ RECOVERING [2]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Channel Maximum 20: 19

Comments

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average). River right looking downstream

EROSION L	R	RIPARIAN WIDTH L	R	FLOOD PLAIN QUALITY L	R
☐	☐	NONE / LITTLE [3]	☐	☐	WIDE > 80m [4]	☑	☐	FOREST, SWAMP [3]	☐	☐	CONSERVATION TILLAGE [1]
☑	☐	MODERATE [2]	☐	☐	MODERATE 10-80m [3]	☐	☐	SHRUB OR OLD FIELD [2]	☐	☐	URBAN OR INDUSTRIAL [0]
☑	☑	HEAVY / SEVERE [1]	☐	☐	NARROW 5-10m [2]	☐	☐	RESIDENTIAL, PARK, NEW FIELD [1]	☐	☐	MINING / CONSTRUCTION [0]
			☐	☐	VERY NARROW < 5m [1]	☐	☐	FENCED PASTURE [1]			
			☐	☐	NONE [0]	☐	☐	OPEN PASTURE, ROWCROP [0]			

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10: 8

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY))
- ☑ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average))
- ☑ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH > RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply)
- ☐ TORRENTIAL [-1]
- ☑ SLOW [1]
- ☐ VERY FAST [1]
- ☐ INTERSTITIAL [-1]
- ☑ FAST [1]
- ☐ INTERMITTENT [-2]
- ☑ MODERATE [1]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Pool / Current Maximum 12: 11

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☑ BEST AREAS > 10cm [2]	☑ MAXIMUM > 50cm [2]	☑ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☑ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Riffle / Run Maximum 8: 7

Comments

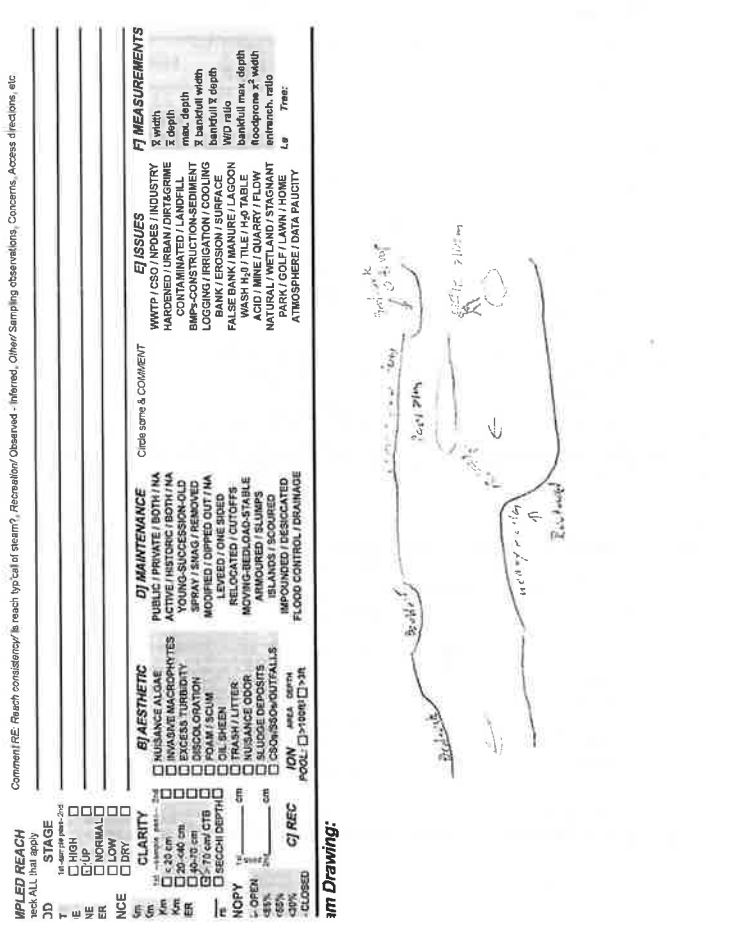
6) GRADIENT 12 ft/mi ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (91.09 mi²) %POOL: ___ %GLIDE: ___ %RUN: ___ %RIFFLE: ___

Gradient Maximum 10: 4

EPA 4520 05/15/06

Stream 10 - Excellent



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 39

Stream 11, Modified Class 2

SITE NAME/LOCATION _____

SITE NUMBER HH-SR11R-C RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 3/25/2016 SCORER ESR COMMENTS Perennial Stream

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]	
☐	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]	5	☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	35	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0 (A) 6 (B) 3

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

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): 17

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): 2.1

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 (Intermittent)
- ☐ 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 to Extremely Flat
- ☐ Flat to Moderate
- ☑ Moderate (2 ft/mile)
- ☐ Moderate to Severe
- ☐ Severe (40 ft/mile)

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 3/24/2016 Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 75

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

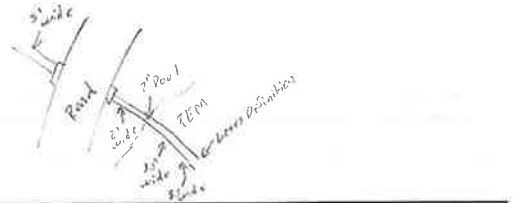
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

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

FLOW →



Report Name: Stream 12 | Modified Class II

HH-MDT-033016-09

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 61

SITE NAME/LOCATION Unnamed Tributary to Hoover

HH-MDT-033016-09 SITE NUMBER 09 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE _____ SCORER ESR/TMD COMMENTS Intermittent

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

Pipeline / Trans ROW

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]	10
☐	BEDROCK [16 pt]	5	☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	10	☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	25	☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	30	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 15 (A) 15 (B) 6

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

HHEI Metric Points: Substrate Max = 40 → 21; 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

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): 1.5

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 (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 (Intermittent)
- ☐ 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 to Extremely Flat
- ☐ Flat to Moderate
- ☐ Moderate (2 ft/mile)
- ☒ Moderate to Severe
- ☐ Severe (40 ft/mile)

Report Name: Stream 12 | Modified Class II

HH-MDT-033016-09

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 3/24/2016 Quantity: _____

Photograph Information: 1 - Looking Upstream, 2 - Downstream

Elevated Turbidity? (Y/N): N Canopy (% open): 30

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: N/A

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

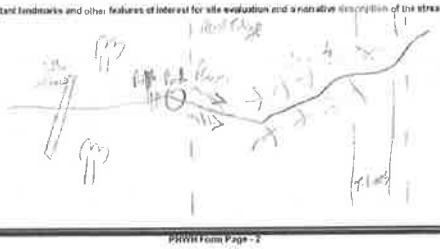
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

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

FLOW →



Report Name: Stream 13 | Modified Class II

HH-MDT-033016-07 3/30/16

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 49

SITE NAME/LOCATION: Grand Rapids - Waterville

HH-MDT-033016-07 SITE NUMBER 07 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 03/30/2016 SCORER MDT, BLK 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: some disturbance from pipeline

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 pts]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	10	☐	CLAY or HARDPAN [0 pts]	
☒	GRAVEL (2-64 mm) [9 pts]	50	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	30	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10 (A) 15

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points — Substrate Max = 40: 19 — 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):

- ☐ > 50 centimeters [20 pts]
- ☐ > 22.5 - 50 cm [10 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) 19.5

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) feet 1.5

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	
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 Subsurface

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 (< 5 ft/100 ft)
- ☐ Flat to Moderate
- ☒ Moderate (5 ft/100 ft)
- ☐ Moderate to Severe
- ☐ Severe (> 10 ft/100 ft)

PHWH Form Page - 1

Report Name: Stream 13 | Modified Class II

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: Hocking Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation 3/27/16 Quantity Unknown

Photograph Information: 2

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) _____ 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

PHWH Form Page - 2

Report Name: Stream 14 | Modified Class II

HH-MDT-033016-07

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 51

SITE NAME/LOCATION: Grand Rapids - Waterville

HH-MDT-033016-07 SITE NUMBER 07 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 03/30/16 SCORER MDT/BLK COMMENTS Downstream

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: Pipeline ROW

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 pts]	15
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐	BEDROCK [16 pts]	8	☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	30	☐	CLAY or HARDPAN [0 pts]	
☒	GRAVEL (2-64 mm) [9 pts]	25	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	25	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 25 (A) 15

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 6 (B)

HHEI Metric Points — Substrate Max = 40: 21 — 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):

- ☐ > 50 centimeters [20 pts]
- ☐ > 22.5 - 50 cm [10 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) Unsure 18

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 - 4.0m (> 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 (Below) feet 2.5

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	
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 (< 5 ft/100 ft)
- ☐ Flat to Moderate
- ☐ Moderate (5 ft/100 ft)
- ☒ Moderate to Severe
- ☐ Severe (> 10 ft/100 ft)

PHWH Form Page - 1

Report Name: Stream 14 | Modified Class II

HH-MDT-033016-07

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/28/16 Quantity _____

Photograph Information: 2 Photos, Upstream + Downstream

Elevated Turbidity? (Y/N) N 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: N/A

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)

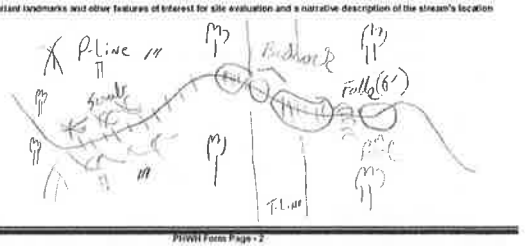
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

Report Name: Stream 15 | Modified Class II

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 41.0

SITE NAME/LOCATION: [illegible] SITE NUMBER: 06 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): 200ft LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 10 Nov 2016 SCORER: MDT, BLK COMMENTS: Intermittent

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: stream channel loses definition through pasture ROW

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 pts]	20
☐☐	BOULDER (>256 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐☐	BEDROCK [16 pts]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	10	☐☐	CLAY or HARDPAN [0 pt]	
☒☐	GRAVEL (2-64 mm) [8 pts]	45	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 10 (A) 14 (B) 5

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

HHEI Metric Points — Substrate Max = 40: 20 — 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 [10 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☒ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth Max = 30: 15

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 13

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 — 5

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 (Intermittent)
- ☐ 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 meter/km)
- ☐ Flat to Moderate
- ☐ Moderate (0.5 - 1.5 m/km)
- ☒ Moderate to Severe
- ☐ Severe (> 2.0 m/km)

PHWH Form Page - 1

Report Name: Stream 15 | Modified Class II

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: [illegible] Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 3/29/16 Quantity: Unknown

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 30

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 (umhos/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)

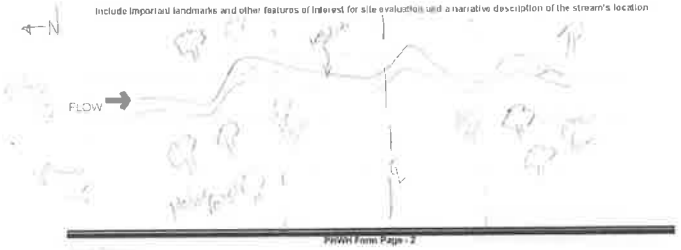
Fish Observed? (Y/N): N Voucher? (Y/N): ___ Salamanders Observed? (Y/N): N Voucher? (Y/N): ___

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



PHWH Form Page - 2

Report Name: Stream 16 | Class III

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 54

SITE NAME/LOCATION: [illegible] SITE NUMBER: _____ RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): 200ft LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 10 Nov 2016 SCORER: MDT, BLK COMMENTS: Intermittent

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:

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]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	20	☐☐	CLAY or HARDPAN [0 pt]	
☒☐	GRAVEL (2-64 mm) [8 pts]	40	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]	15	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 20 (A) (B) 4

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

HHEI Metric Points — Substrate Max = 40: 19 — 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 [10 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth Max = 30: 30

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 12

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): 0.9 — 5

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 (Intermittent)
- ☐ 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 meter/km)
- ☒ Flat to Moderate
- ☐ Moderate (0.5 - 1.5 m/km)
- ☐ Moderate to Severe
- ☐ Severe (> 2.0 m/km)

PHWH Form Page - 1

Report Name: Stream 16 | Class III

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: [illegible] Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 3/29/16 Quantity: Unknown

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 (umhos/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): ___ 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

PHWH Form Page - 2

Report Name: Stream 17 | Modified Class I

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 23

SITE NAME/LOCATION: [illegible] SITE NUMBER 04 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 30 Mar 2016 SCORER MDT, MDC COMMENTS Ephemeral

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: Prior impacts from pipeline construction

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 pts]	30
☐☐ BOULDER (>256 mm) [16 pts]		☐☐ LEAF PACK/WOODY DEBRIS [3 pts]	10
☐☐ BEDROCK [16 pts]		☐☐ FINE DETRITUS [3 pts]	
☐☐ COBBLE (65-256 mm) [12 pts]		☐☐ CLAY or HARDPAN [0 pts]	
☐☐ GRAVEL (2-64 mm) [8 pts]	20	☐☐ MUCK [0 pts]	
☒☐ SAND (<2 mm) [6 pts]	10	☐☐ ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0 (A) 9 (B) 7

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

HHEI Metric Points — Substrate Max = 40: 18 (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): 5

Pool Depth Max = 30: 5

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 (est)

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 Ephemeral

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 to 0.2 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (0.2 to 0.6 ft/100 ft) ☐ Moderate to Severe ☐ Severe (>2.4 ft/100 ft)

PHWH Form Page - 1

Report Name: Stream 17 | Modified Class I

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: Harding Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 3/22/16 Quantity: .04

Photograph Information: 2 up/d

Elevated Turbidity? (Y/N) N Canopy (% open) 90

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

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

PHWH Form Page - 2

Report Name: Stream 18 | Modified Class II

HH-MDT-033016-03

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 34

SITE NAME/LOCATION: Pipeline ROW - Headwater

HH-MDT-033016-03 SITE NUMBER 03 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT _____ LONG _____ RIVER CODE _____ RIVER MILE _____

DATE 30 Mar 2016 SCORER MDT, MDC COMMENTS Ephemeral

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: Pipeline ROW

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 pts]	40
☐☐ BOULDER (>256 mm) [16 pts]		☐☐ LEAF PACK/WOODY DEBRIS [3 pts]	5
☐☐ BEDROCK [16 pts]		☐☐ FINE DETRITUS [3 pts]	
☐☐ COBBLE (65-256 mm) [12 pts]	5	☐☐ CLAY or HARDPAN [0 pts]	
☐☐ GRAVEL (2-64 mm) [8 pts]	15	☐☐ MUCK [0 pts]	
☒☐ SAND (<2 mm) [6 pts]	10	☐☐ ARTIFICIAL [3 pts]	

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

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

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): Undefined

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 (est)

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
- ☐ 0.5
- ☒ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0 to 0.2 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (0.2 to 0.6 ft/100 ft) ☒ Moderate to Severe ☐ Severe (>2.4 ft/100 ft)

PHWH Form Page - 1

Report Name: Stream 18 | Modified Class II

HH-MDT-033016-03

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 3/22/16 Quantity: ?

Photograph Information: 2 Photos, Upstream + Downstream

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) _____ 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 N/A

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)

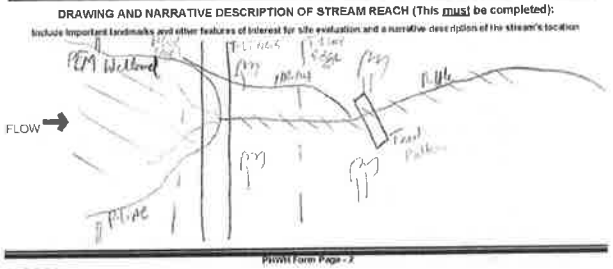
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

Report Name: Stream 19 | Modified Class II

HH-MDT-033016-02

OhioEPA Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION: [illegible] - Upstream

HH-MDT-033016-02 SITE NUMBER 02 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 150ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/30/16 SCORER [illegible] COMMENTS Ephemeral

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

Pipeline / Tranmis. ROW

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]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	15	☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [8 pts]	25	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	40	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 15 (A) → 10 (B) → 5

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

HHEI Metric Points: Substrate Max = 40 → 20; 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 [10 pts]
- ☐ > 10 - 22.5 cm [5 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☒ ≤ 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

Broke 2.5

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 2.5

Pool Depth Max = 30 → 5

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]

Est 1.5

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 1.5

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 (Intermittent)
- ☐ 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 ft/mile) ☐ Flat to Moderate ☐ Moderate (10-40 ft/mile) ☐ Moderate to Severe ☒ Severe (>40 ft/mile)

PHWH Form Page - 1

Report Name: Stream 19 | Modified Class II

HH-MDT-033016-02

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/29/16 Quantity ?

Photograph Information 2 Photos, Upstream + Downstream

Elevated Turbidity? (Y/N) N Canopy (% open) 50

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 (umhos/cm) _____

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

Additional comments/description of pollution impacts: N/A

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

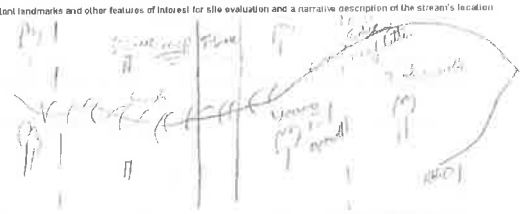
Frogs or Tadpoles Observed? (Y/N) ____ Voucher? (Y/N) ____ Aquatic Macroinvertebrates Observed? (Y/N) ____ Voucher? (Y/N) ____

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

FLOW →



PHWH Form Page - 2

Report Name: Stream 20 | Modified Class II

HH-MDT-033016-01

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 33

SITE NAME/LOCATION: [illegible] - Upstream

HH-MDT-033016-01 SITE NUMBER 01 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 150ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/30/16 SCORER MDT/OEPA COMMENTS Ephemeral

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

Pipeline ROW

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]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☒	COBBLE (65-256 mm) [12 pts]	30	☐	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) → 18 (B) → 5

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

HHEI Metric Points: Substrate Max = 40 → 23; 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 [10 pts]
- ☐ > 10 - 22.5 cm [5 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☒ ≤ 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

Broke 1.7

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 1.7

Pool Depth Max = 30 → 5

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]

Est 1.5

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 1.5

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 (Intermittent)
- ☐ 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 ft/mile) ☐ Flat to Moderate ☐ Moderate (10-40 ft/mile) ☐ Moderate to Severe ☒ Severe (>40 ft/mile)

PHWH Form Page - 1

Report Name: Stream 20 | Modified Class II

HH-MDT-033016-01

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/29/16 Quantity _____

Photograph Information 2 Photos, Upstream + Downstream

Elevated Turbidity? (Y/N) N Canopy (% open) 60

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 (umhos/cm) _____

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

Additional comments/description of pollution impacts: N/A

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

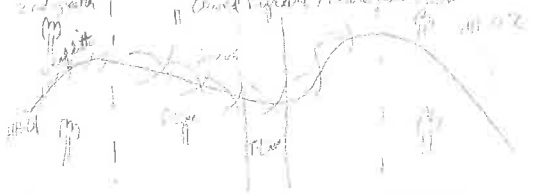
Frogs or Tadpoles Observed? (Y/N) ____ Voucher? (Y/N) ____ Aquatic Macroinvertebrates Observed? (Y/N) ____ Voucher? (Y/N) ____

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

FLOW →



PHWH Form Page - 2

Stream 21, Modified Class 1

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 15

SITE NAME/LOCATION: HW D - ETHRIDGE RD - TRIBUTARY
HH-MDT-32516-3 SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____
LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____
DATE 03/25/16 SCORER MDT/CMS COMMENTS Ephemeral

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
Culverted

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]	60
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	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]	20
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 3 (B) 7
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: _____ TOTAL NUMBER OF SUBSTRATE TYPES: _____

HHEI Metric Points: Substrate Max = 40 → 5; A + B → 7

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 [10 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 2" MAXIMUM POOL DEPTH (centimeters): 2"

Pool Depth Max = 30 → 5

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 Rect AVERAGE BANKFULL WIDTH (meters): 1.5'

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	
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 (4 ft/100 ft)

PHWH Form Page - 1

Stream 21, Modified Class 1

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____
County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation 3/25/16 Quantity _____
Photograph Information 2
Elevated Turbidity? (Y/N) N Canopy (% open) 70%
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 (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) _____ 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 _____

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

WETLAND
RUN
FLOW
POND

PHWH Form Page - 2

Stream 22, Modified Class 1

HH-MDT-32516-2

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 16

SITE NAME/LOCATION: HW B - ETHRIDGE RD - CULVERTED
HH-MDT-32516-2 SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____
LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____
DATE 3/25/16 SCORER MDT/CMS COMMENTS Intermittent

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
CULVERTED

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]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☒	FINE DETRITUS [3 pts]	60
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	30
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 3 (B) 3
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: _____ TOTAL NUMBER OF SUBSTRATE TYPES: _____

HHEI Metric Points: Substrate Max = 40 → 6; A + B → 6

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 [10 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): 2"

Pool Depth Max = 30 → 5

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'

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	
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 (4 ft/100 ft)

PHWH Form Page - 1

Stream 22, Modified Class 1

HH-MDT-32516-2

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____
County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation 3/25/16 Quantity _____
Photograph Information 2
Elevated Turbidity? (Y/N) N Canopy (% open) 80%
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 (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) _____ 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 _____

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

POND
ROW
FLOW
CULVERT
FORESTED
WETLAND
33% RIFFLE
RUN
POOL
FORESTED
ROW

PHWH Form Page - 2

Stream 23, Modified Class 2

HH-MDT-032516-01

Ohio EPA Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION: MDT HHPI 2011 - ROUTE 23 NB

HH-MDT-325116-1 SITE NUMBER 01 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 3/25/16 SCORER CMS, MDT COMMENTS TNI/RIGHT OF WAY

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]	60
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	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]	30	☐	ARTIFICIAL [3 pts]	

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

(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)

☐ > 50 centimeters [20 pts]	☒ > 5 cm - 10 cm [15 pts]
☐ > 22.5 - 50 cm [30 pts]	☐ < 5 cm [5 pts]
☐ > 10 - 22.5 cm [25 pts]	☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: Undue MAXIMUM POOL DEPTH (centimeters): 11"

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

COMMENTS: Acct AVERAGE BANKFULL WIDTH (meters): 1.5

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 ☐ 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 (2.1-4.0 ft/100 ft) ☐ Moderate to Severe ☐ Severe (>4.0 ft/100 ft)

Stream 23, Modified Class 2

HH-MDT-032516-01

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation 3/24/16 Quantity _____

Photograph Information: 2

Elevated Turbidity? (Y/N) N Canopy (% open): 70 %

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) No (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)

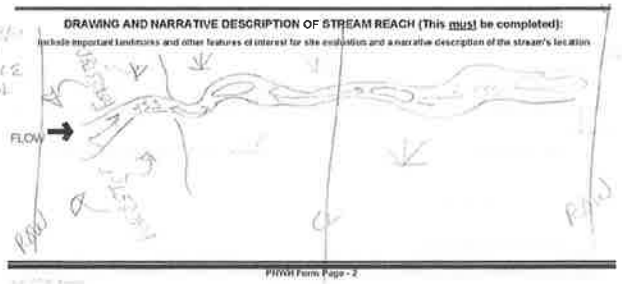
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N

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



Stream 24 - Modified Class 1

HH-MDT-032616-02

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 23

SITE NAME/LOCATION: Scioto Huge - Hyderson

HH-MDT-032616-02 SITE NUMBER 02 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 03/28/16 SCORER CMS, MDT COMMENTS Cleared

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

Pipeline Construction + within trans. ROW

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]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	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]	40	☐	ARTIFICIAL [3 pts]	

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

(B) 4

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

HHEI Metric Points — Substrate Max = 40: 13 — 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)

☐ > 50 centimeters [20 pts]	☐ > 5 cm - 10 cm [15 pts]
☐ > 22.5 - 50 cm [30 pts]	☒ < 5 cm [5 pts]
☐ > 10 - 22.5 cm [25 pts]	☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: Undue MAXIMUM POOL DEPTH (centimeters): 1"

Pool Depth Max = 30: 5

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

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

COMMENTS: Acct AVERAGE BANKFULL WIDTH (meters): 1'

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: Pipeline ROW recently maintained

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 (2.1-4.0 ft/100 ft) ☒ Moderate to Severe ☐ Severe (>4.0 ft/100 ft)

Stream 24 - Modified Class 1

HH-MDT-032616-02

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/28/16 (Early AM) Quantity ?

Photograph Information: 2 Photos, Upstream + Downstream

Elevated Turbidity? (Y/N) N Canopy (% open): 50

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: N/A

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)

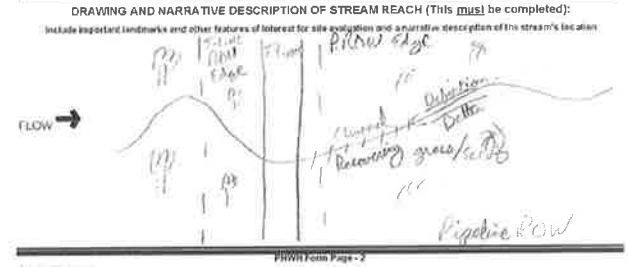
Fish Observed? (Y/N) ____ Voucher? (Y/N) ____ Salamanders Observed? (Y/N) ____ Voucher? (Y/N) ____

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



Stream 25 - Modified Class I

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 23

SITE NAME/LOCATION: Grand Rapids - Wauseon
HH-MDT-032816-01 SITE NUMBER: 01 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____
LENGTH OF STREAM REACH (ft): 200ft LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____
DATE: 03/28/16 SCORER: MDR COMMENTS: Sunny

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: Trans / Pipeline ROW construction

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 pts]	40
☐	BOULDER (>255 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-255 mm) [12 pts]	2	☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	18	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	40	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 2 (A) 4 (B) 4 — A + B: 13

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):

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

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 5

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

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

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): Best 1.5 → 5

HHEI Metric Points: Substrate Max = 40: 13; A + B; Pool Depth Max = 30: 5; 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: Pipeline ROW recently maintained

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

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

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 Severity) ☐ Flat to Moderate ☐ Moderate (1 Severity) ☒ Moderate to Severe ☐ Severe (2 Severity)

PHWH Form Page - 1

Stream25 - Modified Class I

HH-MDT-032816-01

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: _____ Township / City: _____

MISCELLANEOUS

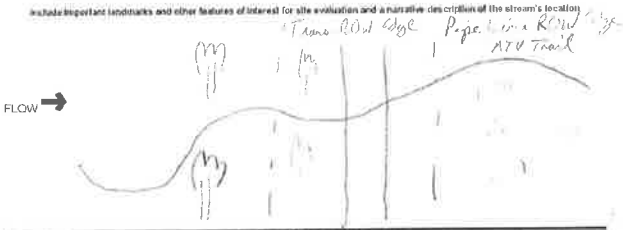
Base Flow Conditions? (Y/N): N Date of last precipitation: 3/27/16 (early AM) Quantity: ?
Photograph Information: 2 Photos, Upstream + Downstream
Elevated Turbidity? (Y/N): N Canopy (% open): 35%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or Id. and attach results) Lab Number: _____
Field Measures: Temp (°C): _____ Dissolved Oxygen (mg/l): _____ pH (S.U.): _____ Conductivity (umhos/cm): _____
Is the sampling reach representative of the stream (Y/N): Y If not, please explain: _____
Additional comments/description of pollution impacts: N/A

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



PHWH Form Page - 2

Stream 26 - Modified Class 1

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 27

SITE NAME/LOCATION: _____
Grand Rapids SITE NUMBER: 02 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____
LENGTH OF STREAM REACH (ft): 1500 LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____
DATE: 28 Mar 2016 SCORER: MDR, BLE COMMENTS: Sunny

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: Trans / Pipeline ROW

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 pts]	40
☐	BOULDER (>255 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-255 mm) [12 pts]	5	☐	CLAY or HARDPAN [0 pt]	
☒	GRAVEL (2-64 mm) [9 pts]	25	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	20	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 12 (B) 5 — A + B: 17

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):

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

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 5

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

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

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): Best 1.5 → 5

HHEI Metric Points: Substrate Max = 40: 17; A + B; Pool Depth Max = 30: 5; 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: Hill + slope to ROW, wood, also clearing in ROW

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

☒ Stream Flowing ☐ Moist Channel, Isolated pools, no flow (Intermittent)
☐ Subsurface flow with isolated pools (Interstitial) ☐ 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 Severity) ☐ Flat to Moderate ☐ Moderate (1 Severity) ☒ Moderate to Severe ☐ Severe (2 Severity)

PHWH Form Page - 1

Stream 26 - Modified Class 1

HH-MDT-032816-02

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: _____ Township / City: _____

MISCELLANEOUS

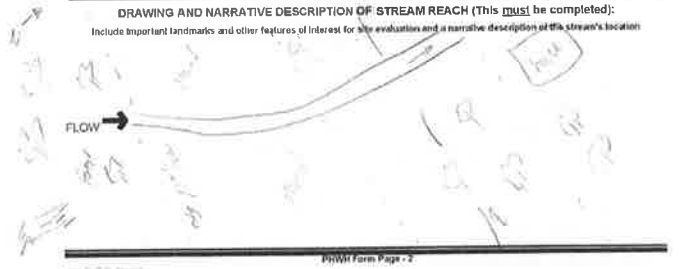
Base Flow Conditions? (Y/N): N Date of last precipitation: 3/27/16 Quantity: Moderate
Photograph Information: 1
Elevated Turbidity? (Y/N): N Canopy (% open): 80
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or Id. and attach results) Lab Number: _____
Field Measures: Temp (°C): _____ Dissolved Oxygen (mg/l): _____ pH (S.U.): _____ Conductivity (umhos/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): _____ 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



PHWH Form Page - 2

Stream 27 - Modified Class 1

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 44

SITE NAME/LOCATION: [illegible] Road Type / Access

HH-MDT-032816-06 SITE NUMBER 06 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 70 feet LAT _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 28 Mar 16 SCORER MDT, BEC COMMENTS Ephemeral

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: past disturbance from pipeline construction

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]	10
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	20	☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [8 pts]	15	☐☐	MUCK [0 pts]	
☒☐	SAND (<2 mm) [6 pts]	10	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 20 (A) 9 (B) _____

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

HHEI Metric Points — Substrate Max = 40: 11 — 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 [20 pts]
- ☐ > 15 - 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: 5

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 - 4.0m (> 9'7" - 13') [25 pts]
- ☐ > 1.5m - 3.0m (> 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): Est 1'

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 (Intermittent)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS Ephemeral

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 Riffles) ☐ Flat to Moderate ☐ Moderate (1 Riffle) ☒ Moderate to Severe ☐ Severe (>1 Riffle)

PHWH Form Page - 1

Stream 27 - Modified Class 1

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation: 3/11 Quantity: Unk

Photograph Information 2

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 _____

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)

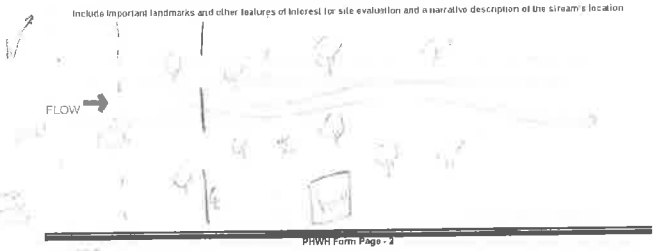
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) N Voucher? (Y/N) _____

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



PHWH Form Page - 2

Stream 28 - Modified Class 1

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 24

SITE NAME/LOCATION: Road Type / Access

HH-MDT-032816-06 SITE NUMBER 06 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 112 LAT _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 28/3/16 SCORER MDT/BEC COMMENTS Ephemeral

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: Pipeline ROW at toe

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]	5
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	5	☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [8 pts]	10	☐☐	MUCK [0 pts]	
☒☐	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	

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

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

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 [20 pts]
- ☐ > 15 - 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): 0.5

Pool Depth Max = 30: 5

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 - 4.0m (> 9'7" - 13') [25 pts]
- ☐ > 1.5m - 3.0m (> 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): Est 1'

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 (Intermittent)
- ☐ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS Recent Drying event

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 Riffles) ☐ Flat to Moderate ☐ Moderate (1 Riffle) ☐ Moderate to Severe ☒ Severe (>1 Riffle)

PHWH Form Page - 1

Stream 28 - Modified Class 1

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/23/16 (Early AM) Quantity ? Heavy

Photograph Information 2 Pipeline upstream Downstream

Elevated Turbidity? (Y/N) N Canopy (% open) 90

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 N/A

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)

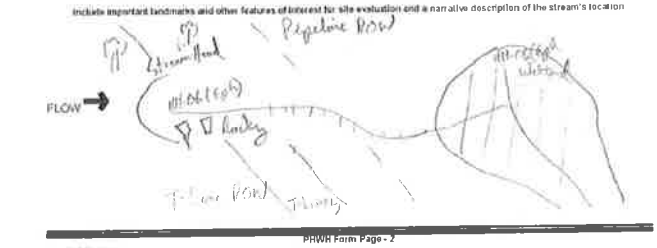
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

Stream 29 - Modified Class 2

HH-MDT-032816-05

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 34

SITE NAME/LOCATION: Good Hope - Hamilton

HH-MDT-032816-05 SITE NUMBER 05 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 150ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/28/16 SCORER MDTARCE COMMENTS Ephemeral

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 — Pipeline ROW

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]	35
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	5	☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	15	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	40	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 9

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

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): 4"

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): feet 2'

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: Pipeline ROW recently mowed

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: Recent heavy rain

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 meters) ☐ Flat to Moderate ☐ Moderate (2.4 meters) ☒ Moderate to Severe ☐ Severe (4.8 meters)

PHWH Form Page - 1

Stream 29 - Modified Class 2

HH-MDT-032816-05

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation: 03/23/16 (Early AM) Quantity: ?

Photograph Information: 4 Photos, Upstream (2) + Downstream (2)

Elevated Turbidity? (Y/N): N Canopy (% open): 35

Were samples collected for water chemistry? (Y/N): N (table 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: N/A

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)

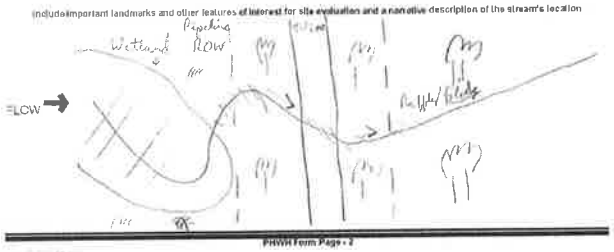
Fish Observed? (Y/N)____ Voucher? (Y/N)____ Salamanders Observed? (Y/N)____ Voucher? (Y/N)____

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



PHWH Form Page - 2

Stream 30 - Modified Class 1

HH-MDT-032816-04

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 24

SITE NAME/LOCATION: Good Hope - Hamilton

HH-MDT-032816-04 SITE NUMBER 04 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 150ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/28/16 SCORER MDTARCE COMMENTS Ephemeral

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 — Pipeline ROW

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 9

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

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): Shallow 2"

Pool Depth Max = 30: 5

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): feet 2'

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: Pipeline ROW

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 meters) ☐ Flat to Moderate ☐ Moderate (2.4 meters) ☒ Moderate to Severe ☐ Severe (4.8 meters)

PHWH Form Page - 1

Stream 30 - Modified Class 1

HH-MDT-032816-04

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation: 03/28/16 (Early AM) Quantity: ?

Photograph Information: 4 Photos, Upstream (2) + Downstream (2)

Elevated Turbidity? (Y/N): N Canopy (% open): 35

Were samples collected for water chemistry? (Y/N): N (table 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: N/A

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)

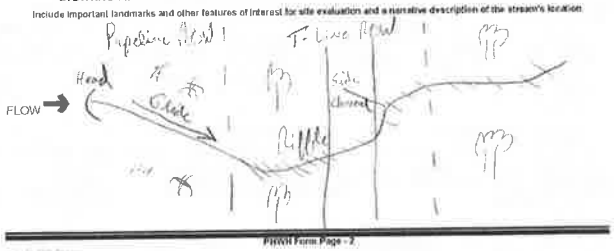
Fish Observed? (Y/N)____ Voucher? (Y/N)____ Salamanders Observed? (Y/N)____ Voucher? (Y/N)____

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



PHWH Form Page - 2

Stream 31 - Modified Class 2

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 42

SITE NAME/LOCATION: Tributary to Good Hope Run

SITE NUMBER: 03 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT.: _____ LONG.: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 28 Nov 16 SCORER: MDT, BCR COMMENTS: Intermittent

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

one spot of channelizing along field edge

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]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]		☐☐	CLAY or HARDPAN [3 pt]	
☐☐	GRAVEL (2-64 mm) [9 pts]	70	☐☐	MUCK [0 pts]	
☒☐	SAND (<2 mm) [6 pts]	30	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 7 (B) 5

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

HHEI Metric Points — Substrate Max = 40: 13 (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):

- ☐ > 70 centimeters [20 pts]
- ☐ > 40 - 70 cm [15 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ > 22.5 - 40 cm [10 pts]
- ☐ ≤ 5 cm [5 pts]
- ☒ > 10 - 22.5 cm [75 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 4

Pool Depth Max = 30: 4

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

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

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): 1

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
Wide >10m	☒	☐	Mature Forest, Wetland	☐	☐
Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☒	☐
Narrow <5m	☐	☒	Residential, Park, New Field	☐	☒
None	☐	☐	Fenced Pasture	☐	☐
			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: _____

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 ☒ Flat to Moderate ☐ Moderate ☐ Moderate to Severe ☐ Severe

PHWH Form Page - 1

Stream 31 - Modified Class 2

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 24/11/16 Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 100

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. on 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 sources: _____

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 (see the Primary Headwater Habitat Assessment Manual).)

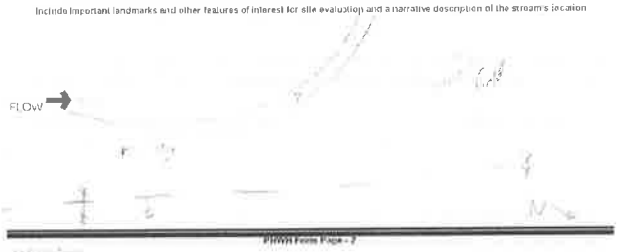
Fish Observed? (Y/N): N Voucher? (Y/N) _____ Salamanders Observed? (Y/N): N Voucher? (Y/N) _____

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



PHWH Form Page - 2

Stream 32-Fair

Ohio EPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 44.5

Fair Narrowater DO NOT [illegible]

Stream & Location: N/F Good Hope Runnion RM: ____ Date: 03/28/16

Scorers Full Name & Affiliation: Alcorn

River Code: - - STORET #: Lat / Long: (NAD 83 decimal) I8 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES, estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	____	____	☐☐ HARDPAN [4]	____	____
☐☐ BOULDER [9]	____	____	☐☐ DETRITUS [3]	____	____
☒☐ COBBLE [8]	40	30	☐☐ MUCK [2]	____	____
☒☐ GRAVEL [7]	40	50	☐☐ SILT [2]	____	5
☐☐ SAND [6]	20	15	☐☐ ARTIFICIAL [0]	____	____
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments: 15

Check ONE (Or 2 & average)

ORIGIN	QUALITY	
☐ LIMESTONE [1]	☐ HEAVY [-2]	Substrate
☐ TILLS [1]	☐ MODERATE [-1]	
☐ WETLANDS [0]	SILT ☒ NORMAL [0]	
☐ HARDPAN [0]	☐ FREE [1]	13
☒ SANDSTONE [0]	EMBEDDEDNESS ☒ EXTENSIVE [-2]	
☐ RIPRAP [0]	☐ MODERATE [-1]	Maximum 20
☐ LACUSTURINE [0]	☐ NORMAL [0]	
☐ SHALE [-1]	☐ NONE [1]	
☐ COAL FINES [-2]		

0 -2

2) INSTREAM COVER Indicate presence 0 to 3. 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

			AMOUNT (Check ONE (Or 2 & average))
____ UNDERCUT BANKS [1]	____ POOLS > 70cm [2]	____ OXBOWS, BACKWATERS [1]	☐ EXTENSIVE >75% [11]
____ OVERHANGING VEGETATION [1]	____ ROOTWADS [1]	____ AQUATIC MACROPHYTES [1]	☐ MODERATE 25-75% [7]
____ SHALLOWS (IN SLOW WATER) [1]	____ BOULDERS [1]	____ LOGS OR WOODY DEBRIS [1]	☐ SPARSE 5-25% [3]
____ ROOTMATS [1]			☒ NEARLY ABSENT <5% [1]

Cover Maximum 20: 1

Comments: Sandy eroded banks, leaves + log majority of riparian

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☒ GOOD [5]	☒ RECOVERED [4]	☐ MODERATE [2]
☒ LOW [2]	☐ FAIR [3]	☒ RECOVERING [3]	☒ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Channel Maximum 20: 11.5

Comments: 2 5 3.5 1

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average) (River right looking downstream)

EROSION L	EROSION R	RIPARIAN WIDTH L	RIPARIAN WIDTH R	FLOOD PLAIN QUALITY L	FLOOD PLAIN QUALITY R
☐ NONE / LITTLE [3]	☐	☐ WIDE > 50m [4]	☐	☐ FOREST, SWAMP [3]	☐
☐ MODERATE [2]	☐	☐ MODERATE 10-50m [3]	☐	☐ SHRUB OR OLD FIELD [2]	☐
☒ HEAVY / SEVERE [1]	☒	☒ NARROW 5-10m [2]	☐	☒ RESIDENTIAL, PARK, NEW FIELD [1]	☐
		☒ VERY NARROW < 5m [1]	☒	☐ FENCED PASTURE [1]	☐
		☐ NONE [0]	☐	☒ OPEN PASTURE, ROWCROP [0]	☐
				☐ CONSERVATION TILLAGE [1]	☐
				☐ URBAN OR INDUSTRIAL [0]	☐
				☐ MINING / CONSTRUCTION [0]	☐

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10: 3

Comments: 1 1.5 3.5

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY)

- ☐ > 1m [6]
- ☒ 0.7 - <1m [4]
- ☐ 0.4 - <0.7m [2]
- ☐ 0.2 - <0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☒ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☒ FAST [1]
- ☐ MODERATE [1]
- ☐ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current Maximum 12: 6

Comments: MD = 3' 11 1

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☒ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☒ MAXIMUM < 50cm [1]	☒ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☒ MODERATE [0] ☐ EXTENSIVE [-1]

Riffle / Run Maximum 8: 4

Comments: 2 1 0

6) GRADIENT 3.5 ft/mi) ☐ VERY LOW - LOW [3-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (1.99 mi²)

%POOL: 70 %GLIDE: 20 %RUN: 10 %RIFFLE: 0

Gradient Maximum 10: 6

EPA 4320 06/16/06

Stream 32-Fair

A) SAMPLED REACH Check ALL that apply

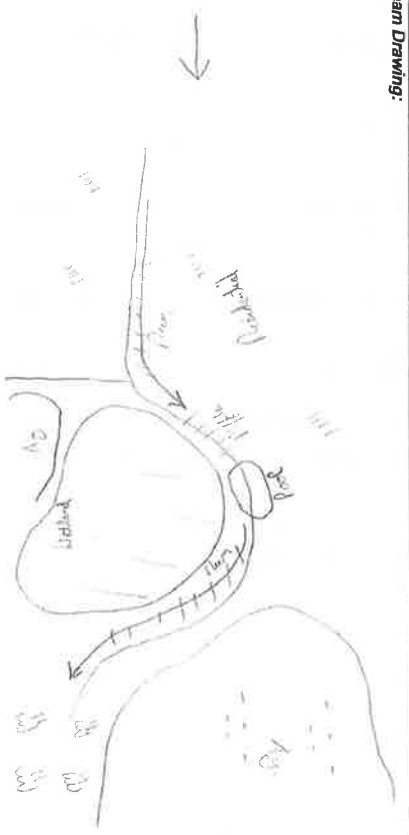
METHOD: ☐ BOAT ☐ WADE ☒ BANK

STAGE: ☐ HIGH ☒ NORMAL ☐ LOW ☐ DRY

DISTANCE: ☐ 0.5 Km ☐ 0.2 Km ☐ 0.15 Km ☐ OTHER

CLARITY: ☐ UP ☐ NORMAL ☐ LOW ☐ DRY

Stream Drawing:



C) REC CANOPY: ☐ > 85% - OPEN ☒ 55% - 85% ☐ 30% - 55% ☐ 10% - 30% ☐ < 10% - CLOSED

SECCHI DEPTH: ☐☐☐ cm

D) AESTHETIC ☐ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CROSSOVER/OUTFALLS

E) MAINTENANCE PUBLIC / PRIVATE / BOTH / NA ACTIVE / HISTORIC / BOTH / NA YOUNG-SUCCESSION-OLD MODIFIED / DIPPED OUT / NA SPRAY / SNAG / REMOVED LEVEED / ONE SIDED RELOCATED / CUT-0'S CONCRETE-RIP-RAP-STABLE ISLANDS / SCOURED IMPOUNDED / DESICCATED FLOOD CONTROL / DRAINAGE

F) ISSUES WWTP / CSO / NPDES / INDUSTRY HARDENED / URBAN / DIRT/GRIME CONTAMINATED / LANDFILL BMPs - CONSTRUCTION-SEDIMENT LOGGING / IRRIGATION / COOLING BANK-LEVEE/ROD SURFACE FALSE BANK / MANURE / LAGOON ACID / MINE / QUARRY / FLOW NATURAL / WETLAND / STAGNANT PARK / GOLF / LAWN / HOME ATMOSPHERE / DATA *BLUCITY

G) MEASUREMENTS 3 width 2 depth max. depth 2 bankfull width bankfull depth WID ratio bankfull max. depth floodprone 2* width entrench. ratio

Tree:

Comment RE: Reach consistency/Is reach typical of steam?, Recreation/ Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc

Stream 33 - Modified Class 2

HH-MDT-032816-15

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 41

SITE NAME/LOCATION: Good Hope - Hanover

HH-MDT-032816-15 SITE NUMBER 15 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 400ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/28/16 SCORER MDT/DCR COMMENTS Ephemeral

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: Within T-Line ROW / Residential lot

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 pts]	25
☐ BOULDER (>256 mm) [16 pts]		☐ LEAF PACK/WOODY DEBRIS [3 pts]	5
☐ BEDROCK [16 pts]	5	☐ FINE DETRITUS [3 pts]	
☐ COBBLE (65-256 mm) [12 pts]	10	☐ CLAY or HARDPAN [0 pts]	
☐ ☒ GRAVEL (2-64 mm) [9 pts]	30	☐ MUCK [0 pts]	
☒ ☐ SAND (<2 mm) [6 pts]	30	☐ ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 15 (A) 15 (B) 6

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

HHEI Metric Points: Substrate Max = 40 → 21; 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]

Pool Depth Max = 30 → 15

COMMENTS Muddy MAXIMUM POOL DEPTH (centimeters): 37

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]
- ☐ > 1.6 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 Bat AVERAGE BANKFULL WIDTH (meters): 2.1

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	
☐	☐	Wide >10m	☐	☐ Mature Forest, Wetland
☐	☒	Moderate 5-10m	☒	☒ Immature Forest, Shrub or Old Field
☒	☐	Narrow <5m	☒	☐ Residential, Park, New Field
☐	☐	None	☐	☐ 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 Heavy rains overnight

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 (no substrate) ☐ Flat to Moderate ☒ Moderate (2 to 10 ft/mi) ☐ Moderate to Severe ☐ Severe (>40 ft/mi)

PHWH Form Page - 1

HH-MDT-032816-15

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 03/22/16 (Early AM) Quantity: ?

Photograph Information: 2 Photos, Upstream + Downstream

Elevated Turbidity? (Y/N): N Canopy (% open): 40

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: N/A

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)

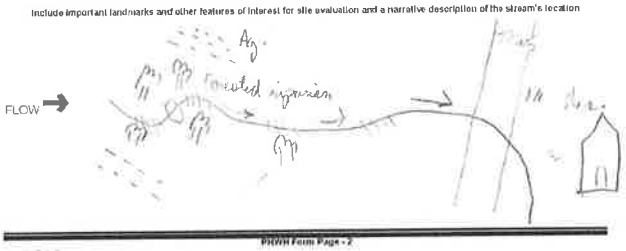
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

Stream 34 - Modified Class 2

HH-MDT-032816-14

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 30

SITE NAME/LOCATION: Good Hope - Hanover

HH-MDT-032816-14 SITE NUMBER 14 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 150ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/28/16 SCORER MDT/DCR COMMENTS Ephemeral

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: Within transmission line ROW

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 pts]	15
☐ BOULDER (>256 mm) [16 pts]		☐ LEAF PACK/WOODY DEBRIS [3 pts]	10
☐ BEDROCK [16 pts]		☐ FINE DETRITUS [3 pts]	
☐ COBBLE (65-256 mm) [12 pts]	5	☐ CLAY or HARDPAN [0 pts]	
☐ ☒ GRAVEL (2-64 mm) [9 pts]	30	☐ MUCK [0 pts]	
☒ ☐ SAND (<2 mm) [6 pts]	40	☐ ARTIFICIAL [3 pts]	

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

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

HHEI Metric Points: Substrate Max = 40 → 20; 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]

Pool Depth Max = 30 → 5

COMMENTS MAXIMUM POOL DEPTH (centimeters): 1"

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]
- ☐ > 1.6 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 Bed AVERAGE BANKFULL WIDTH (meters): 1.5

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	
☒	☒	Wide >10m	☐	☐ Mature Forest, Wetland
☐	☐	Moderate 5-10m	☒	☒ Immature Forest, Shrub or Old Field
☐	☐	Narrow <5m	☒	☒ Residential, Park, New Field
☐	☐	None	☐	☐ 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 Recent heavy rain

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 (no substrate) ☐ Flat to Moderate ☐ Moderate (2 to 10 ft/mi) ☒ Moderate to Severe ☐ Severe (>40 ft/mi)

PHWH Form Page - 1

HH-MDT-032816-14

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 03/22/16 (Early AM) Quantity: ?

Photograph Information: 2 Photos, Upstream + Downstream

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: N/A

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)

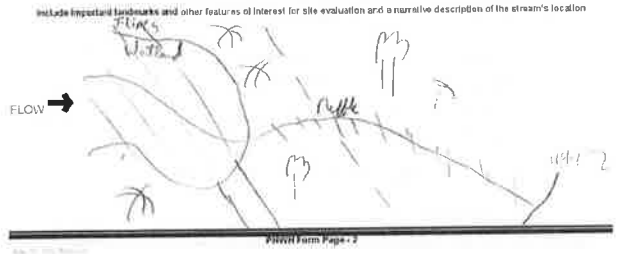
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

Stream 35 - Modified Class 2

HH-MDT-032816-12

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 61

SITE NAME/LOCATION ____

HH-MDT-032816-12 SITE NUMBER 12 RIVER BASIN ____ DRAINAGE AREA (mi²) ____

LENGTH OF STREAM REACH (ft) 400 ft LAT. ____ LONG. ____ RIVER CODE ____ RIVER MILE ____

DATE 03/28/16 SCORER MDT/BCR COMMENTS Intermittent

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
Within T-Line ROW

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]	10
☐☐	BOULDER (>256 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐☐	BEDROCK [16 pt]	5	☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	20	☐☐	CLAY or HARDPAN [0 pt]	
☐☒	GRAVEL (2-64 mm) [9 pts]	25	☐☐	MUCK [0 pts]	
☒☐	SAND (<2 mm) [6 pts]	30	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 25

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 15

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 6

HHEI Metric Points — Substrate Max = 40: 21 (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~~ inches): 8"

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~~ feet) 4'

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

FLOODPLAIN QUALITY (Most Predominant per Bank):
L R
☐☐ Mature Forest, Wetland
☒☒ Immature Forest, Shrub or Old Field
☒☐ Residential, Park, New Field
☐☐ Fenced Pasture
☐☐ Conservation Tillage
☐☐ Urban or Industrial
☐☐ Open Pasture, Row Crop
☐☐ Mining or Construction

COMMENTS T-Line ROW

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 Flowing (heard) - AM

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)

Stream 35 - Modified Class 2

HH-MDT-032816-12

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 ____ NRCS Soil Map Page ____ NRCS Soil Map Stream Order ____

County ____ Township / City ____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/28/16 (Early AM) Quantity ?

Photograph Information 2 Photos, Upstream + Downstream

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) ____ Dissolved Oxygen (mg/l) ____ pH (S.U.) ____ Conductivity (umhos/cm) ____

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

Additional comments/description of pollution impacts n/a

BIOTIC EVALUATION

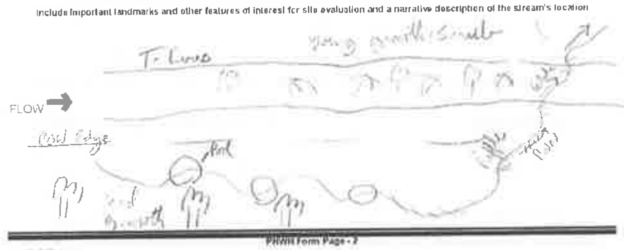
Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



Stream 36 - Modified Class 1

HH-MDT-032816-13

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 27

SITE NAME/LOCATION ____

HH-MDT-032816-13 SITE NUMBER 13 RIVER BASIN ____ DRAINAGE AREA (mi²) ____

LENGTH OF STREAM REACH (ft) ____ LAT. ____ LONG. ____ RIVER CODE ____ RIVER MILE ____

DATE 03/28/16 SCORER MDT/BCR COMMENTS Ephemeral

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
Within T-line ROW

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]	10
☐☐	BOULDER (>256 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☒☐	COBBLE (65-256 mm) [12 pts]	70	☐☐	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 70

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 18

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 4

HHEI Metric Points — Substrate Max = 40: 22 (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~~ feet) 1'

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
☒☒ Wide >10m
☐☐ Moderate 5-10m
☐☐ Narrow <5m
☐☐ None

FLOODPLAIN QUALITY (Most Predominant per Bank):
L R
☐☐ Mature Forest, Wetland
☒☒ Immature Forest, Shrub or Old Field
☐☐ Residential, Park, New Field
☐☐ Fenced Pasture
☐☐ 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 ____

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)

Stream 36 - Modified Class 1

HH-MDT-032816-13

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 ____ NRCS Soil Map Page ____ NRCS Soil Map Stream Order ____

County ____ Township / City ____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/28/16 (Early AM) Quantity Heavy

Photograph Information 2 Photos, Upstream + Downstream

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 (umhos/cm) ____

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

Additional comments/description of pollution impacts n/a

BIOTIC EVALUATION

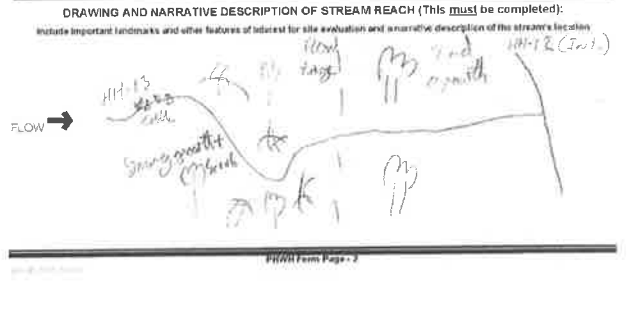
Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



Stream 37 - Modified Class 1

HH-MDT-032816-11

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 23

SITE NAME/LOCATION: Good Hope - Mansfield

HH-MDT-032816-11 SITE NUMBER 11 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 150ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/29/16 SCORER MDT/DER COMMENTS Ephemeral

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: T- Live flow (within)

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 6). 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]	10
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]		☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [8 pts]	10	☐☐	MUCK [0 pts]	
☒☐	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	

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

(B) 4

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

HHEI Metric Points: Substrate Max = 40 → 13; 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 [10 pts]
☐ > 10 - 22.5 cm [5 pts]
☐ > 5 cm - 10 cm [15 pts]
☒ < 5 cm [5 pts]
☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 1*

Pool Depth Max = 30 → 5

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

☐ > 4.0 meters (> 13') [30 pts]
☐ > 3.0m - 4.0m (> 9' 7" - 13') [25 pts]
☐ > 1.5m - 3.0m (> 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): Est 1*

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)

PHWH Form Page - 1

Stream 37 - Modified Class 1

HH-MDT-032816-11

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/29/16 (Early AM) Quantity ? Hours

Photograph Information: 2 Photos, Upstream + Downstream

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) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

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

Additional comments/description of pollution impacts N/A

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

PHWH Form Page - 2

Stream 38 - Modified Class 1

HH-MDT-032816-10

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 24

SITE NAME/LOCATION: Good Hope - Mansfield

HH-MDT-032816-10 SITE NUMBER 10 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) 150ft LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 03/29/16 SCORER MDT/DER COMMENTS Ephemeral

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: Within trans ROW

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 6). 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]	10
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	5	☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [8 pts]	15	☐☐	MUCK [0 pts]	
☒☐	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5 (A) 9

(B) 5

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

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

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 1*

Pool Depth Max = 30 → 5

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

☐ > 4.0 meters (> 13') [30 pts]
☐ > 3.0m - 4.0m (> 9' 7" - 13') [25 pts]
☐ > 1.5m - 3.0m (> 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): 2*

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 Recent flowing water

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)

PHWH Form Page - 1

Stream 38 - Modified Class 1

HH-MDT-032816-10

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/29/16 (Early AM) Quantity ? Hours

Photograph Information: 2 Photos, Upstream + Downstream

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 (umhos/cm) _____

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

Additional comments/description of pollution impacts N/A

BIOTIC EVALUATION

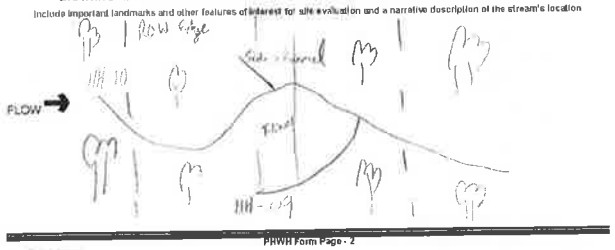
Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



PHWH Form Page - 2

Stream 39 - Modified Class 1

HH-MDT-032816-09

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 24

SITE NAME/LOCATION: Trib Hope - Newton

HH-MDT-032916-09 SITE NUMBER 09 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 03/29/16 SCORER CH/TMK COMMENTS Ephemeral

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: T-Line ROW (within)

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 pts]	25
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-255 mm) [12 pts]	5	☐	CLAY or HARDPAN [0 pts]	
☐	GRAVEL (2-64 mm) [9 pts]	10	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	40	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 9 (B) 6

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

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

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 1.0

Pool Depth Max = 30: 5

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

☐ > 4.0 meters (> 13') [30 pts] ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 6") [15 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]
☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): .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☆

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

COMMENTS Recent Heavy rain

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 meters) ☐ Flat to Moderate ☐ Moderate (2 meters) ☒ Moderate to Severe ☐ Severe (4 meters)

PHWH Form Page - 1

Stream 39 - Modified Class 1

HH-MDT-032816-09

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/28/16 (Early AM) Quantity 2 Hearing

Photograph Information 2 Photos, Upstream + Downstream

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

Were samples collected for water chemistry? (Y/N) N (Note lat. sample no. on 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 N/A

BIOTIC EVALUATION

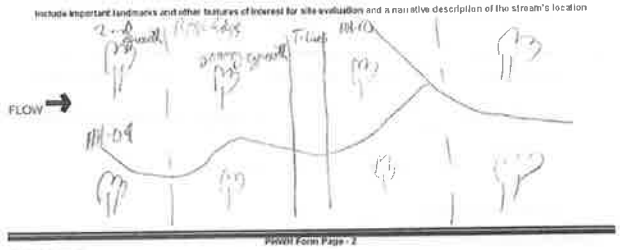
Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



PHWH Form Page - 2

Stream 40 - Modified Class I

HH-MDT-032916-01

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 19

SITE NAME/LOCATION: Trib Hope - Newton

HH-MDT-032916-01 SITE NUMBER 01 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

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

DATE 03/29/16 SCORER CH/TMK COMMENTS Ephemeral

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: Other road near head

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 pts]	VC
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-255 mm) [12 pts]	5	☐	CLAY or HARDPAN [0 pts]	
☐	GRAVEL (2-64 mm) [9 pts]	10	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	40	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A) 1 (B) 5

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

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

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): Dry

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] ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 6") [15 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]
☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): Dry .15

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 Gravel Transmission ROW

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

☐ Stream Flowing ☒ Moist Channel, isolated pools, no flow (Intermittent)
☐ Subsurface flow with isolated pools (Interstitial) ☐ 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 meters) ☐ Flat to Moderate ☐ Moderate (2 meters) ☒ Moderate to Severe ☐ Severe (4 meters)

PHWH Form Page - 1

Stream 40 - Modified Class I

HH-MDT-032916-01

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of last precipitation 03/28/16 Quantity ?

Photograph Information 2 Photos, Upstream + Downstream

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

Were samples collected for water chemistry? (Y/N) N (Note lat. sample no. on 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 N/A

BIOTIC EVALUATION

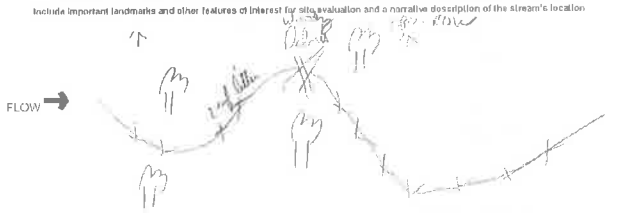
Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



PHWH Form Page - 2

Stream 41 - Modified Class I

HH-MDT-032916-02

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 19

SITE NAME/LOCATION: Good Hope - Hamilton

HH-MDT-032916-02 SITE NUMBER: 02 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): 100 ft LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 03/29/16 SCORER: MDT/ACR COMMENTS: Ephemeral

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 — T-Line ROW

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 [18 pts]		☐	SILT [3 pts]	40
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	5	☐	CLAY or HARDPAN [0 pts]	
☐	GRAVEL (2-64 mm) [9 pts]	10	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	40	☐	ARTIFICIAL [3 pts]	

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

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: Dry/Ice — 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 (feet/meters): 1'

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
- ☐ 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 (0.5-1.0 ft/100 ft) ☐ Moderate to Severe ☒ Severe (>1.0 ft/100 ft)

PHWH Form Page - 1

Stream 41 - Modified Class I

HH-MDT-032916-02

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 03/28/16 Quantity: ?

Photograph Information: 2 Photos: Upstream & Downstream

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: N/A

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)

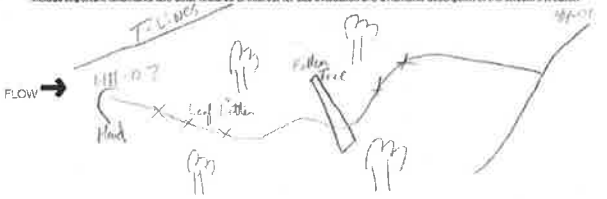
Fish Observed? (Y/N): _____ Voucher? (Y/N): _____ Salamanders Observed? (Y/N): _____ Voucher? (Y/N): _____

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



PHWH Form Page - 2

Stream 42 - Modified Class II

HH-MDT-032916-03

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 55

SITE NAME/LOCATION: Good Hope - Hamilton

HH-MDT-032916-03 SITE NUMBER: 03 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): 600ft LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 03/29/16 SCORER: MDT/ACR COMMENTS: Perennial

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 — Pipeline/Trans. ROW + Stream Ford

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 [18 pts]		☐	SILT [3 pts]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	15	☐	CLAY or HARDPAN [0 pts]	
☐	GRAVEL (2-64 mm) [9 pts]	30	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	30	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 15 (A) 15

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

HHEI Metric Points — Substrate Max = 40: 20 — 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: Ponded — MAXIMUM POOL DEPTH (centimeters): 19"

Pool Depth Max = 30: 20

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 (feet/meters): 4'

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 (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: Agriculture surrounding, but some wooded corridor

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 (0.5-1.0 ft/100 ft) ☐ Moderate to Severe ☐ Severe (>1.0 ft/100 ft)

PHWH Form Page - 1

Stream 42 - Modified Class II

HH-MDT-032916-03

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 03/28/16 Quantity: ?

Photograph Information: 4 Photos: Upstream & Downstream

Elevated Turbidity? (Y/N): N Canopy (% open): 35%

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: N/A

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)

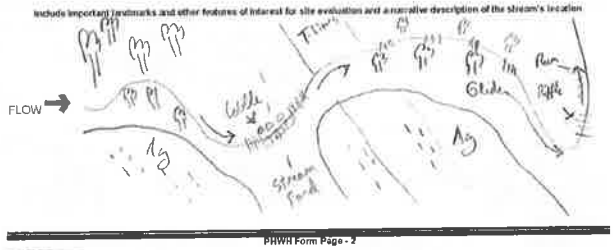
Fish Observed? (Y/N): _____ Voucher? (Y/N): _____ Salamanders Observed? (Y/N): _____ Voucher? (Y/N): _____

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



PHWH Form Page - 2

Stream 43 - Good Warmwater

Good warmwater

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 65.5

Stream & Location: GH-Harrison GH-3/23/16-1 RM: ___ Date: 3/23/16

Scorers Full Name & Affiliation: Philip Romer, AECOM

River Code: ___ STORET #: ___ Lat/Long: ___ / 16 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	___	___	☐☐ HARDPAN [4]	___	___
☐☐ BOULDER [9]	___	___	☐☐ DETRITUS [3]	___	___
☐☐ COBBLE [8]	5	15	☐☐ MUCK [2]	___	___
☑☐ GRAVEL [7]	15	60	☐☐ SILT [2]	7	5
☐☑ SAND [6]	20	20	☐☐ ARTIFICIAL [0]	5	0
☐☐ BEDROCK [5]			(Score natural substrates, ignore		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

ORIGIN (Check ONE (Or 2 & average)): ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☑ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: ☐ HEAVY [-2] ☑ MODERATE [-1] ☐ NORMAL [0] ☐ FREE [1]

SILT: ☐ EXTENSIVE [-2] ☑ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☑ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

Substrate 11 / Maximum 20

Comments

2) INSTREAM COVER Indicate presence 0 to 3. 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

2 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	1 OXBOWS, BACKWATERS [1]	AMOUNT (Check ONE (Or 2 & average))
1 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]	☐ EXTENSIVE >75% [11]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]	☑ MODERATE 25-75% [7]
___ ROOTMATS [1]			☐ SPARSE 5-<25% [3]
			☐ NEARLY ABSENT <5% [1]

Cover Maximum 20 / 14

Comments

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☑ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☑ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Channel Maximum 20 / 14

Comments

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average) (River right looking downstream)

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY	
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☑☑ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☑☑ VERY NARROW < 5m [1]	☑☑ FENCED PASTURE [1]	Indicate predominant land use(s) past 100m riparian.
	☐☐ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Riparian Maximum 10 / 6

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY!)): ☐ ≥ 1m [6] ☑ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average)): ☐ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply): ☐ TORRENTIAL [-1] ☐ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☐ FAST [1] ☐ INTERMITTENT [-2] ☑ MODERATE [1] ☐ EDDIES [1] Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Pool / Current Maximum 12 / 7

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: (Check ONE (Or 2 & average)) ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☑ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm (metric=0)		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0] ☐ EXTENSIVE [-1]

Riffle / Run Maximum 6 / 3.5

Comments

6) GRADIENT (7.5 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [5-10] ☐ HIGH - VERY HIGH [10-6]

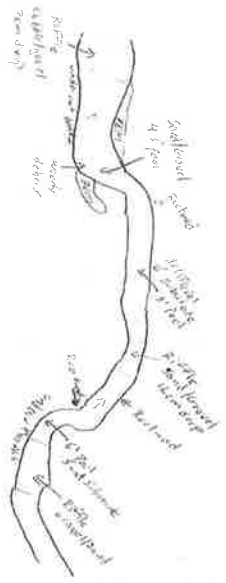
DRAINAGE AREA (7.18 mi²)

%POOL: 35 %GLIDE: 15 %RUN: 10 %RIFFLE: 40

Gradient Maximum 10 / 10

EPA 4520 06/16/00

Stream 43 - Good Warmwater



Stream Drawing:

A) SAMPLED REACH (Check ALL that apply) METHOD: ☐ BOAT ☐ WADE STAGE: ☐ HIGH ☐ UP ☐ NORMAL ☐ LOW ☐ DRY DISTANCE: ☐ 0.5 Km ☐ 0.2 Km ☐ 0.15 Km ☐ 0.2 Km ☐ OTHER CLARITY: ☐ TURBID ☐ MOD. TURBID ☐ CLEAR

C) REC: CANOPY (meters): ☐ >75% OPEN ☐ 50%-<75% ☐ 25%-<50% ☐ 10%-<25% ☐ <10% CLOSED. SECCHI DEPTH: ☐ <20 cm ☐ 20-40 cm ☐ 40-70 cm ☐ >70 cm/ CTB

I) ION: POOL: ☐ >100M ☐ <3M. AREA. DEPTH

B) AESTHETIC: ☐ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CSOs/SSOs/OUTFALLS

D) MAINTENANCE: PUBLIC / PRIVATE / BOTH / NA; ACTIVE / HISTORIC / BOTH / NA; YOUNG-SUCCESSION-OLD; SPRAY / SNAG / REMOVED; MODIFIED / DIPPED OUT / NA; LEVEED / ONE SIDED; RELOCATED / CUTOFFS; MOVING-BEDLOAD-STABLE; ARMOURED / SLUMPS; ISLANDS / SCOURED; IMPOUNDED; FLOOD CONTROL / DRAINAGE

E) ISSUES: WWTP / CSO / NPDES / INDUSTRY; HARDENED / URBAN / CRT&ROMME; CONTAMINATED / LANDFILL; BMP=CONSTRUCTION-SEDIMENT; LOGGING / IRRIGATION / COOLING; BANK / EROSION / SURFACE; FALSE BANK / MANURE / LAGOON; WASH H₂0 / TILE / H₂0 TABLE; ACID / MINE / QUARRY / FLOW; NATURAL / WETLAND / STAGNANT; PARK / GOLF / LAWN / HOME; ATMOSPHERE / DATA PAUCITY

F) MEASUREMENTS: W width; R depth; max. depth; X bankfull width; bankfull X depth; W/D ratio; bankfull max. depth; floodprone² width; entrench. ratio; Sinuosity; Tree:

Comment on: Reach consistency, is reach typical of stream? Recreation Observed - Interviewed, Other, Surveying observations, Concerns, Access directions, etc.

Stream 44 - Fair Warmwater

Fair Warmwater

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 51

Stream & Location: GH-Harrison GH-3/23/16-2 RM: ___ Date: 3/23/16

Scorers Full Name & Affiliation: Philip Romer, AECOM

River Code: ___ STORET #: ___ Lat/Long: ___ / 18 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	___	___	☐☐ HARDPAN [4]	___	___
☐☐ BOULDER [9]	___	___	☐☐ DETRITUS [3]	___	___
☐☐ COBBLE [8]	15	20	☐☐ MUCK [2]	___	___
☑☐ GRAVEL [7]	30	70	☐☐ SILT [2]	5	___
☐☑ SAND [6]	50	___	☐☐ ARTIFICIAL [0]	5	10
☐☐ BEDROCK [5]			(Score natural substrates, ignore		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

ORIGIN (Check ONE (Or 2 & average)): ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: ☐ HEAVY [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ FREE [1]

SILT: ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

Substrate 12 / Maximum 20

Comments

2) INSTREAM COVER Indicate presence 0 to 3. 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]	AMOUNT (Check ONE (Or 2 & average))
___ OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	1 AQUATIC MACROPHYTES [1]	☐ EXTENSIVE >75% [11]
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]	☐ MODERATE 25-75% [7]
___ ROOTMATS [1]			☑ SPARSE 5-<25% [3]
			☐ NEARLY ABSENT <5% [1]

Cover Maximum 20 / 3

Comments

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☑ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☑ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Channel Maximum 20 / 12

Comments

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average) (River right looking downstream)

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY	
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☐☑ MODERATE [2]	☐☑ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☑☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☑ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	Indicate predominant land use(s) past 100m riparian.
	☐☐ NONE [0]	☑☑ OPEN PASTURE, ROWCROP [0]	

Riparian Maximum 10 / 3

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY!)): ☐ ≥ 1m [6] ☑ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average)): ☑ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply): ☐ TORRENTIAL [-1] ☐ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☐ FAST [1] ☐ INTERMITTENT [-2] ☑ MODERATE [1] ☐ EDDIES [1] Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Pool / Current Maximum 12 / 7

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: (Check ONE (Or 2 & average)) ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☑ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm (metric=0)		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0] ☐ EXTENSIVE [-1]

Riffle / Run Maximum 6 / 3

Comments

6) GRADIENT (6.7 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [5-10] ☐ HIGH - VERY HIGH [10-6]

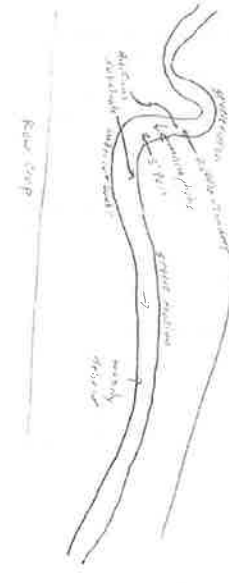
DRAINAGE AREA (4.14 mi²)

%POOL: 55 %GLIDE: 35 %RUN: 5 %RIFFLE: 5

Gradient Maximum 10 / 6

EPA 4520 06/16/00

Stream 44 - Fair Warmwater



Stream Drawing:

A) SAMPLED REACH (Check ALL that apply) METHOD: ☐ BOAT ☐ WADE STAGE: ☐ HIGH ☐ UP ☐ NORMAL ☐ LOW ☐ DRY DISTANCE: ☐ 0.5 Km ☐ 0.2 Km ☐ 0.15 Km ☐ 0.2 Km ☐ OTHER CLARITY: ☐ TURBID ☐ MOD. TURBID ☐ CLEAR

C) REC: CANOPY (meters): ☐ >75% OPEN ☐ 50%-<75% ☐ 25%-<50% ☐ 10%-<25% ☐ <10% CLOSED. SECCHI DEPTH: ☐ <20 cm ☐ 20-40 cm ☐ 40-70 cm ☐ >70 cm/ CTB

I) ION: POOL: ☐ >100M ☐ <3M. AREA. DEPTH

B) AESTHETIC: ☐ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CSOs/SSOs/OUTFALLS

D) MAINTENANCE: PUBLIC / PRIVATE / BOTH / NA; ACTIVE / HISTORIC / BOTH / NA; YOUNG-SUCCESSION-OLD; SPRAY / SNAG / REMOVED; MODIFIED / DIPPED OUT / NA; LEVEED / ONE SIDED; RELOCATED / CUTOFFS; MOVING-BEDLOAD-STABLE; ARMOURED / SLUMPS; ISLANDS / SCOURED; IMPOUNDED; FLOOD CONTROL / DRAINAGE

E) ISSUES: WWTP / CSO / NPDES / INDUSTRY; HARDENED / URBAN / CRT&ROMME; CONTAMINATED / LANDFILL; BMP=CONSTRUCTION-SEDIMENT; LOGGING / IRRIGATION / COOLING; BANK / EROSION / SURFACE; FALSE BANK / MANURE / LAGOON; WASH H₂0 / TILE / H₂0 TABLE; ACID / MINE / QUARRY / FLOW; NATURAL / WETLAND / STAGNANT; PARK / GOLF / LAWN / HOME; ATMOSPHERE / DATA PAUCITY

F) MEASUREMENTS: W width; R depth; max. depth; X bankfull width; bankfull X depth; W/D ratio; bankfull max. depth; floodprone² width; entrench. ratio; Sinuosity; Tree:

Comment on: Reach consistency, is reach typical of stream? Recreation Observed - Interviewed, Other, Surveying observations, Concerns, Access directions, etc.

Stream 45, Modified Class 1

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 33

SITE NAME/LOCATION GH-Harrison
SITE NUMBER HH-3/23/16-1 RIVER BASIN ______ DRAINAGE AREA (mi²) ______
LENGTH OF STREAM REACH (ft) ______ LAT. ______ LONG. ______ RIVER CODE ______ RIVER MILE ______
DATE 3/23/16 SCORER PJR 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]	15
☐☐	BOULDER (>256 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]		☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [9 pts]	5	☐☐	MUCK [0 pts]	
☑☑	SAND (<2 mm) [6 pts]	75	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 9
TOTAL NUMBER OF SUBSTRATE TYPES: (B) 4

HHEI Metric Points — Substrate Max = 40: 13 (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) (in): 3

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) (Ft.): 2.5

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 ☐ Wide >10m
- L ☐ R ☐ Moderate 5-10m
- L ☑ R ☑ Narrow <5m
- L ☐ R ☐ None

FLOODPLAIN QUALITY (Most Predominant per Bank)
- ☐☐ Mature Forest, Wetland
- ☐☐ Immature Forest, Shrub or Old Field
- ☐☐ Residential, Park, New Field
- ☐☐ Fenced Pasture
- ☐☐ 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 ______

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

Stream 45, Modified Class 1

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 ______ NRCS Soil Map Page ______ NRCS Soil Map Stream Order ______
County ______ Township / City ______

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation ______ Quantity ______
Photograph Information ______
Elevated Turbidity? (Y/N) N Canopy (% open) 90
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

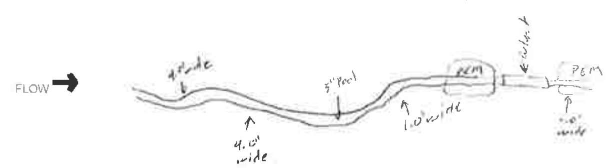
Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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

FLOW →



Stream 46 - Fair Warmwater

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

Fair Warmwater

QHEI Score: 50.5

Stream & Location: GH-Harrison GH-3/23/16-3 RM: ______ Date: 3/23/06
Scorers Full Name & Affiliation: Philip Renner AFCOM
River Code: ______ STORET #: ______ Lat./Long.: ______ /8 ______ Office verified location ☐

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	5	15	☐☐ MUCK [2]		
☐☑ GRAVEL [7]	25	75	☐☐ SILT [2]	5	0
☑☐ SAND [6]	65	10	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]
Comments

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☑ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY — SILT: ☐ HEAVY [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ FREE [1]
EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ NONE [1]

Substrate Maximum 20: 13

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]
__ OVERHANGING VEGETATION [1]
__ SHALLOWS (IN SLOW WATER) [1]
__ ROOTMATS [1]
__ POOLS > 70cm [2]
__ ROOTWADS [1]
__ BOULDERS [1]
__ OXBOWS, BACKWATERS [1]
__ AQUATIC MACROPHYTES [1]
1 LOGS OR WOODY DEBRIS [1]

AMOUNT — Check ONE (Or 2 & average): ☐ EXTENSIVE >75% [11] ☐ MODERATE 25-75% [7] ☑ SPARSE 5-<25% [3] ☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20: 5

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY: ☑ HIGH [4] ☐ MODERATE [3] ☐ LOW [2] ☐ NONE [1]
DEVELOPMENT: ☐ EXCELLENT [7] ☑ GOOD [5] ☑ FAIR [3] ☐ POOR [1]
CHANNELIZATION: ☑ NONE [6] ☐ RECOVERED [4] ☐ RECOVERING [3] ☐ RECENT OR NO RECOVERY [1]
STABILITY: ☐ HIGH [3] ☑ MODERATE [2] ☑ LOW [1]

Comments

Channel Maximum 20: 15

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average) River right looking downstream

EROSION (L R): ☐☐ NONE / LITTLE [3] ☑☑ MODERATE [2] ☑☑ HEAVY / SEVERE [1]
RIPARIAN WIDTH (L R): ☐☐ WIDE > 50m [4] ☐☐ MODERATE 10-50m [3] ☑☑ NARROW 5-10m [2] ☐☐ VERY NARROW < 5m [1] ☐☐ NONE [0]
FLOOD PLAIN QUALITY (L R): ☐☐ FOREST, SWAMP [3] ☐☐ SHRUB OR OLD FIELD [2] ☐☐ RESIDENTIAL, PARK, NEW FIELD [1] ☐☐ FENCED PASTURE [1] ☑☑ OPEN PASTURE, ROWCROP [0] ☐☐ CONSERVATION TILLAGE [1] ☐☐ URBAN OR INDUSTRIAL [0] ☐☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian Maximum 10: 3.5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH — Check ONE (ONLY!): ☐ > 1m [6] ☐ 0.7-<1m [4] ☑ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]
CHANNEL WIDTH — Check ONE (Or 2 & average): ☐ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☑ POOL WIDTH < RIFFLE WIDTH [0]
CURRENT VELOCITY — Check ALL that apply: ☐ TORRENTIAL [-1] ☐ VERY FAST [1] ☐ FAST [1] ☑ MODERATE [1] ☐ SLOW [1] ☐ INTERSTITIAL [-1] ☐ INTERMITTENT [-2] ☐ EDDIES [1]
Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Comments

Pool / Current Maximum 12: 3

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH: ☐ BEST AREAS > 10cm [2] ☐ BEST AREAS 5-10cm [1] ☑ BEST AREAS < 5cm [metric=0]
RUN DEPTH: ☐ MAXIMUM > 50cm [2] ☑ MAXIMUM < 50cm [1]
RIFFLE / RUN SUBSTRATE: ☐ STABLE (e.g., Cobble, Boulder) [2] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]
RIFFLE / RUN EMBEDDEDNESS: ☐ NONE [2] ☐ LOW [1] ☑ MODERATE [0] ☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8: 1

6] GRADIENT (30 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]
DRAINAGE AREA (2.52 mi²)
%POOL: 15 %GLIDE: 75 %RUN: 5 %RIFFLE: 5
Gradient Maximum 10: 10

EPA 4520 06/16/06

Stream 46 - Fair Warmwater

A] SAMPLED REACH Check ALL that apply

METHOD: ☐ BOAT ☑ WADE ☐ L. LINE ☐ OTHER
DISTANCE: ☐ 0.5 Km ☑ 0.2 Km ☐ 0.15 Km ☐ 0.12 Km ☐ OTHER ____ meters
STAGE (1st sample pass 2nd): ☐ HIGH ☐ UP ☑ NORMAL ☐ LOW ☐ DRY
CLARITY (1st sample pass 2nd): ☐ < 20 cm ☐ 20-<40 cm ☐ 40-70 cm ☑ > 70 cm/ CTB ☐ SECCHI DEPTH 1st ____ cm 2nd ____ cm
CANOPY: ☐ > 85% OPEN ☑ 55%-<85% ☐ 30%-<55% ☐ 10%-<30% ☐ <10% CLOSED

C] REC

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.
Pasture
MPD = 2.0"
XFW = 6.5'

B] AESTHETIC: ☐ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CSOs/SSOs/OUTFALLS

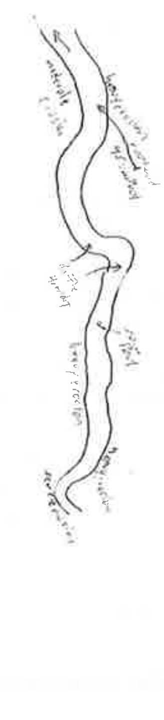
ION — AREA DEPTH — POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE Circle some & COMMENT: PUBLIC / PRIVATE / BOTH / NA; ACTIVE / HISTORIC / BOTH / NA; YOUNG-SUCCESSION-OLD; SPRAY / SNAG / REMOVED; MODIFIED / DIPPED OUT / NA; LEVEED / ONE SIDED; RELOCATED / CUTOFFS; MOVING-BEDLOAD-STABLE; ARMOURED / SLUMPS; ISLANDS / SCOURED; IMPOUNDED / DESICCATED; FLOOD CONTROL / DRAINAGE

E] ISSUES: WWTP / CSO / NPDES / INDUSTRY; HARDENED / URBAN / DIRT&GRIME; CONTAMINATED / LANDFILL; BMPs-CONSTRUCTION-SEDIMENT; LOGGING / IRRIGATION / COOLING; BANK / EROSION / SURFACE; FALSE BANK / MANURE / LAGOON; WASH H_2O / TILE / H_2O TABLE; ACID / MINE / QUARRY / FLOW; NATURAL / WETLAND / STAGNANT; PARK / GOLF / LAWN / HOME; ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS: x̄ width; x̄ depth; max. depth; x̄ bankfull width; bankfull x̄ depth; W/D ratio; bankfull max. depth; floodprone x² width; entrench. ratio; La; Tree:

Stream Drawing:



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 51

Stream 47, Modified Class 2

SITE NAME/LOCATION Good Hope - Hardesty

SITE NUMBER HH-3/2016-1 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT _____ LONG _____ RIVER CODE _____ RIVER MILE _____

DATE 3/24/2016 SCORER PSR COMMENTS Intermittent 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:

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 pts]	65
☐	BOULDER (>255 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-255 mm) [12 pts]	5	☐	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: 5 (A): 12

(B): 4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 4

HHEI Metric Points — Substrate Max = 40: 16 — 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): 30

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): Ft. 2.5

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 _____

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 m/km) ☐ Flat to Moderate ☑ Moderate (0.5 - 2.0 m/km) ☐ Moderate to Severe ☐ Severe (> 4.0 m/km)

PHWH Form Page - 1

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 95

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)

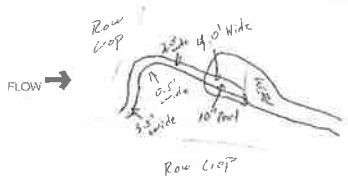
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 47

Stream 48, Modified Class 2

SITE NAME/LOCATION Good Hope - Hardesty

SITE NUMBER HH-3/2016-2 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT _____ LONG _____ RIVER CODE _____ RIVER MILE _____

DATE 3/24/2016 SCORER PSR COMMENTS Intermittent 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:

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 pts]	25
☐	BOULDER (>255 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-255 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	15	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0 (A): 12

(B): 3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: 3

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): 30

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): Ft. 2.1

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 m/km) ☐ Flat to Moderate ☑ Moderate (0.5 - 2.0 m/km) ☐ Moderate to Severe ☐ Severe (> 4.0 m/km)

PHWH Form Page - 1

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N) N Canopy (% open): 95

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)

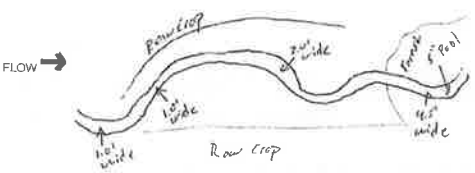
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 53

Stream 49, Modified Class 2

SITE NAME/LOCATION: Good Hope - Hocking

SITE NUMBER: pd-3/24/16 - 3 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/24/16 SCORER: PSR COMMENTS: Intermittent stream

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]	2	☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	8	☐☐	CLAY or HARDPAN [0 pt]	
☑☐	GRAVEL (2-64 mm) [8 pts]	40	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]	5	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 10 (A): 12

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

HHEI Metric Points — Substrate Max = 40: 18 — A + B: 5

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): 10 — Pool Depth Max = 30: 10

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

- ☐ > 4.6 meters (> 15') [30 pts]
- ☐ > 3.0 m - 4.6 m (> 9'7" - 15') [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): 1.5 — 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)		FLOODPLAIN QUALITY (Most Predominant per Bank)		
L R		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
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☑ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (< 0.5 ft/mi) ☐ Flat to Moderate ☑ Moderate (2.5 ft/mi) ☐ Moderate to Severe ☐ Severe (> 10 ft/mi)

PHWH Form Page - 1

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 85

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)

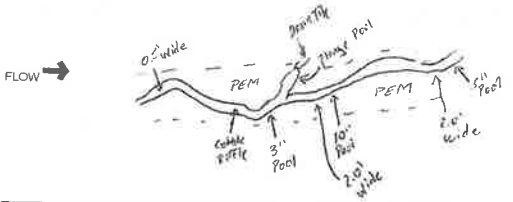
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 29

Stream 50, Modified Class 1

SITE NAME/LOCATION: Good Hope - Hocking

SITE NUMBER: HH-3/24/16 - 4 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/24/2016 SCORER: PSR COMMENTS: Intermittent Stream

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]	90
☐☐	BOULDER (>256 mm) [16 pts]		☐☑	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]		☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [8 pts]	3	☐☐	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: 3

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): 3 — Pool Depth Max = 30: 15

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

- ☐ > 4.6 meters (> 15') [30 pts]
- ☐ > 3.0 m - 4.6 m (> 9'7" - 15') [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: 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)		FLOODPLAIN QUALITY (Most Predominant per Bank)		
L R		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
- ☐ 0.5
- ☑ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (< 0.5 ft/mi) ☐ Flat to Moderate ☑ Moderate (2.5 ft/mi) ☐ Moderate to Severe ☐ Severe (> 10 ft/mi)

PHWH Form Page - 1

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: _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 100

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)

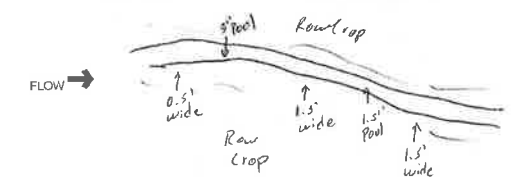
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



PHWH Form Page - 2

Stream & Location: QH-3/2416-1 Good Hope - Harrison RM: ___ Date: 3/24/16 44.5

Stream 51 Fair Warmwater Scorers Full Name & Affiliation: Philip Reaser, AECOM

River Code: ___-___-___ STORET #: ___ Lat/Long.: (NAD 83 - decimal) ___.____ / 18_.____ Office verified location ☐

Stream 51 Fair Warmwater Perennial

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR SLABS [10]	___	___	☐☐ HARDPAN [4]	___	___
☐☐ BOULDER [9]	___	___	☐☐ DETRITUS [3]	___	___
☐☐ COBBLE [8]	___	___	☐☐ MUCK [3]	___	___
☐☒ GRAVEL [7]	10	65	☐☐ SILT [2]	15	10
☑☐ SAND [6]	22	25	☐☐ ARTIFICIAL [0]	___	___
☐☐ BEDROCK [5]	___	___	(Score natural substrates; ignore sludge from point sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIPRAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

SILT: ☐ HEAVY [-2] ☐ MODERATE [-1] ☐ NORMAL [0] ☐ FREE [1] ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

EMBEDDEDNESS

Substrate 12 / Maximum 20

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well defined, functional pools.

___ UNDERCUT BANKS [1] ___ OVERHANGING VEGETATION [1] ___ SHALLOWS (IN SLOW WATER) [1] ___ ROOTMATS [1]

___ POOLS > 70cm [2] ___ ROOTWADS [1] ___ BOULDERS [1]

___ OXBOWS, BACKWATERS [1] ___ AQUATIC MACROPHYTES [1] _1_ LOGS OR WOODY DEBRIS [1]

AMOUNT — Check ONE (Or 2 & average)
☐ EXTENSIVE >75% [11] ☐ MODERATE 25-75% [7] ☑ SPARSE 5-25% [3] ☐ NEARLY ABSENT <5% [1]

Cover Maximum 20: 6

Comments

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☑ MODERATE [3]	☐ GOOD [5]	☑ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Channel Maximum 20: 11.5

Comments

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION (River right looking downstream)	L	R
☑ NONE / LITTLE [3]	☑	☑
☐ MODERATE [2]	☐	☐
☐ HEAVY / SEVERE [1]	☐	☐

RIPARIAN WIDTH

	L	R
☐ WIDE > 50m [4]	☐	☐
☐ MODERATE 10-50m [3]	☐	☐
☑ NARROW 5-10m [2]	☐	☑
☐ VERY NARROW < 5m [1]	☑	☐
☐ NONE [0]	☐	☐

FLOOD PLAIN QUALITY

	L	R
☐ FOREST, SWAMP [3]	☐	☐
☐ SHRUB OR OLD FIELD [2]	☐	☐
☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐	☐
☐ FENCED PASTURE [1]	☐	☐
☑ OPEN PASTURE, ROWCROP [0]	☑	☑

☐ CONSERVATION TILLAGE [1] ☐ URBAN OR INDUSTRIAL [0] ☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10: 4

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH — Check ONE (ONLY)
☐ > 1m [6] ☐ 0.7-<1m [4] ☑ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH — Check ONE (Or 2 & average)
☐ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☑ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY — Check ALL that apply
☐ TORRENTIAL [-1] ☐ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☐ FAST [1] ☐ INTERMITTENT [-2] ☑ MODERATE [1] ☐ EDDIES [1]
Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Pool / Current Maximum 12: 3

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of rifle-obligate species: Check ONE (Or 2 & average) ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
☐ BEST AREAS > 10cm [2] ☐ BEST AREAS 5-10cm [1] ☑ BEST AREAS < 5cm [metric=0]

RUN DEPTH
☐ MAXIMUM > 50cm [2] ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
☐ STABLE (e.g., Cobble, Boulder) [2] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
☐ NONE [2] ☐ LOW [1] ☐ MODERATE [0] ☐ EXTENSIVE [-1]

Riffle / Run Maximum 8: 0

Comments

6) GRADIENT (24 ft/mi) DRAINAGE AREA (7.18 mi²)
☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

%POOL: 65 %GLIDE: 20 %RUN: 5 %RIFFLE: 10

Gradient Maximum 12: 8

EPA 4520 06/16/06

SAMPLED REACH (Check ALL that apply)

STAGE: ☐ DRY ☐ LOW ☑ NORMAL ☐ HIGH ☐ FLOOD

CLARITY: ☐ CLEAR ☐ 20-40 cm ☐ 10-20 cm ☐ <10 cm ☐ OPAQUE ☐ TANNIC ☐ SECCHI DEPTH ___ cm

B) AESTHETIC: ☐ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ OIL SHEEN ☐ CSOs/SSOs/OUTFALLS

C) REC: LOCATION ☐ POOL ☐ RIFFLE AREA DEPTH ☐ >100ft ☐ <25ft

CANOPY: ☐ OPEN ☐ >90% ☐ 75-90% ☐ 50-75% ☐ 25-50% ☐ <25% ☐ CLOSED

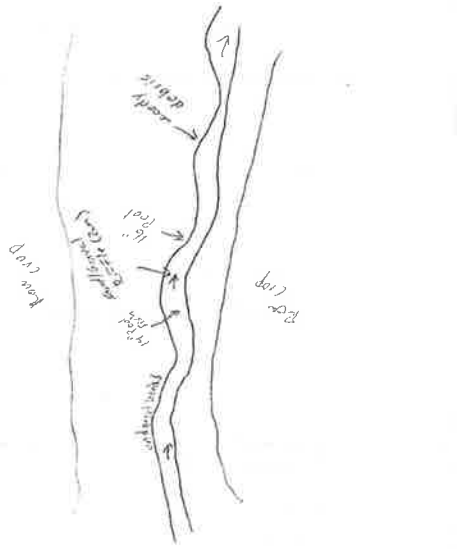
D) MAINTENANCE: ☐ PUBLIC / PRIVATE / BOTH / NA ☐ ACTIVE / HISTORIC / BOTH / NA ☐ YOUNG-SUCCESSION-OLD ☐ SPRAY / SNAG / REMOVED ☐ MODIFIED DIPPER DAM / NA ☐ CHANNEL DIPPER DAM / NA ☐ RELOCATED / CUTOFFS ☐ MOVING-BIED-LOAD-STABLE ☐ ARMOURED / SLUMPS ☐ ISLANDS / SCOURED ☐ IMPOUNDED / DESICCATED ☐ FLOOD CONTROL / DRAINAGE

E) ISSUES (Circle some & COMMENT): WWTP / CSO / NPDES / INDUSTRY; HARDENED / URBAN / DIRT&GRIME; CONTAMINATED / LANDFILL; BMPs-CONSTRUCTION-SEDIMENT; LOGGING / RESECTION / CLEARING; BANK / EROSION / SURFACE; FALSE BANK / MANURE / LAGOON; WASH H2O / TILE / H2O TABLE; AGID / MINE / QUARRY / FLOW; NATURAL / WETLAND / STAGNANT; PARK / GOLF / LAWN / HOME; ATMOSPHERE / DATA PAUCITY

F) MEASUREMENTS: Time: ___ Lat: ___ % width; % depth; max. depth; % bankfull width; bankfull % depth; W/D ratio; bankfull max. depth; floodprone x 3 width; entrench. ratio

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

Stream Drawing:



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 49

Stream 52, Modified Class 2

SITE NAME/LOCATION: Good Hope - Harrison

SITE NUMBER: QH-3/2416-1 RIVER BASIN: ___ DRAINAGE AREA (mi²): ___

LENGTH OF STREAM REACH (ft): ___ LAT: ___ LONG: ___ RIVER CODE: ___ RIVER MILE: ___

DATE: 3/24/2016 SCORER: PSR COMMENTS: Talon-Hart Storms

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:

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 [10 pts]	___	☐	☐ SILT [3 pts]	15
☐	☐ BOULDER (>256 mm) [16 pts]	___	☐	☐ LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	☐ BEDROCK [16 pts]	___	☐	☐ FINE DETRITUS [3 pts]	___
☐	☐ COBBLE (65-256 mm) [12 pts]	___	☐	☐ CLAY or HARDPAN [0 pts]	___
☒	☐ GRAVEL (2-64 mm) [9 pts]	60	☐	☐ MUCK [0 pts]	___
☐	☐ SAND (<2 mm) [6 pts]	20	☐	☐ ARTIFICIAL [3 pts]	___

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0 (A): 17 (B): 7

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

HHEI Metric Points — Substrate Max = 40: 19 (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 [29 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]

Pool Depth Max = 30: 25

COMMENTS: ___ MAXIMUM POOL DEPTH (centimeters): 41

3. BANKFULL WIDTH (Measured as the average of 3-5 measurements) (Check ONLY one box):

- ☐ > 4 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]

Bankfull Width Max=30: 5

COMMENTS: ___ AVERAGE BANKFULL WIDTH (meters): EJ 2.5

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	
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 (Intermittent)
- ☐ 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/mile) ☐ Flat to Moderate ☑ Moderate (~ 1 ft/mile) ☐ Moderate to Severe ☐ Severe (20 ft/mile)

PHWH Form Page - 1

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: ___

Stream 52, Modified Class 2

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

USGS Quadrangle Name: ___ NRCS Soil Map Page ___ NRCS Soil Map Stream Order ___

County: ___ Township / City: ___

MISCELLANEOUS

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

Photograph Information: ___

Elevated Turbidity? (Y/N): N Canopy (% open): 95

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)

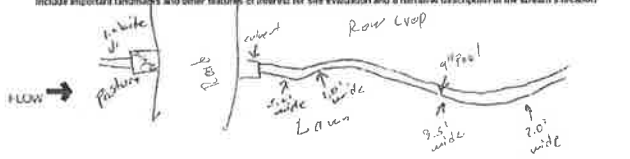
Fish Observed? (Y/N) ___ Voucher? (Y/N) ___ Salamanders Observed? (Y/N) ___ Voucher? (Y/N) ___

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



PHWH Form Page - 2

Stream & Location: OH-3/24/16-2 Good Hope - Harrison RM: ___._ Date: 3/24/06 66

Stream 53 Good Warmwater Scorers Full Name & Affiliation: Philip Renner, RECON

River Code: __-___-___ STORET #: ____ Lat./Long.: __.____ /8_.____ Office verified location ☐

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	0	5	☐☐ MUCK [2]		
☐☑ GRAVEL [7]	15	75	☐☐ SILT [2]	5	0
☑☐ SAND [6]	80	20	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Comments

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ☑ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: SILT ☐ HEAVY [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ FREE [1]; EMBEDDEDNESS ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ NONE [1]

Substrate Maximum 20: **14**

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]
1 OVERHANGING VEGETATION [1]
__ SHALLOWS (IN SLOW WATER) [1]
__ ROOTMATS [1]
2 POOLS > 70cm [2]
1 ROOTWADS [1]
__ BOULDERS [1]
__ OXBOWS, BACKWATERS [1]
1 AQUATIC MACROPHYTES [1]
__ LOGS OR WOODY DEBRIS [1]

AMOUNT Check ONE (Or 2 & average): ☐ EXTENSIVE >75% [11] ☑ MODERATE 25-75% [7] ☐ SPARSE 5-<25% [3] ☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20: **13**

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☑ HIGH [4]	☐ EXCELLENT [7]	☑ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☑ GOOD [5]	☑ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☑ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel Maximum 20: **14.5**

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☑☑ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☑☑ HEAVY / SEVERE [1]	☑☑ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	Indicate predominant land use(s) past 100m riparian.
	☐☐ NONE [0]	☑☑ OPEN PASTURE, ROWCROP [0]	

Comments

Riparian Maximum 10: **3.5**

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH — Check ONE (ONLY!): ☑ > 1m [6] ☐ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH — Check ONE (Or 2 & average): ☑ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH > RIFFLE WIDTH [0]

CURRENT VELOCITY — Check ALL that apply: ☐ TORRENTIAL [-1] ☐ VERY FAST [1] ☐ FAST [1] ☑ MODERATE [1] ☐ SLOW [1] ☐ INTERSTITIAL [-1] ☐ INTERMITTENT [-2] ☐ EDDIES [1] Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Comments

Pool / Current Maximum 12: **9**

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH: ☐ BEST AREAS > 10cm [2] ☑ BEST AREAS 5-10cm [1] ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH: ☐ MAXIMUM > 50cm [2] ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE: ☐ STABLE (e.g., Cobble, Boulder) [2] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS: ☐ NONE [2] ☐ LOW [1] ☑ MODERATE [0] ☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8: **2**

6] GRADIENT (26 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (4.13 mi²)

%POOL: 65 %GLIDE: 25 %RUN: 5 %RIFFLE: 5

Gradient Maximum 10: **10**

EPA 4520 06/16/06

Stream 53 Good Warmwater Perennial

Comment RE: Reach consistency/ Is reach typical of steam?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

MPLED REACH — Check ALL that apply

STAGE: 1st-sample pass-2nd ☐☐ HIGH ☐☐ UP ☑☐ NORMAL ☐☐ LOW ☐☐ DRY

CLARITY: ☐☐ < 20 cm ☐☐ 20-<40 cm ☐☐ 40-70 cm ☑☐ > 70 cm/ CTB ☐☐ SECCHI DEPTH ___ cm ___ cm

NOPY: >85%- OPEN, 55%-<85%, 30%-<55%, 10%-<30%, <10%- CLOSED

C] REC

BJ AESTHETIC: ☐ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CSOs/SSOs/OUTFALLS

ION — POOL: AREA ☐ >100ft²? DEPTH ☐ >3ft

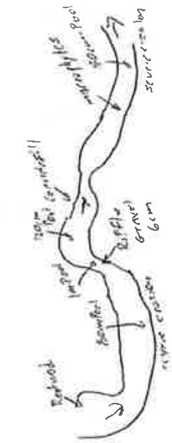
DJ MAINTENANCE: PUBLIC / PRIVATE / BOTH / NA; ACTIVE / HISTORIC / BOTH / NA; YOUNG-SUCCESSION-OLD; SPRAY / SNAG / REMOVED; MODIFIED / DIPPED OUT / NA; LEVEED / ONE SIDED; RELOCATED / CUTOFFS; MOVING-BEDLOAD-STABLE; ARMOURED / SLUMPS; ISLANDS / SCOURED; IMPOUNDED / DESICCATED; FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

EJ ISSUES: WWTP / CSO / NPDES / INDUSTRY; HARDENED / URBAN / DIRT&GRIME; CONTAMINATED / LANDFILL; BMPs-CONSTRUCTION-SEDIMENT; LOGGING / IRRIGATION / COOLING; BANK / EROSION / SURFACE; FALSE BANK / MANURE / LAGOON; WASH H_2O / TILE / H_2O TABLE; ACID / MINE / QUARRY / FLOW; NATURAL / WETLAND / STAGNANT; PARK / GOLF / LAWN / HOME; ATMOSPHERE / DATA PAUCITY

FJ MEASUREMENTS: x̄ width; x̄ depth; max. depth; x̄ bankfull width; bankfull x̄ depth; W/D ratio; bankfull max. depth; floodprone x^2 width; entrench. ratio; Lo Tree:

am Drawing:



Stream 54, Modified Class 2

Stream 54, Modified Class 2

HII-BAE-032416-04

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 42

SITE NAME/LOCATION ____
hh-bae-032416-04 SITE NUMBER 04 RIVER BASIN ______ DRAINAGE AREA (mi²) ______
LENGTH OF STREAM REACH (ft) ____ LAT. ____ LONG. ____ RIVER CODE ____ RIVER MILE ____
DATE 3/24/16 SCORER BAE/MS 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
ag ditch

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]	20
☐☐	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]	40	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock ____

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 9 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): 4"

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) 45"

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 ____

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)

HII-BAE-032416-04

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 ____ NRCS Soil Map Page ____ NRCS Soil Map Stream Order ____
County ____ Township / City ____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation — Quantity —
Photograph Information 2894 2896
Elevated Turbidity? (Y/N) N Canopy (% open) 100
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

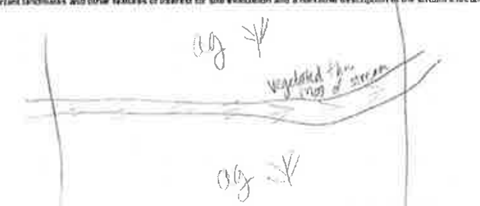
Performed? (Y/N) N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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

FLOW →



Stream 55, Modified Class 1

hh-bae-032416-03

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 29

SITE NAME/LOCATION: hh-bae-032416-03 SITE NUMBER: 03 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/24/16 SCORER: AKE / DMS COMMENTS: Intermittent

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

grading / log / TL Row

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 pts]	15
☐☐	BOULDER (>255 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-258 mm) [12 pts]	10	☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [8 pts]	45	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: _____ (A) 15 (B) 4

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

HHEI Metric Points — Substrate Max = 40: 19 (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 [10 pts]
- ☐ > 10 - 22.5 cm [23 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☒ ≤ 5 cm [3 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 5"

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [20 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): 2'

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	
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: pipe leaving to E.C.

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 (≤ 5 ft/mile) ☒ Flat to Moderate ☐ Moderate (> 40 ft/mile) ☐ Moderate to Severe ☐ Severe (> 80 ft/mile)

Stream 55, Modified Class 1

hh-bae-032416-03

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

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

Photograph Information: DSC 2872

Elevated Turbidity? (Y/N): N Canopy (% open): 90

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)

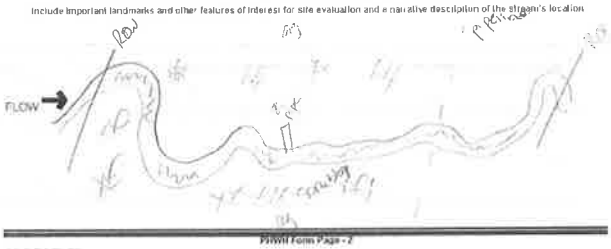
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



Stream 56, Modified Class 2

hh-bae-032416-01

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 45

SITE NAME/LOCATION: _____ SITE NUMBER: 01 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): _____ LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 3/24/16 SCORER: AKE / DMS COMMENTS: Intermittent

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

No 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
☐☐	BLDR SLABS [16 pts]		☐☐	SILT [3 pts]	10
☐☐	BOULDER (>258 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-255 mm) [12 pts]	3	☐☐	CLAY or HARDPAN [0 pt]	
☒☐	GRAVEL (2-64 mm) [8 pts]	40	☐☐	MUCK [0 pts]	
☐☒	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 3 (A) 15 (B) 5

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

HHEI Metric Points — Substrate Max = 40: 20 (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 [10 pts]
- ☐ > 10 - 22.5 cm [23 pts]
- ☒ > 5 cm - 10 cm [15 pts]
- ☐ ≤ 5 cm [3 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 10

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') [20 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): 1.5

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	
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 (≤ 5 ft/mile) ☒ Flat to Moderate ☐ Moderate (> 40 ft/mile) ☐ Moderate to Severe ☐ Severe (> 80 ft/mile)

Stream 56, Modified Class 2

hh-bae-032416-01

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 _____ NRCS Soil Map Page _____ NRCS Soil Map Stream Order _____

County _____ Township / City _____

MISCELLANEOUS

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

Photograph Information: DSC 2874 UP; DSC 2873 DWS

Elevated Turbidity? (Y/N): N Canopy (% open): 90

Were samples collected for water chemistry? (Y/N): N (Note: if 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)

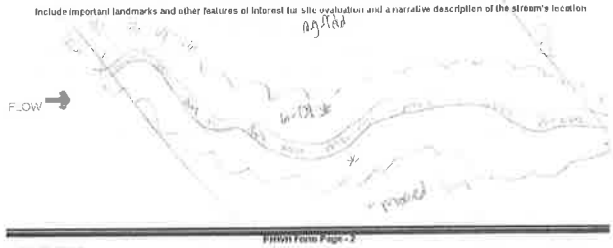
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



Stream 57 Good Warmwater

QH-BAE- 032416-01 Good Warmwater

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet — QHEI Score: 63.5

Stream & Location: Harrison - GH — QH-BAE-032416-01 — RM: — Date: 1/ 1/06

Scorers Full Name & Affiliation: BAE/CMS 3/24/16

River Code: — STORET #: — Lat./Long.: /8 — Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present. Check ONE (Or 2 & average)

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]		5	☐☐ DETRITUS [3]		
☐☐ COBBLE [8]		60	☐☐ MUCK [2]		
☐☐ GRAVEL [7]	10	20	☐☐ SILT [2]	20	5
☐☐ SAND [6]	10	10	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore estimate % or note every type present.)		

NUMBER OF BEST TYPES: ☒ 4 or more [2] (sludge from point-sources) ☐ 3 or less [0]

ORIGIN: ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☒ SANDSTONE [0] ☐ RIPRAP [0] ☐ LACUSTRINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

SILT / EMBEDDEDNESS QUALITY: ☐ HEAVY [-2] ☒ MODERATE [-1] ☐ NORMAL [0] ☐ FREE [1] ☐ EXTENSIVE [-2] ☒ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

Substrate Maximum 20: 14

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent, 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

			AMOUNT (Check ONE (Or 2 & average))
1 UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]	☐ EXTENSIVE >75% [11]
1 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]	☒ MODERATE 25-75% [7]
___ SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]	☒ SPARSE 5-<25% [3]
___ ROOTMATS [1]			☐ NEARLY ABSENT <5% [1]

5 — Cover Maximum 20: 9

Comments 4

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☒ MODERATE [3]	☒ GOOD [5]	☒ RECOVERED [4]	☒ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☒ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments 3 5 3.5 2 — Channel Maximum 20: 13.5

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average). River right looking downstream

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY	
L R	L R	L R	
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☒ ☐ MODERATE [2]	☒ ☒ MODERATE 10-50m [3]	☒ ☒ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☒ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	Indicate predominant land use(s) past 100m riparian.
	☐ ☐ NONE [0]	☒ ☒ OPEN PASTURE, ROWCROP [0]	Riparian Maximum 10: 5.5

Comments 1.5 3 1

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY)): ☐ > 1m [6] ☒ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average)): ☒ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH > RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply): ☐ TORRENTIAL [-1] ☒ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☐ FAST [1] ☐ INTERMITTENT [-2] ☒ MODERATE [1] ☐ EDDIES [1] Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Comments 2 2 — Pool / Current Maximum 12: 8

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average) ☐ NO RIFFLE (metric=0)

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☒ STABLE (e.g., Cobble, Boulder) [2]	☒ NONE [3]
☒ BEST AREAS 5-10cm [1]	☒ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm (metric=0)		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0] ☐ EXTENSIVE [-1]

Comments 1 1 1.5 — Riffle / Run Maximum 6: 5.5

6) GRADIENT (40 ft/mi) — DRAINAGE AREA (6.84 mi²)

☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

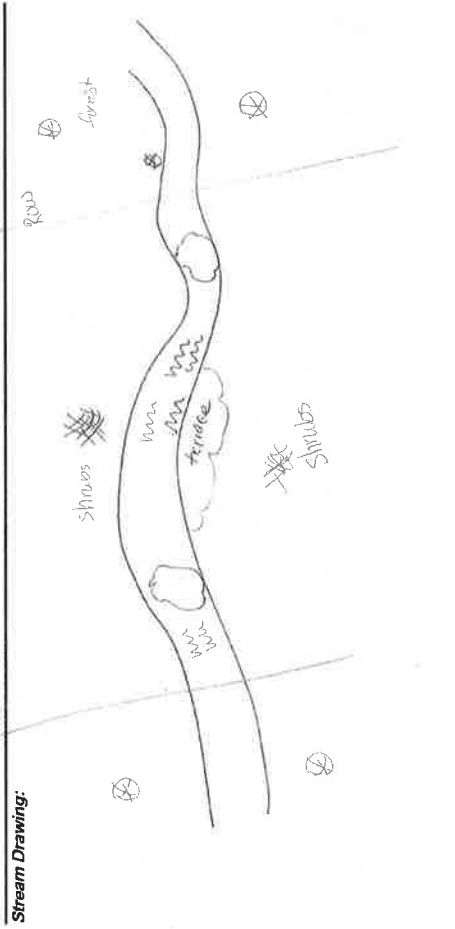
%POOL: 20 %GLIDE: 40 %RUN: 0 %RIFFLE: 40

Gradient Maximum 10: 8

EPA 4520 — 08/16/06

Stream 57 Good Warmwater

Stream Drawing:



Comment RE: Riparian consistency in reach, type of stream? Pasture/Observed - interview; Other/Sampling observations, Concerns, Across directions, etc.

A) SAMPLED REACH Check ALL that apply

METHOD: ☐ BOAT ☐ WADE ☐ L. LINE ☐ OTHER

DISTANCE: ☐ 0.6 Km ☐ 0.2 Km ☐ 0.15 Km ☐ 0.12 Km ☐ OTHER

STAGE: ☐ HIGH ☐ NORMAL ☐ LOW ☐ DRY

CLARITY: ☐ < 20 cm ☐ 20-40 cm ☐ 40-70 cm ☐ > 70 cm/ CTB ☐ SECCHI DEPTH ___ cm

CANOPY: ___ meters ___ cm (circle one) ☐ > 85%- OPEN ☐ 55%-<85% ☐ 30%-<55% ☐ 10%-<30% ☐ <10%- CLOSED

B) AESTHETIC: ☐ NUISANCE ALGAE/PHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CSOS/SSOS/OUTFALLS

C) REC: ION POOL: ☐ >1.0M ☐ >1M AREA DEPTH

D) MAINTENANCE: PUBLIC / PRIVATE / BOTH / NA; ACTIVE / HISTORIC / BOTH / NA; YOUNG-SUCCESSION-OLD; SPRAY / SNAG / REMOVED; MODIFIED / DIPPED OUT / NA; LEVEED / ONE SIDED; RELOCATED / CUTOFFS; MOVING-BEDLOAD-STABLE; ARMOURED / SLUMPS; ISLANDS / SCOURED; IMPOUNDED / DESILTED; FLOOD CONTROL / DRAINAGE

E) ISSUES: WWTP / CSO / NPDES / INDUSTRY; HARDENED / URBAN / DIRT&GRIME; CONTAMINATED / LANDFILL; BMPs-CONSTRUCTION-SEDIMENT; LOGGING / IRRIGATION / COOLING; BANK / EROSION / SURFACE; FALSE BANK / MANURE / LAGOON; WASH H2O / TILE / H2O TABLE; ACID / MINE / QUARRY / FLOW; NATURAL / WETLAND / STAGNANT; RIPARIAN / CROP / CATTLE; ATMOSPHERE / DATA PAUCITY

F) MEASUREMENTS: Circle sure & COMMENT

Tree: Le; entrench. ratio; floodprone x width; bankfull max. depth; W/D ratio; bankfull x depth; bankfull width; Σ bankfull width; max. depth; x depth; Σ width

Stream 58, Modified Class 1

Stream 58, Modified Class 1

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 29

SITE NAME/LOCATION: Harrison GH

hh-bae-032416-02 SITE NUMBER 02 RIVER BASIN ___ DRAINAGE AREA (mi²) ___

LENGTH OF STREAM REACH (ft) ___ LAT. ___ LONG. ___ RIVER CODE ___ RIVER MILE ___

DATE 3/24/16 SCORER BAE/CMS COMMENTS Intermittent

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: broken dg tile

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]	10
☐☐	BOULDER (>256 mm) [10 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-255 mm) [12 pts]	10	☐☐	CLAY or HARDPAN [0 pt]	
☐☐	GRAVEL (2-64 mm) [9 pts]	40	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]	40	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: (A) 15 — (B) 4

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

HHEI Metric Points — Substrate Max = 40: 19 — 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]

Pool Depth Max = 30: 5

COMMENTS ___ MAXIMUM POOL DEPTH (centimeters): 21

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

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

Bankfull Width Max=30: 5

COMMENTS ___ AVERAGE BANKFULL WIDTH (meters): 3.1

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	
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 ☒ Flat to Moderate ☐ Moderate ☐ Moderate to Severe ☐ Severe

PHWH Form Page - 1

HH-BAE-032416-02

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 ___ NRCS Soil Map Page ___ NRCS Soil Map Stream Order ___

County ___ Township / City ___

MISCELLANEOUS

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

Photograph Information ___

Elevated Turbidity? (Y/N) N Canopy (% open) 50

Were samples collected for water chemistry? (Y/N) N (Note: no 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 aspects ___

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)

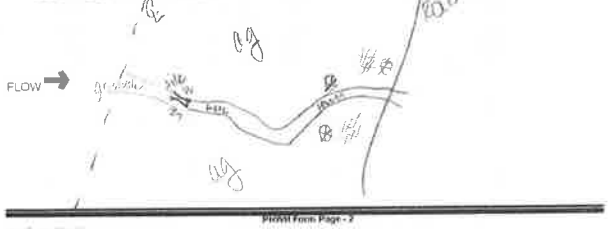
Fish Observed? (Y/N) ___ Voucher? (Y/N) ___ Salamanders Observed? (Y/N) ___ Voucher? (Y/N) ___

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



PHWH Form Page - 2

Stream 59 Good Warmwater

Good Warmwater — (OH-BAO-032416-01)

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 60

Stream & Location: (OH-BAO-032416-01) AEP Harrison-Good Hope **RM:** ____ **Date:** 03/24/16

Scorers Full Name & Affiliation: B. Otto / Acomp / JBL / ...

River Code: - - **STORET #:** **Lat./ Long.:** 18 . Office verified location ☐

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☒ COBBLE [8]	10	50	☐☐ MUCK [2]		
☐☐ GRAVEL [7]	20	30	☐☐ SILT [2]	20	10
☐☒ SAND [6]	50	10	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments 3 14

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ☒ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: SILT ☐ HEAVY [-2] ☒ MODERATE [-1] ☐ NORMAL [0] ☐ FREE [1]; EMBEDDEDNESS ☐ EXTENSIVE [-2] ☒ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

-2

Substrate 13 Maximum 20

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1] — POOLS > 70cm [2] — OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1] — 1 ROOTWADS [1] — 1 AQUATIC MACROPHYTES [1]
SHALLOWS (IN SLOW WATER) [1] — BOULDERS [1] — LOGS OR WOODY DEBRIS [1]
1 ROOTMATS [1]

AMOUNT Check ONE (Or 2 & average): ☐ EXTENSIVE >75% [11] ☒ MODERATE 25-75% [7] ☐ SPARSE 5-<25% [3] ☐ NEARLY ABSENT <5% [1]

Comments

Cover 12 Maximum 20

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY: ☐ HIGH [4] ☒ MODERATE [3] ☐ LOW [2] ☐ NONE [1]
DEVELOPMENT: ☐ EXCELLENT [7] ☒ GOOD [5] ☐ FAIR [3] ☐ POOR [1]
CHANNELIZATION: ☐ NONE [6] ☒ RECOVERED [4] ☐ RECOVERING [3] ☐ RECENT OR NO RECOVERY [1]
STABILITY: ☐ HIGH [3] ☒ MODERATE [2] ☐ LOW [1]

Comments 3 5 4 2

Channel 14 Maximum 20

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average) River right looking downstream

EROSION (L R): ☐☐ NONE / LITTLE [3] ☐☒ MODERATE [2] ☒☐ HEAVY / SEVERE [1]
RIPARIAN WIDTH (L R): ☐☐ WIDE > 50m [4] ☐☐ MODERATE 10-50m [3] ☐☐ NARROW 5-10m [2] ☐☒ VERY NARROW < 5m [1] ☒☐ NONE [0]
FLOOD PLAIN QUALITY (L R): ☐☐ FOREST, SWAMP [3] ☐☐ SHRUB OR OLD FIELD [2] ☐☐ RESIDENTIAL, PARK, NEW FIELD [1] ☐☐ FENCED PASTURE [1] ☒☒ OPEN PASTURE, ROWCROP [0] ☐☐ CONSERVATION TILLAGE [1] ☐☐ URBAN OR INDUSTRIAL [0] ☐☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments 1.5 .5

Riparian 2 Maximum 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!): ☐ > 1m [6] ☐ 0.7-<1m [4] ☒ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]
CHANNEL WIDTH Check ONE (Or 2 & average): ☒ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH > RIFFLE WIDTH [0]
CURRENT VELOCITY Check ALL that apply: ☐ TORRENTIAL [-1] ☐ VERY FAST [1] ☐ FAST [1] ☐ MODERATE [1] ☐ SLOW [1] ☐ INTERSTITIAL [-1] ☐ INTERMITTENT [-2] ☐ EDDIES [1] Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Comments 2 2 1

Pool / Current 5 Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH: ☐ BEST AREAS > 10cm [2] ☒ BEST AREAS 5-10cm [1] ☐ BEST AREAS < 5cm [metric=0]
RUN DEPTH: ☐ MAXIMUM > 50cm [2] ☒ MAXIMUM < 50cm [1]
RIFFLE / RUN SUBSTRATE: ☒ STABLE (e.g., Cobble, Boulder) [2] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]
RIFFLE / RUN EMBEDDEDNESS: ☐ NONE [2] ☐ LOW [1] ☒ MODERATE [0] ☐ EXTENSIVE [-1]

Comments 1 1 2 0

Riffle / Run 4 Maximum 8

6] GRADIENT (3.1 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]
DRAINAGE AREA (11.58 mi²)

%POOL: 20 %GLIDE: %RUN: 30 %RIFFLE: 50

Gradient 8 Maximum 10

EPA 4520 06/16/06

Stream 59 Good Warmwater

A] SAMPLED REACH Check ALL that apply

METHOD: ☐ BOAT ☐ WADE ☐ L LINE ☐ OTHER
STAGE (1st sample pass 2nd): ☐ HIGH ☐ UP ☒ NORMAL ☐ LOW ☐ DRY
DISTANCE: ☐ 0.5 Km ☐ 0.2 Km ☐ 0.15 Km ☐ 0.12 Km ☐ OTHER ___ meters
CLARITY (1st sample pass 2nd): ☐ < 20 cm ☐ 20-<40 cm ☐ 40-70 cm ☐ > 70 cm/ CTB ☐ SECCHI DEPTH 1st ___ cm 2nd ___ cm
CANOPY: ☐ > 85%- OPEN ☒ 55%-<85% ☐ 30%-<55% ☐ 10%-<30% ☐ <10%- CLOSED

C] REC

Comment RE: Reach consistency/ Is reach typical of steam?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

Perennial
MPG = 24"
BFW = 10'

B] AESTHETIC: ☒ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☐ EXCESS TURBIDITY ☐ DISCOLORATION ☐ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CSOs/SSOs/OUTFALLS

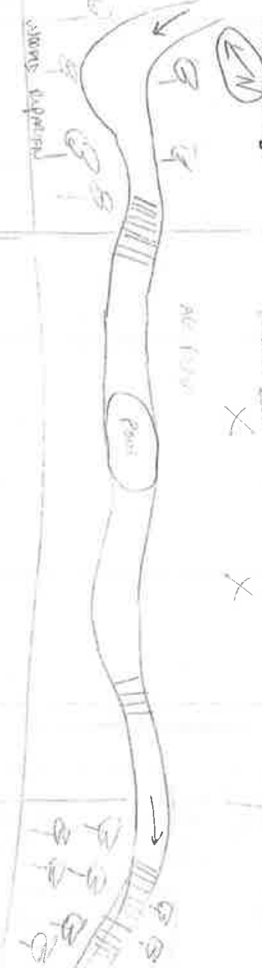
ION AREA DEPTH POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE Circle some & COMMENT: PUBLIC / PRIVATE / BOTH / NA; ACTIVE / HISTORIC / BOTH / NA; YOUNG-SUCCESSION-OLD; SPRAY / SNAG / REMOVED; MODIFIED / DIPPED OUT / NA; LEVEED / ONE SIDED; RELOCATED / CUTOFFS; MOVING-BEDLOAD-STABLE; ARMOURED / SLUMPS; ISLANDS / SCOURED; IMPOUNDED / DESICCATED; FLOOD CONTROL / DRAINAGE

E] ISSUES: WWTP / CSO / NPDES / INDUSTRY; HARDENED / URBAN / DIRT&GRIME; CONTAMINATED / LANDFILL; BMPs-CONSTRUCTION-SEDIMENT; LOGGING / IRRIGATION / COOLING; BANK / EROSION / SURFACE; FALSE BANK / MANURE / LAGOON; WASH H_2O / TILE / H_2O TABLE; ACID / MINE / QUARRY / FLOW; NATURAL / WETLAND / STAGNANT; PARK / GOLF / LAWN / HOME; ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS: x̄ width — 10'; x̄ depth; max. depth — 24+; x̄ bankfull width; bankfull x̄ depth; W/D ratio; bankfull max. depth; floodprone x² width; entrench. ratio; Le; Tree:

Stream Drawing:



Stream 60, Modified Class 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 33

SITE NAME/LOCATION AEP Good Hope-Harrison
SITE NUMBER ___ RIVER BASIN ___ DRAINAGE AREA (mi²) ___
LENGTH OF STREAM REACH (ft) ___ LAT. ___ LONG. ___ RIVER CODE ___ RIVER MILE ___
DATE 03/24/16 SCORER BAO/JBL COMMENTS Intermittent; hh-bao-032416-04

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 — riparian cut w/in ROW

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). 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]	0%	☑☐	SILT [3 pt]	40%
☐☐	BOULDER (>256 mm) [16 pts]	0%	☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	15%
☐☐	BEDROCK [16 pt]	0%	☐☐	FINE DETRITUS [3 pts]	0%
☐☐	COBBLE (65-256 mm) [12 pts]	0%	☐☐	CLAY or HARDPAN [0 pt]	0%
☐☐	GRAVEL (2-64 mm) [9 pts]	10%	☐☐	MUCK [0 pts]	0%
☐☑	SAND (<2 mm) [6 pts]	35%	☐☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

HHEI Metric Points — Substrate Max = 40: 13 (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 In Inches MAXIMUM POOL DEPTH (centimeters): 4

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 (> 9' 7" - 4' 8") [20 pts] ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ☑ ≤ 1.0 m (<=3' 3") [5 pts]
COMMENTS in feet AVERAGE BANKFULL WIDTH (meters): 2.50

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): ☐☐ Wide >10m ☑☑ Moderate 5-10m ☐☐ Narrow <5m ☐☐ None

FLOODPLAIN QUALITY (Most Predominant per Bank) (L R): ☐☐ Mature Forest, Wetland ☑☑ Immature Forest, Shrub or Old Field ☐☐ Residential, Park, New Field ☐☐ Fenced Pasture ☐☐ 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 intermittent

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)

Stream 60, Modified Class 2

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: ___ NRCS Soil Map Page: ___ NRCS Soil Map Stream Order ___
County: Franklin Township / City: ___

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: ___ Quantity: 0.00
Photograph Information: 2 photos
Elevated Turbidity? (Y/N): Y Canopy (% open): 70%
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: ___

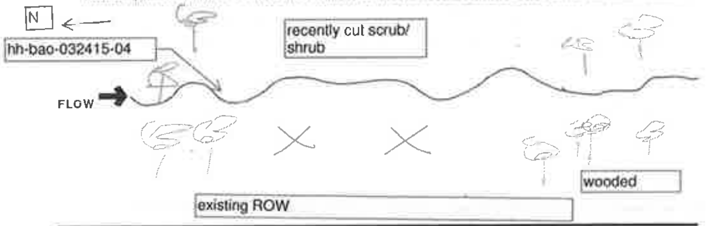
BIOTIC EVALUATION

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: ___

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



[redacted] [redacted]

Stream 61, Modified Class2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 33

SITE NAME/LOCATION: AEP Good Hope-Harrison
SITE NUMBER: RIVER BASIN: DRAINAGE AREA (mi²):
LENGTH OF STREAM REACH (ft): LAT: LONG: RIVER CODE: RIVER MILE:
DATE: 03/24/16 SCORER: BAO/JBL COMMENTS: intermittent; hh-bao-032416-03

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
riparian cut w/in ROW

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). 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]	0%	☑☐	SILT [3 pt]	40%
☐☐	BOULDER (>256 mm) [16 pts]	0%	☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	15%
☐☐	BEDROCK [16 pt]	0%	☐☐	FINE DETRITUS [3 pts]	0%
☐☐	COBBLE (65-256 mm) [12 pts]	0%	☐☐	CLAY or HARDPAN [0 pt]	0%
☐☐	GRAVEL (2-64 mm) [9 pts]	20%	☐☐	MUCK [0 pts]	0%
☐☑	SAND (<2 mm) [6 pts]	25%	☐☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0.00% (A) (B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

HHEI Metric Points — Substrate Max = 40: 13 (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: in inches MAXIMUM POOL DEPTH (centimeters): 3

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 (> 5' 7" - 4' 8") [20 pts]
☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ ≤ 1.0 m (<=3' 3") [5 pts]

COMMENTS: in feet AVERAGE BANKFULL WIDTH (meters): 2.00

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: intermittent

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)

Stream 61, Modified Class2

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: NRCS Soil Map Page: NRCS Soil Map Stream Order:
County: Franklin Township / City:

MISCELLANEOUS

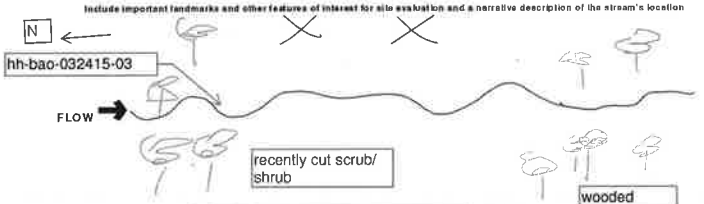
Base Flow Conditions? (Y/N): Y Date of last precipitation: Quantity: 0.00
Photograph Information: 2 photos
Elevated Turbidity? (Y/N): Y Canopy (% open): 70%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C): Dissolved 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:

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



Save as pdf Reset Form

Stream 62, Modified Class 1

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 23

SITE NAME/LOCATION: AEP Good Hope-Harrison
SITE NUMBER: RIVER BASIN: DRAINAGE AREA (mi²):
LENGTH OF STREAM REACH (ft): LAT: LONG: RIVER CODE: RIVER MILE:
DATE: 03/24/16 SCORER: BAO/JBL COMMENTS: ephemeral; hh-bao-032416-02

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
regularly maintained lawn

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). 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]	0%	☑☐	SILT [3 pt]	40%
☐☐	BOULDER (>256 mm) [16 pts]	0%	☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	15%
☐☐	BEDROCK [16 pt]	0%	☐☐	FINE DETRITUS [3 pts]	0%
☐☐	COBBLE (65-256 mm) [12 pts]	0%	☐☐	CLAY or HARDPAN [0 pt]	0%
☐☐	GRAVEL (2-64 mm) [9 pts]	20%	☐☐	MUCK [0 pts]	0%
☐☑	SAND (<2 mm) [6 pts]	25%	☐☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0.00% (A) (B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

HHEI Metric Points — Substrate Max = 40: 13 (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: in inches MAXIMUM POOL DEPTH (centimeters): 1

Pool Depth Max = 30: 5

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 (> 5' 7" - 4' 8") [20 pts]
☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ ≤ 1.0 m (<=3' 3") [5 pts]

COMMENTS: in feet AVERAGE BANKFULL WIDTH (meters): 1.00

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)

Stream 62, Modified Class 1

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: NRCS Soil Map Page: NRCS Soil Map Stream Order:
County: Franklin Township / City:

MISCELLANEOUS

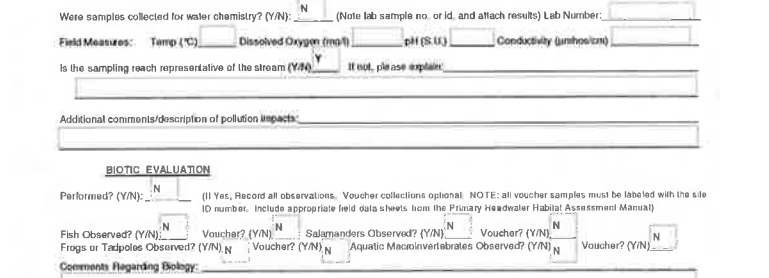
Base Flow Conditions? (Y/N): Y Date of last precipitation: Quantity: 0.00
Photograph Information: 2 photos
Elevated Turbidity? (Y/N): Y Canopy (% open): 90%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C): Dissolved 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:

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 63, Modified Class 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 33

SITE NAME/LOCATION: AEP Good Hope-Harrison

SITE NUMBER: ____ RIVER BASIN: ____ DRAINAGE AREA (mi²): ____

LENGTH OF STREAM REACH (ft): ____ LAT.: ____ LONG.: ____ RIVER CODE: ____ RIVER MILE: ____

DATE: 03/24/16 SCORER: BAO/JBL COMMENTS: Ephemeral; hh-bao-032416-01

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 32). 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]	0%	☑	SILT [3 pt]	40%
☐	BOULDER (>256 mm) [16 pts]	0%	☐	LEAF PACK/WOODY DEBRIS [3 pts]	15%
☑	BEDROCK [16 pt]	0%	☐	FINE DETRITUS [3 pts]	0%
☐	COBBLE (65-256 mm) [12 pts]	0%	☐	CLAY or HARDPAN [0 pt]	0%
☐	GRAVEL (2-64 mm) [9 pts]	15%	☐	MUCK [0 pts]	0%
☑	SAND (<2 mm) [6 pts]	30%	☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0.00% (A) (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

HHEI Metric Points — Substrate Max = 40: 13 (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: in inches MAXIMUM POOL DEPTH (centimeters): 3

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 (> 5' 7" - 9' 7") [20 pts]
☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☑ ≤ 1.0 m (<=3' 3") [5 pts]

COMMENTS: in feet AVERAGE BANKFULL WIDTH (meters): 1.00

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: ephemeral

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)

October 24, 2002 Revision — PHWH Form Page - 1

Stream 63, Modified Class 2

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: ____ NRCS Soil Map Page: ____ NRCS Soil Map Stream Order: ____

County: Hocking Township / City: ____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: ____ Quantity: 0.00

Photograph Information: 2 photos

Elevated Turbidity? (Y/N): Y Canopy (% open): 90%

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: pasture runoff, algea concerns

BIOTIC EVALUATION

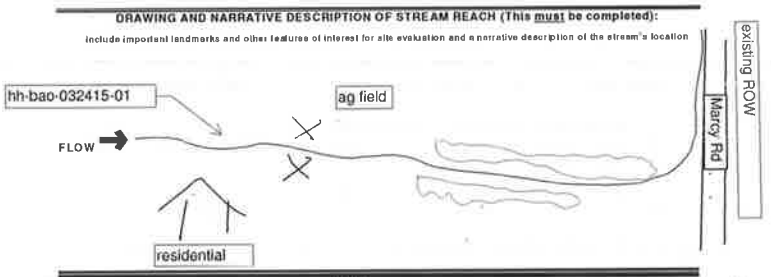
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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): 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



PHWH Form Page - 2

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Stream 64, Modified Class 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 54

SITE NAME/LOCATION: AEP Good Hope-Harrison

SITE NUMBER: ____ RIVER BASIN: ____ DRAINAGE AREA (mi²): ____

LENGTH OF STREAM REACH (ft): ____ LAT.: ____ LONG.: ____ RIVER CODE: ____ RIVER MILE: ____

DATE: 03/25/16 SCORER: BAO/JBL COMMENTS: Intermittent; hh-bao-032516-01

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 32). 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]	0%	☑	SILT [3 pt]	30%
☐	BOULDER (>256 mm) [16 pts]	0%	☐	LEAF PACK/WOODY DEBRIS [3 pts]	5%
☐	BEDROCK [16 pt]	0%	☐	FINE DETRITUS [3 pts]	0%
☐	COBBLE (65-256 mm) [12 pts]	10%	☐	CLAY or HARDPAN [0 pt]	0%
☐	GRAVEL (2-64 mm) [9 pts]	20%	☐	MUCK [0 pts]	0%
☑	SAND (<2 mm) [6 pts]	35%	☐	ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 10.00% (A) (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 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: in inches MAXIMUM POOL DEPTH (centimeters): 12

Pool Depth Max = 30: 20

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 (> 5' 7" - 9' 7") [20 pts]
☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ ≤ 1.0 m (<=3' 3") [5 pts]

COMMENTS: in feet AVERAGE BANKFULL WIDTH (meters): 8.00

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 (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: intermittent

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)

October 24, 2002 Revision — PHWH Form Page - 1

Stream 64, Modified Class 2

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: ____ NRCS Soil Map Page: ____ NRCS Soil Map Stream Order: ____

County: Hocking Township / City: ____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: ____ Quantity: 0.00

Photograph Information: 2 photos

Elevated Turbidity? (Y/N): Y Canopy (% open): 60%

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: ag runoff, algea concerns

BIOTIC EVALUATION

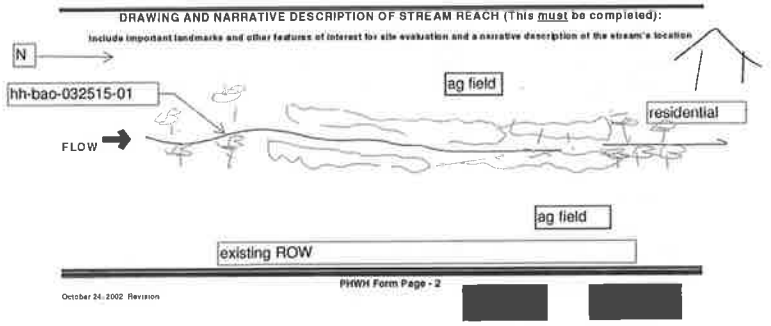
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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): 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



PHWH Form Page - 2

[redacted] [redacted]

Stream 65 Poor Warmwater

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 35

Stream & Location: ALP Harrison Road Hope — RM: ___ Date: 02/22/06

Scorers Full Name & Affiliation: M. Thomayer, AECOM

River Code: - - STORET #: ___ Lat./Long.: ___ Office verified location ☐

1) SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ BLDR/SLABS [10]			☐ HARDPAN [4]		
☐ BOULDER [9]			☐ DETRITUS [3]		
☐ COBBLE [8]			☒ MUCK [2]	75	
☐ GRAVEL [7]			☐ SILT [2]		
☐ SAND [6]	10		☐ ARTIFICIAL [0]		

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☑ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: ☒ HEAVY [-2] ☐ MODERATE [-1] ☐ NORMAL [0] ☐ FREE [1]

SILT / EMBEDDEDNESS: ☒ EXTENSIVE [-2] ☐ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

Substrate: 0 (Maximum 20)

Comments

2) INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-H ghest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

☐ UNDERCUT BANKS [1] ☐ OVERHANGING VEGETATION [1] ☐ SHALLOWS (IN SLOW WATER) [1] ☐ ROOTMATS [1]

☐ POOLS > 70cm [2] ☐ ROOTWADS [1] ☐ BOULDERS [1]

☐ OXBOWS, BACKWATERS [1] ☐ AQUATIC MACROPHYTES [1] ☐ LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONE (Or 2 & average)): ☐ EXTENSIVE >75% [11] ☐ MODERATE 25-75% [7] ☐ SPARSE 5-25% [3] ☐ NEARLY ABSENT <5% [1]

Cover Maximum 20: 5

Comments

3) CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY: ☐ HIGH [4] ☐ MODERATE [3] ☐ LOW [2] ☐ NONE [1]

DEVELOPMENT: ☐ EXCELLENT [7] ☐ GOOD [5] ☐ FAIR [3] ☐ POOR [1]

CHANNELIZATION: ☐ NONE [6] ☐ RECOVERED [4] ☐ RECOVERING [3] ☐ RECENT OR NO RECOVERY [1]

STABILITY: ☐ HIGH [3] ☐ MODERATE [2] ☐ LOW [1]

Comments: Channelized

Channel Maximum 20: 15

4) BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION: ☐ NONE / LITTLE [3] ☐ MODERATE [2] ☐ HEAVY / SEVERE [1]

RIPARIAN WIDTH: ☐ WIDE > 50m [4] ☐ MODERATE 10-50m [3] ☐ NARROW 5-10m [2] ☐ VERY NARROW < 5m [1] ☐ NONE [0]

FLOOD PLAIN QUALITY: ☐ FOREST, SWAMP [3] ☐ SHRUB OR OLD FIELD [2] ☐ RESIDENTIAL, PARK, NEW FIELD [1] ☐ FENCED PASTURE [1] ☐ OPEN PASTURE, ROWCROP [0]

☐ CONSERVATION TILLAGE [1] ☐ URBAN OR INDUSTRIAL [0] ☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10: 1

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY)): ☐ > 1m [6] ☐ 0.7-<1m [4] ☒ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average)): ☒ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH > RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply): ☐ TORRENTIAL [-1] ☒ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☐ FAST [1] ☐ INTERMITTENT [-2] ☐ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Pool / Current Maximum 12: 5

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH: ☐ BEST AREAS > 10cm [2] ☐ BEST AREAS 5-10cm [1] ☐ BEST AREAS < 5cm (metric=0)

RUN DEPTH: ☐ MAXIMUM > 50cm [2] ☒ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE: ☐ STABLE (e.g., Cobble, Boulder) [2] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☒ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS: ☐ NONE [2] ☐ LOW [1] ☐ MODERATE [0] ☒ EXTENSIVE [-1]

Riffle / Run Maximum 8: 1

Comments

6) GRADIENT (16 ft/mi)
DRAINAGE AREA (3.52 mi²)

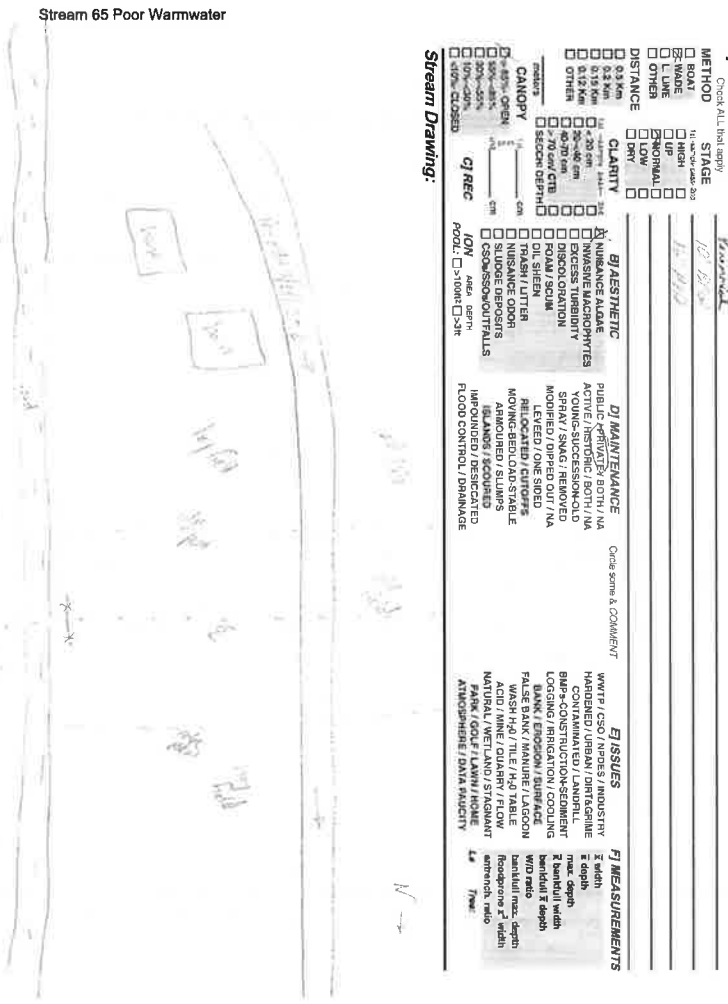
☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

%POOL: 5 %GLIDE: 95 %RUN: 0 %RIFFLE: 5

Gradient Maximum 10: 10

EPA 4520 06/16/06

Stream 65 Poor Warmwater



Stream 67 Good Warmwater

OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 55.5

Stream & Location: Good Hope-Harrison, QH-MDT-032416-01 — RM: ___ Date: 03/24/16

Scorers Full Name & Affiliation: Matt Thomayer/Brian Robertson, AECOM

River Code: - - STORET #: ___ Lat./Long.: ___ Office verified location ☐

1) SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ BLDR/SLABS [10]			☐ HARDPAN [4]		
☐ BOULDER [9]			☐ DETRITUS [3]		
☐ COBBLE [8]		30	☐ MUCK [2]		
☑ GRAVEL [7]	15	35	☐ SILT [2]	40	
☑ SAND [6]	35	35	☐ ARTIFICIAL [0]		
☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☑ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: ☐ HEAVY [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ FREE [1]

SILT / EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☑ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

Substrate: 12 (Maximum 20)

Comments

2) INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

☐ UNDERCUT BANKS [1] ☐ OVERHANGING VEGETATION [1] ☐ SHALLOWS (IN SLOW WATER) [1] ☐ ROOTMATS [1]

☐ POOLS > 70cm [2] ☐ ROOTWADS [1] ☐ BOULDERS [1]

☐ OXBOWS, BACKWATERS [1] ☐ AQUATIC MACROPHYTES [1] ☐ LOGS OR WOODY DEBRIS [1]

AMOUNT (Check ONE (Or 2 & average)): ☐ EXTENSIVE >75% [11] ☐ MODERATE 25-75% [7] ☐ SPARSE 5-25% [3] ☐ NEARLY ABSENT <5% [1]

Cover Maximum 20: 11

Comments

3) CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY: ☐ HIGH [4] ☐ MODERATE [3] ☑ LOW [2] ☐ NONE [1]

DEVELOPMENT: ☐ EXCELLENT [7] ☑ GOOD [5] ☐ FAIR [3] ☐ POOR [1]

CHANNELIZATION: ☐ NONE [6] ☐ RECOVERED [4] ☑ RECOVERING [3] ☐ RECENT OR NO RECOVERY [1]

STABILITY: ☐ HIGH [3] ☐ MODERATE [2] ☑ LOW [1]

Channel Maximum 20: 11

Comments

4) BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION: ☐ NONE / LITTLE [3] ☐ MODERATE [2] ☑ HEAVY / SEVERE [1]

RIPARIAN WIDTH: ☑ WIDE > 50m [4] ☐ MODERATE 10-50m [3] ☐ NARROW 5-10m [2] ☐ VERY NARROW < 5m [1] ☐ NONE [0]

FLOOD PLAIN QUALITY: ☐ FOREST, SWAMP [3] ☐ SHRUB OR OLD FIELD [2] ☐ RESIDENTIAL, PARK, NEW FIELD [1] ☐ FENCED PASTURE [1] ☑ OPEN PASTURE, ROWCROP [0]

☐ CONSERVATION TILLAGE [1] ☐ URBAN OR INDUSTRIAL [0] ☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10: 5.5

Comments: T-Line ROW overhead with young growth established in ROW and 2nd Growth outside.

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY)): ☐ > 1m [6] ☑ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☑ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average)): ☐ POOL WIDTH > RIFFLE WIDTH [2] ☑ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH > RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply): ☐ TORRENTIAL [-1] ☑ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☑ FAST [1] ☐ INTERMITTENT [-2] ☑ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential: Primary Contact / Secondary Contact (circle one and comment on back)

Pool / Current Maximum 12: 5

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH: ☐ BEST AREAS > 10cm [2] ☑ BEST AREAS 5-10cm [1] ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH: ☑ MAXIMUM > 50cm [2] ☑ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE: ☐ STABLE (e.g., Cobble, Boulder) [2] ☑ MOD. STABLE (e.g., Large Gravel) [1] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS: ☐ NONE [2] ☐ LOW [1] ☑ MODERATE [0] ☐ EXTENSIVE [-1]

Riffle / Run Maximum 8: 3

Comments

6) GRADIENT (10.09 ft/mi)
DRAINAGE AREA (5.11 mi²)

☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

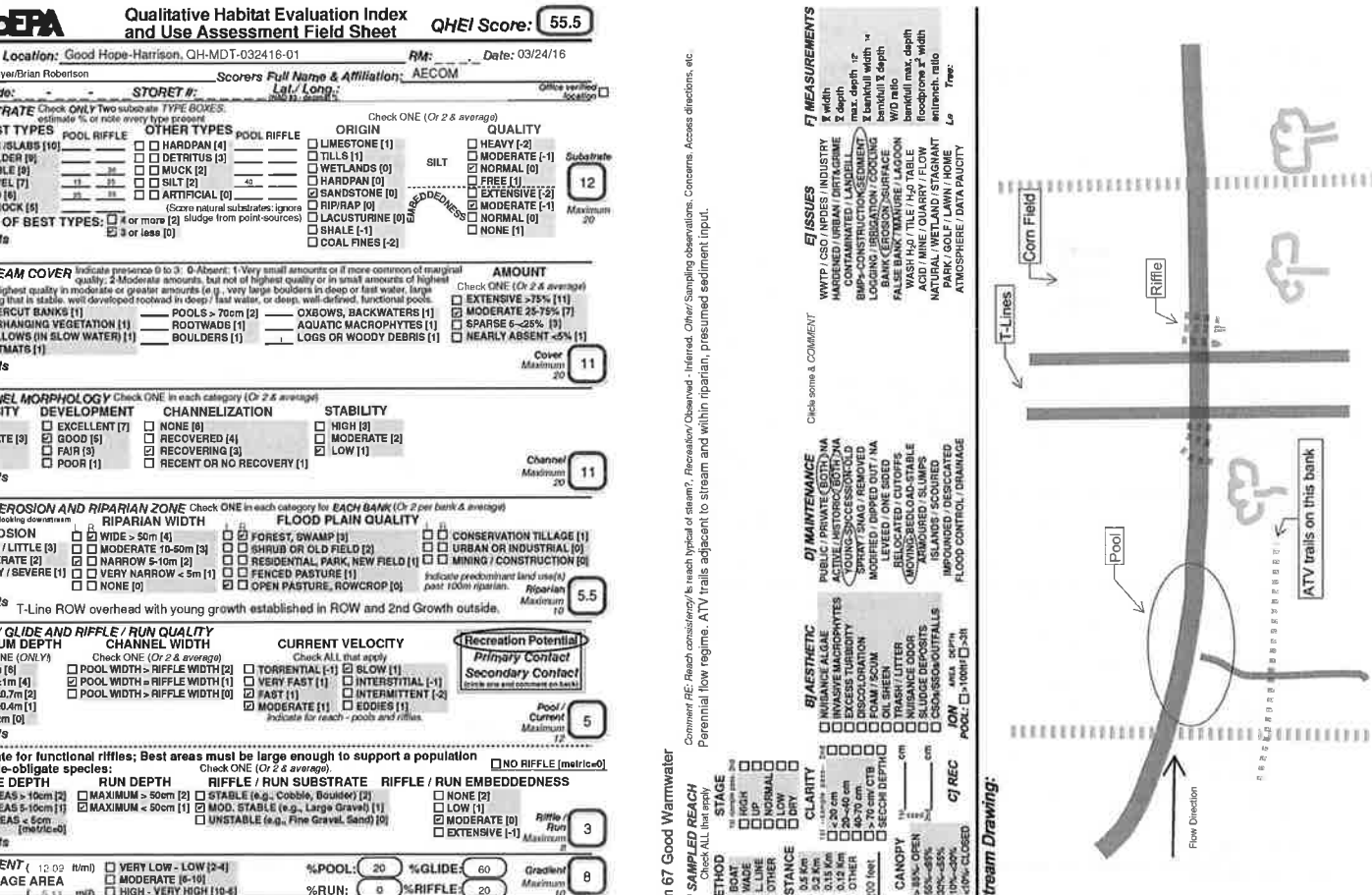
%POOL: 20 %GLIDE: 60 %RUN: 0 %RIFFLE: 20

Gradient Maximum 10: 8

EPA 4520 06/16/06

Stream 67 Good Warmwater

*Comment RE: Reach consistency/*is reach typical of steam?, *Recreation/ Observed - Inferred, Other/* Sampling observations, Concerns, Access directions, etc.
Perennial flow regime. ATV trails adjacent to stream and within riparian, presumed sediment input.



Stream 68, Class 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 46

SITE NAME/LOCATION: Mill Run - Hoover Road Tribs
Headwaters 1 SITE NUMBER: 03 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____
LENGTH OF STREAM REACH (ft): 200ft LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____
DATE: 29 Nov 16 SCORER: MDT, BCK COMMENTS: Intermittent

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 pts]	35
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	10	☐	CLAY or HARDPAN [0 pt]	
☒	GRAVEL (2-64 mm) [9 pts]	20	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	15	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 10 (A): 12
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: _____
TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points — Substrate Max = 40: 16 (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): 3"

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

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): 1'

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 (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: Intermittent

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 (<0.2 m/km) ☒ Flat to Moderate ☐ Moderate (0.2 - 1.0 m/km) ☐ Moderate to Severe ☐ Severe (>1.0 m/km)

PHWH Form Page - 1

Stream 68, Class 2

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: Unknown Quantity: Unknown
Photograph Information: 2
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: _____

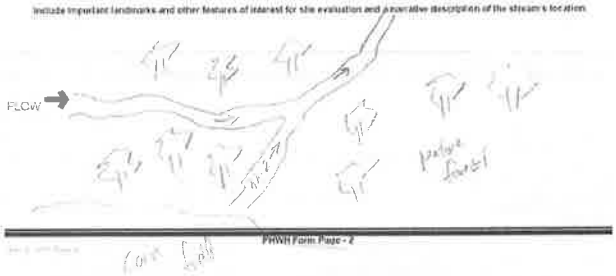
BIOTIC EVALUATION

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): ___ 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



PHWH Form Page - 2

Stream 69, Modified Class 1

OhioEPA Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION: Mill Run - Hoover Road Tribs
Headwaters 2 SITE NUMBER: 02 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____
LENGTH OF STREAM REACH (ft): 150ft LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____
DATE: 29 Nov 16 SCORER: MDT, BCK COMMENTS: Ephemeral

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
Signs of channelization and drain tiles

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 pts]	55
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	5	☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]	15	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 5 (A): 3
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: Mud, Silt
TOTAL NUMBER OF SUBSTRATE TYPES: 2 (B)

HHEI Metric Points — Substrate Max = 40: 7 (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: Mud, Silt MAXIMUM POOL DEPTH (centimeters): 2"

Pool Depth Max = 30: 5

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

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

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): 1'

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	
☐	☐	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: Ephemeral

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 (<0.2 m/km) ☐ Flat to Moderate ☐ Moderate (0.2 - 1.0 m/km) ☒ Moderate to Severe ☐ Severe (>1.0 m/km)

PHWH Form Page - 1

Stream 69, Modified Class 1

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: Unknown Quantity: Unknown
Photograph Information: 2
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) _____ 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: _____

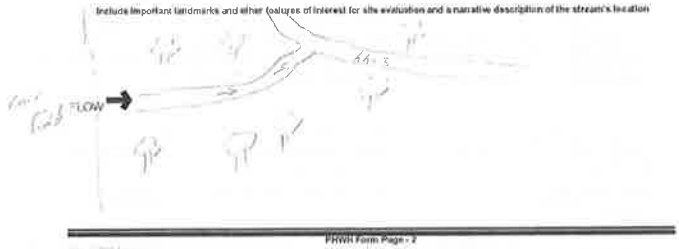
BIOTIC EVALUATION

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): ___
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



PHWH Form Page - 2

Stream 70, Modified Class 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 35

SITE NAME/LOCATION: [illegible] SITE NUMBER: 01 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): 200 LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 29 Apr 2016 SCORER: [illegible] COMMENTS: Intermittent

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
Channelized

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]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	15
☐☐	COBBLE (65-256 mm) [12 pts]		☐☐	CLAY or HARDPAN [0 pt]	
☒☐	GRAVEL (2-64 mm) [8 pts]	30	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]		☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock: 0 (A) 12 (B) 3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 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] ☒ > 5 cm - 10 cm [15 pts]
☐ > 22.5 - 30 cm [30 pts] ☐ < 5 cm [5 pts]
☐ > 10 - 22.5 cm [25 pts] ☐ NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth Max = 30: 15

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): 14"

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

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

Bankfull Width Max=30: 5

COMMENTS: Level AVERAGE BANKFULL WIDTH (meters): 2'

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 ☐ Moist Channel, isolated pools, no flow (intermittent)
☐ Subsurface flow with isolated pools (interstitial) ☐ Dry channel, no water (Ephemeral)
COMMENTS: Intermittent

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 (< 5 ft/mile) ☐ Flat to Moderate ☐ Moderate (5-10 ft/mile) ☐ Moderate to Severe ☐ Severe (> 40 ft/mile)

PHWH Form Page - 1

Stream 70, Modified Class 2

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

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

Photograph Information: 2

Elevated Turbidity? (Y/N): N Canopy (% open): 100

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 (umhos/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): ___ 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

PHWH Form Page - 2

Stream 71, Modified Class 2

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 49

SITE NAME/LOCATION: [illegible] SITE NUMBER: 01 RIVER BASIN: _____ DRAINAGE AREA (mi²): _____

LENGTH OF STREAM REACH (ft): 200 LAT: _____ LONG: _____ RIVER CODE: _____ RIVER MILE: _____

DATE: 23 Nov 2016 SCORER: [illegible] COMMENTS: Intermittent

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
channelized along property line

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]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	5	☐☐	CLAY or HARDPAN [0 pt]	
☒☐	GRAVEL (2-64 mm) [8 pts]	70	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]	15	☐☐	ARTIFICIAL [3 pts]	

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

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

HHEI Metric Points — Substrate Max = 40: 19; 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] ☐ > 5 cm - 10 cm [15 pts]
☐ > 22.5 - 30 cm [30 pts] ☐ < 5 cm [5 pts]
☒ > 10 - 22.5 cm [25 pts] ☐ NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth Max = 30: 25

COMMENTS: _____ MAXIMUM POOL DEPTH (centimeters): Varies

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

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

Bankfull Width Max=30: 5

COMMENTS: _____ AVERAGE BANKFULL WIDTH (meters): 1.5'

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 ☐ Moist Channel, isolated pools, no flow (intermittent)
☐ Subsurface flow with isolated pools (interstitial) ☐ 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 (< 5 ft/mile) ☐ Flat to Moderate ☐ Moderate (5-10 ft/mile) ☐ Moderate to Severe ☐ Severe (> 40 ft/mile)

PHWH Form Page - 1

Stream 71, Modified Class 2

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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: _____ Township / City: _____

MISCELLANEOUS

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

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 90

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 (umhos/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): ___ 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

PHWH Form Page - 2

Stream 72 Poor Warmwater

OhioEPA — Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 37

Stream & Location: ALP Harrison Coal Haps [illegible] RM: ___ Date: 6/21/06

Scorers Full Name & Affiliation: M Thomas, B Rabe, Tetra Tech

River Code: - - STORET #: Lat./Long.: /8 - Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present. Check ONE (Or 2 & average)

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]			☐☐ MUCK [2]		
☐☐ GRAVEL [7]	60	20	☑☐ SILT [2]	35	10
☐☐ SAND [6]	5	5	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates, ignore silvage from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☐ 3 or less [0]

ORIGIN: ☐ LIMESTONE [1] ☐ TILLS [1] ☐ WETLANDS [0] ☑ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

EMBEDDEDNESS

QUALITY: SILT ☐ HEAVY [-2] ☐ MODERATE [-1] ☑ NORMAL [0] ☐ FREE [1] ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ☐ NORMAL [0] ☐ NONE [1]

Substrate 7 Maximum 20

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	___ POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]	
2 OVERHANGING VEGETATION [1]	___ ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]	
___ SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	___ LOGS OR WOODY DEBRIS [1]	
___ ROOTMATS [1]			

AMOUNT (Check ONE (Or 2 & average)): ☐ EXTENSIVE >75% [11] ☑ MODERATE 25-75% [7] ☐ SPARSE 5-<25% [3] ☐ NEARLY ABSENT <5% [1]

Cover Maximum 20: 7

Comments

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☑ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☑ NONE [1]	☐ POOR [1]	☑ RECENT OR NO RECOVERY [1]	

Channel Maximum 20: 8

Comments

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average) (River right looking downstream)

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]
☑ ☐ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]
	☑ ☑ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]
		☐ ☐ CONSERVATION TILLAGE [1]
		☐ ☐ URBAN OR INDUSTRIAL [0]
		☐ ☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10: 2

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY)): ☐ > 1m [6] ☐ 0.7-<1m [4] ☒ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average)): ☐ POOL WIDTH > RIFFLE WIDTH [2] ☑ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply): ☐ TORRENTIAL [-1] ☐ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☐ FAST [1] ☐ INTERMITTENT [-2] ☑ MODERATE [1] ☐ EDDIES [1] Indicate for mach - pools and riffles.

Recreation Potential: *Primary Contact* / *Secondary Contact* (circle one and comment on back)

Pool / Current Maximum 12: 4

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: ☐ NO RIFFLE [metric=0]

Check ONE (Or 2 & average).

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☒ BEST AREAS 5-10cm [1]	☒ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☒ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☒ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0] ☐ EXTENSIVE [-1]

Riffle / Run Maximum 2: 3

Comments

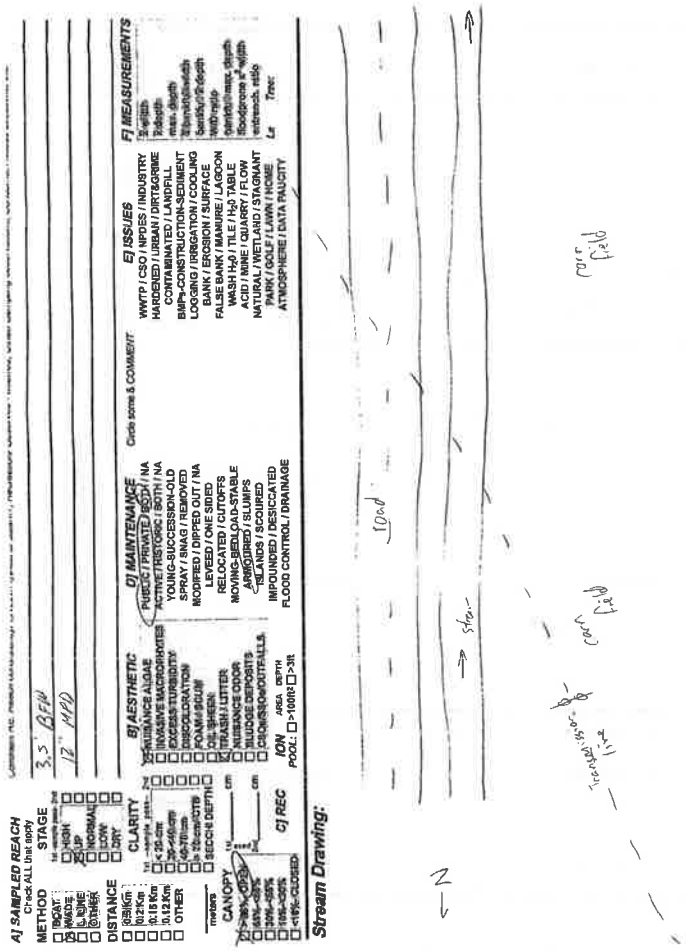
6) GRADIENT (4 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (5.36 mi²)

%POOL: 10 %GLIDE: 5 %RUN: 70 %RIFFLE: 15

Gradient Maximum 10: 1

EPA 4520 05/16/06



Summary: Letter of Notification - Part 8 of 10 electronically filed by Mr. Hector Garcia on behalf of AEP Ohio Transmission Company