

Section 6— Reevaluation Statement #1

Appendix C2: Stream Report

Stream Report For I-69 Section 6 Design Contract 1 In Morgan County, Indiana

DES# 0500430 & 1800324

September 06, 2018





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I. Project Description

In general, the project consists of upgrading existing SR 37 to Interstate standards in Morgan County, Indiana starting just south of the SR 39 interchange in Martinsville, Indiana and ending just south of the existing SR 37 and Morgan Street intersection. The total length of Section 6 Design Contract 1 of the I-69 Section 6 project is approximately 5.5 miles.

The project is located in Morgan County (see Exhibit 1 for general location map). The majority of this project is along the existing SR 37 roadway (see Exhibits 2 and 3). There are 20 jurisdictional streams identified within the proposed I-69 Section 6 Design Contract 1 Permit Limits. Appendix A contains impact site forms for the 20 jurisdictional stream impacts associated with this project. Also included in Appendix A are stream assessment data sheets completed using either the Qualitative Habitat Evaluation Index (QHEI) or the Headwater Habitat Evaluation Index (HHEI). Exhibit 1 attached contain a general project location map and 8-digit HUC map. Exhibit 2 attached contain USGS Topographic maps showing the project location and stream impacts.

II. Section 404 "Waters of the United States," "Waters of the State,"

In 1972 Congress amended the Federal Water Pollution Control Act of 1948 (Clean Water Act) to include Section 404 which regulates the discharge of fill or dredged material into all "waters of the United States." Guidelines for implementation of the Section 404 program were jointly developed by the United States Environmental Protection Agency (USEPA) and the United States Army Corps of Engineers (USACE). Administration of the program, including issuance of discharge permits, is the responsibility of the USACE. The EPA is however "authorized to prohibit the specification (including the withdrawal of specification) of any defined area as a disposal site" as well as "deny or restrict the use of any defined area for specification (including the withdrawal of specification) as a disposal site…" Section 6 Design Contract 1 of the I-69 Project is within the jurisdiction of the USACE Louisville District office.

"Waters of the United States" is an all encompassing term used to include a wide range of both deep water aquatic habitats and special aquatic sites. Special aquatic sites are defined as "geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values" [40 CFR 230.3(q-1)]. Six special aquatic site categories have been identified by the EPA [40 CFR 230.40 - 230.45]:

- (1) sanctuaries and refuges
- (4) vegetated shallows

- (2) wetlands
- (3) mudflats

- (5) coral reefs
- (6) riffle and pool complexes

Streams as defined by the USACE include all natural and/or captured channels that contain a bed and bank and maintain an ordinary high water mark (OHWM). In addition, the USACE may also regulate all natural and/or manmade channels that contain relatively permanent water.

The Indiana Department of Environmental Management (IDEM) regulates "Waters of the State." IDEM is responsible for issuing Water Quality Certifications (WQC) in Indiana. IDEM is charged with maintaining the chemical, physical and biological integrity of Indiana waters through its WQC program. Section 401 of the Clean Water Act requires any applicant for a federal permit through the USACE to conduct any activity that may result in a discharge of pollutants to waters to first obtain a

WQC. If the USACE determines that a federal permit is not needed under Section 404 of the Clean Water Act, authorization by IDEM is still likely needed. This is likely to be the case of "isolated wetlands" where the USACE has determined that it has no basis for federal jurisdiction. IDEM regulates impacts to isolated wetlands under its Isolated Wetlands Regulatory Program (327 IAC 2).

III. Stream Determination Methodology

All channels located with the I-69 Section 6 Design Contract 1 Permit Limits were field reviewed to determine their jurisdictional status. All channels that displayed a bed and bank and maintain and OHWM were identified as jurisdictional streams. In addition, all channels within the Permit Limits that contained relatively permanent waters where also included as jurisdictional streams. All streams that were identified as jurisdictional were assessed for stream quality using either the QHEI or HHEI depending on the size of the stream and the drainage area. Appendix A contain the stream impact site forms and stream assessment forms for the stream impacts within the I-69 Section 6 Design Contract 1 Permit Limits

IV. Preliminary Review

Prior to the on-site investigation, standard sources of information were reviewed to assess the potential for encountering "Waters of the United States" and "Waters of the State," including wetlands, within the proposed Section 6 Design Contract 1 project area.

USGS Topographic Maps

Section 6 Design Contract 1 of the I-69 Project area is located in Morgan County, Indiana. The project area is located on the Martinsville Indiana USGS Quadrangle Maps (See Exhibit 2).

Soil Survey Data

The United States Department of Agriculture Soil Survey of Morgan county, Indiana was consulted to identify mapped drainage patterns.

FEMA Flood Maps

Indiana Department of Natural Resources (IDNR) Division of Water Digital Flood Insurance Rate Maps (FIRM) for Morgan County was reviewed for this project. The FIRM map identified the floodplain areas of 2 streams within the I-69 Section 6 Design Contract 1 Permit Limits (Figure 1). The Indian Creek and Sartor Ditch 100-year floodplains are crossed by the Section 6 Design Contract 1 Permit Limits.

V. Field Investigation

On-site field reviews were conducted in 2015, 2017, and 2018. During the field reviews, the entire I-69 Section 6 Design Contract 1 area was reviewed to identify possible stream impacts. Twenty jurisdictional streams were identified during the field reviews that will be impacted by the Section 6 Design Contract 1 Permit Limits. These streams are located in the Upper White 8-digit watersheds.

VI. Investigation Findings

<u>Streams</u>

A total of 20 jurisdictional streams will be impacted by the proposed I-69 Section 6 Design Contract 1 Permit Limits. These 20 streams consist of 2 perennial streams, 7 intermittent streams, and 11 ephemeral streams. The total length and area of stream impacts associated with Section 6 Design

Contract 1 of the I-69 project will be 14,965 feet and 1.827 acres. Table 1 below identifies the stream impacts within the Permit Limits.

Tab Lim	Table 1. Summary of Stream Impacts within the I-69 Section 6 Design Contract 1 PermitLimits								
ID #	Stream Flow Regime	Permanent Impact Length/Area	Temporary Impact Length/Area	QHEI/HHEI Avg. Score					
S6S001	Perennial	0 ft. / 0 ac.	166 ft. / 0.19 ac.	56.1					
S6S003	Ephemeral	788 ft. / 0.09 ac.	0 ft. / 0 ac.	38.5					
S6S004	Ephemeral	1,051 ft. / 0.07 ac.	0 ft. / 0 ac.	14.5					
S6S008	Perennial	2,262 ft. / 0.59 ac.	377 ft. / 0.139 ac.	37.8					
S6S009	Ephemeral	394 ft. / 0.042 ac.	0 ft. / 0 ac.	21.0					
S6S010	Ephemeral	1,524 ft. / 0.105 ac.	0 ft. / 0 ac.	17.0					
S6S011	Intermittent	304 ft. / 0.035 ac.	285 ft. / 0.034 ac.	50.3					
S6S013	Intermittent	298 ft. / 0.067 ac.	32 ft. / 0.007 ac.	29.8					
S6S014	Intermittent	781 ft. / 0.16 ac.	0 ft. / 0 ac.	69.0					
S6S015	Ephemeral	3,893 ft. / 0.289 ac.	234 ft. / 0.022 ac.	31.8					
S6S016	Ephemeral	148 ft. / 0.01 ac.	0 ft. / 0 ac.	16.0					
S6S019	Ephemeral	452 ft. / 0.052 ac.	0 ft. / 0 ac.	50.0					
S6S020	Ephemeral	463 ft. / 0.045 ac.	0 ft. / 0 ac.	35.0					
S6S021	Ephemeral	85 ft. / 0.008 ac.	0 ft. / 0 ac.	62.0					
S6S027	Ephemeral	728 ft. / 0.033 ac.	0 ft. / 0 ac.	25.7					
S6S028	Intermittent	763 ft. / 0.15 ac.	0 ft. / 0 ac.	33.0					
S6S030	Intermittent	360 ft. / 0.015 ac.	112 ft. / 0.005 ac.	14.5					
S6S035	Intermittent	84 ft. / 0.006 ac.	54 ft. / 0.004 ac.	24.0					
S6S114	Intermittent	487 ft. / 0.052 ac.	144 ft. / 0.015 ac.	31.0					
S6S115	Ephemeral	100 ft. / 0.008 ac.	42 ft. / 0.005 ac.	31.0					
Totals		14,965 ft. / 1.827 ac.	1,446 ft. / 0.421 ac.						

Stream Impacts

Stream Impact S6S001

Approximately 166 feet (0.19 ac) of Indian Creek will be temporarily impacted by the removal of the piers for the existing bridges that carry I-69 over Indian Creek. No permanent impacts are anticipated at this location. The OHWM of Indian Creek averages 50 feet wide by 7.5 feet deep. The current structures are 3 span steel beam bridges that are 228 feet long by 43 feet wide by 18.76 feet high each. The proposed new bridge structures will be continuous composite prestressed concrete 3 span structure that are 319 feet long by 46.3 feet wide by 17.17 feet above the OHWM. The three spans will be 97 feet, 125 feet, and 97 feet, respectively. The new bridge structure will completely span the OHWM and will result in an additional 5 feet of encapsulations.

A temporary cofferdam will be required for approximately 180 days for removal of the existing piers. For reference to the temporary construction measures see the erosion control plan sheets included in the bridge plans. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary dewatering cofferdams are 166 feet in length for a total area of 0.19 acre and total volume 2,350 cubic yards of Class I or revetment riprap. Post construction, sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix.

There are no permanent impacts below the OHWM in this location. Therefore, no mitigation is being offered for these temporary impacts.

Stream Impact S6S003

Approximately 788 feet (0.090 acre) of the roadside channel UNT 2 to Indian Creek will be relocated into a new captured roadside channel. The OHWM of the UNT 2 to Indian Creek ranges from 2.7 to 4.9 feet wide by 0.4 to 0.8 feet deep. The proposed relocated captured roadside channel will consist of 778 feet (0.08 acre) of open natural channel and 16 feet (0.002 acre) of open channel lined with revetment riprap for scour protection for a total channel length of 794 feet. The relocated stream will receive discharge from two cross structures. The relocation of this captured roadside channel will result in a gain of 6 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. Tree seedlings will be planted at the back of slope of the channel between the channel and the right-of-way fence. This stream is being considered restored on-site and 394 feet of mitigation is being offered for the impacts to this stream channel as only the eastern side of the channel will be planted with tree seedlings.

Stream Impact S6S004

Approximately 1,051 feet (0.070 acre) of the roadside channel UNT 3 to Indian Creek will be relocated into a proposed new captured roadside channel. The OHWM of the UNT 3 to Indian Creek averages 2.0 to 4.3 feet wide by 0.1 to 0.6 feet deep. The new proposed relocated channel will consist of 1,495 feet (0.069 acre) of open natural bottom channel. The stream relocation will result in the gain of 444 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.

Stream Impact S6S008

S6S008b & S6S008c

Approximately 189 feet (0.049 acre) of Sartor Ditch will be temporarily impacted by the removal of the existing structure and construction of the new structure that carries Southview Drive over Sartor Ditch. Note that 100 feet of these temporary impacts would occur along the relocated channel if

construction sequencing is such that the relocated channel is constructed first. No permanent impacts are anticipated for the construction of the proposed structure. The new bridge will span the OHWM and no permanent fill will be placed within the OHWM limits. The OHWM in this stretch of the UNT 3 to Sartor Ditch averages 4.6 feet wide by 0.1 to 0.6 feet deep. The existing crossing of Mahalasville Road over Sartor Ditch consists of a 15-foot span by 6.3-foot rise corrugated metal box culvert at Mahalasville Road which is 30 feet in length. This crossing is located at the downstream terminus of the Sartor Ditch relocation. Also as a part of the project, this road will be renamed to Southview Drive. The proposed crossing of Southview Drive over Sartor Ditch consists of a 36-foot wide by 14.08-foot-high three-sided concrete structure which is 47 feet in length. This structure will span the OHWM. The three-sided structure will be skewed such that the walls of the three-sided concrete structure are parallel with realigned Sartor Ditch. The total area of encapsulation 0.012 acre.

A temporary pump around and cofferdam will be required for approximately 180 days for removal of the existing piers. For reference to the temporary construction measures see the erosion control plan sheets included in the bridge plans. A temporary

S6S008j, S6S008l, S6S008m, & S6S008n

Approximately 188 feet (0.090 acre) of Sartor Ditch will be temporarily impacted by the removal of the existing 20 foot by 5-foot concrete box culvert that carries South Street over Sartor Ditch and construction of the new bridge. No permanent impacts are anticipated for the construction of the proposed structure. The new structure will span the OHWM and no permanent fill will be placed within the OHWM limits. The OHWM of Sartor Ditch in this area averages 21 feet wide by 1.2 feet deep. The existing crossing of South Street over Sartor Ditch consists of a single 20-foot span by 4.9-foot rise three-sided concrete arch which is 17 feet long. The proposed structure is a three-span bridge over Sartor Ditch which has a total length of 120-feet and is 44.9 feet wide. The three spans will be 36 feet, 48 feet, and 36 feet, respectively. There will be no change in bridge skew. The existing structure currently is open only to pedestrian traffic. Proposed Grand Valley Boulevard will be an overpass over I-69 and will tie into South Street. Therefore, the South Street crossing will be extended along the base of the retaining wall running north from South Street to York Street within the floodway of Sartor Ditch. This riprap will protect the retaining wall from floodway flows and will not be placed below the OHWM of Sartor Ditch.

A temporary pump around and cofferdam will be required for removal of the structure and installation of the new structure. For reference to the temporary construction measures see the erosion control plan sheets included in the bridge plans. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary dewatering cofferdams are 188 feet in length for a total area of 0.090 acre and total volume 200 cubic yards of Class I or revetment riprap. Post construction, sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix.

There are no permanent impacts below the OHWM in this location. Therefore, no mitigation is being offered for these temporary impacts.

S6S008d to S6S008h

Sartor Ditch from the outlet of the existing pipe carrying the Industrial Drive/entrance to the mobile home park south to the culvert carrying old Ohio Street/ new Southview Drive will be relocated. The OHWM of Sartor Ditch ranges from 10.9 to 21 feet wide by 1.2 to 1.6 feet deep. The existing

channel is 2,262 linear feet (0.590 acre) and is crossed three times. These crossings include SR 37 over Sartor with two 84-inch CMPs which are 255 and 275 feet long respectively, Industrial Drive over Sartor in a 12 foot by 8 foot by 58-foot-long elliptical CMP, and Ohio Street over Sartor Ditch in a 20 foot by 5 foot by 64-foot-long concrete box culvert.

The proposed channel will consist of 2,318 feet (0.600 acre) of natural bottom channel and will be crossed three times. The proposed cross section of the relocated channel will be a 10-foot-wide channel with 2:1 sideslopes and a small floodway bench where possible. Portions of the old channel will be filled and portions may be used for stormwater detention or to continue stormwater drainage. The increase in stream length is 56 linear feet. The proposed structures at Ohio Street and Mahalasville Drive/Southview Drive are both 36-foot wide by 12-foot high three-sided concrete structures. The proposed crossing of SR 37/I-69 over Sartor Ditch consist of two single span composite prestressed concrete bridges that measure 88-foot long. The southbound bridge is 72-feet wide and the northbound bridge is 57-feet wide. As both Ohio Street and SR 37/I-69 are crossings of the relocated channel and those impacts are not included separately. Impacts associated with the replacement crossing at Mahalasville Road/Southview Drive are included under the crossing impacts.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. It would be the responsibility of the contractor to acquire an amendment to the permit for this temporary construction. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. This stream is being restored on-site and no mitigation is being offered for the impact to this stream.

Stream Impact S6S009

Approximately 394 feet (0.042 acre) of the roadside channel UNT 1 to Sartor Ditch will be relocated. The OHWM of the UNT 1 to Sartor Ditch averages 4.6 wide by 0.1 to 0.6 feet deep. Currently, 45 feet (0.006 acres) of the stream are encapsulated. The relocated channel will be 220 feet (0.002 acre) in length including 19 linear feet (0.002 acre) of revetment riprap, and 201 (0.021 acre) of open natural channel. The relocation of UNT 1 to Sartor Ditch will result in the loss of 174 feet of channel. The channel will be moved from the west side of the existing Mahalasville Road/Southview Drive. The new channel will originate from the outlet of a new encapsulated storm sewer system.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. A total of 201 feet of impacts to this stream are

being considered restored on-site and 193 feet of mitigation is being offered for the loss of stream length and riprap scour protection area.

Stream Impact S6S010

Approximately 1,524 feet (0.105 acre) of the UNT 2 to Sartor Ditch will be relocated into a proposed new relocated channel. Of this channel length 1,444 is open roadside channel and 80 feet is existing encapsulation. The OHWM of the UNT 2 to Sartor Ditch ranges from 2.7 to 3.1 feet wide by 0.3 to 0.9 feet deep. The proposed new relocated channel will consist of 914 feet (0.063 acre) of open natural bottom channel which is broken into two segments. One segment is 390 feet in length and is located north of the relocated Sartor Ditch and one segment is 524 linear feet and is south of the Sartor Ditch. The relocation of this channel will result in the loss of 610 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. A total of 914 feet of the impacts to this stream area are being considered restored on-site and 540 feet of mitigation is being offered for the loss in stream length.

Stream Impact S6S011

S6S0011a, S6S011c, & S6S011d

The OHWM of the UNT 3 to Sartor Ditch ranges from 5.0 to 5.3 feet wide by 0.7 to 0.8 feet deep. Impacts to the UNT 3 to Sartor Ditch include replacing the existing 217 feet long by 60-inch-wide by 40-inch-high CMP that carries the SR 37 over the UNT 3 to Sartor Ditch with a new 210 feet long 68-inch-wide by 43-inch-high CMP structure (27 cubic yards) (Structure P134). In addition to the impact for the placement of the new CMP, approximately 38 feet (0.004 acre) will be impacted for the placement of revetment riprap for scour protection. The permanent impacts to the UNT 3 to Sartor Ditch include 210 feet (0.026 acre) of previously encapsulated stream channel and 38 feet (0.002 acre) of open captured roadside drainage channel for a total impact of 248 feet.

Approximately 424 feet (0.049 acre) of the UNT 3 to Sartor Ditch is located within the existing rightof-way and may be impacted by the use of a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 31 feet of mitigation is being offered for impacts to this stream due to the increase in permanent impacts from 217 feet to 248 feet with the installation of the new structure and riprap scour protection.

S6S011g

The OHWM of the UNT 3 to Sartor Ditch averages 5.3 feet wide by 0.2 feet deep. Impacts to the UNT 3 to Sartor Ditch include installation of a new culvert for Artesian Avenue. The new culvert will be 108 feet long 30 inch reinforced concrete pipe (4 cubic yards) (Structure P504a). The permanent impacts to the UNT 3 to Sartor Ditch include 20 feet (0.002 acre) of revetment riprap and 108 feet (0.012 acre) of stream encapsulation for a total impact of 128 feet.

Note, this structure will carry UNT 3 to Sartor Ditch. At this location, the main volume of flow in this stream is from the roadside ditch and Wetland S6W137a (Wetland Impacts #10) which is downstream of this culvert outlet. There is minimal flow upstream of Wetland S6W137a. This culvert was sized to adequately convey the stormwater flows but is smaller than the average channel width. Approximately 165 feet (0.02 acre) of the UNT 3 to Sartor Ditch is located within the existing right-of-way for Artesian Avenue and may be impacted by the use of a temporary pump around. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 128 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection.

Stream Impact S6S013

S6S013a

The OHWM of the UNT 5 to Indian Creek ranges from 8.5 to 9.3 feet wide by 1.0 to 1.4 feet deep. The new culvert under the southern end of Artesian Way will be an 85 feet long by 20 feet wide by 5 feet high reinforced box culvert (41 cubic yards) (Structure P505). The proposed UNT 5 to Indian Creek channel will consist of 85 feet (0.02 acre) of encapsulation and 64 feet (0.014 acre) of open channel lined with revetment riprap for scour protection.

Approximately 165 feet (0.04 acre) of the UNT 5 to Indian Creek is located within the proposed rightof-way for Artesian Avenue and may be impacted by the use of a temporary pump. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 149 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection.

S6S013b

The OHWM of the UNT 5 to Indian Creek ranges from 8.5 to 9.3 feet wide by 1.0 to 1.4 feet deep. The new culvert under the southern end of Artesian Way will be an 82 feet long by 20 feet wide by 5 feet high reinforced box culvert (26 cubic yards) (Structure P504). The proposed UNT 5 to Indian Creek channel will consist 82 feet (0.020 acre) of encapsulation and 67 feet (0.013 acre) of open channel lined with revetment riprap for scour protection.

Approximately 165 feet (0.03 acre) of the UNT 5 to Indian Creek is located within the proposed rightof-way for Artesian Avenue and may be impacted by the use of a temporary pump around. If

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necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 149 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection.

Stream Impact S6S014

Approximately 781 feet (0.160 acre) of the UNT 5 to Sartor Ditch will be relocated. The OHWM of the UNT 5 to Sartor Ditch averages ranges from 7.3 to 10.3 feet wide by 1.2 to 1.3 feet deep. The proposed new relocated UNT 5 to Sartor Ditch channel will be 1,027 feet (0.200 acre) in length and consist of 776 feet (0.24 acre) of open natural bottom channel, 207 feet (0.08 acre) of encapsulation, and 44 feet (0.010 acre) of open channel lined with class 1 riprap for scour protection. Structure P137 will replace the existing 225 feet long by 72-inch diameter culvert that carries SR 37 over the UNT 5 to Sartor Ditch with a new RCP structure (P137) that will be 207 feet long by 9 feet wide by 4 feet high. The stream relocation will result in a gain of 246 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. A total of 300 feet of mitigation is being offered for the impacts to the portion of this stream that is currently a natural channel with tree cover and remaining 481 feet are being considered restored on-site within the proposed relocated channel.

Stream Impact S6S015

S6S015m, S6S015n, & S6S015o

The OHWM of the UNT 6 to Sartor Ditch averages 3.0 to 5.0 feet wide by 0.5 to 0.9 feet deep. The existing 67 feet long by 42-inch diameter RCP structure that carries SR 252 over the UNT 6 to Sartor Ditch will be replaced with a 118 feet long by 60-inch-wide by 48 inches high RCB (17 cubic yards) (Structure P516). Permanent impacts to UNT 6 to Sartor Ditch will include 46 feet of revetment riprap (0.005 acre) and 118 feet (0.014 acre) of encapsulation for a total length of 164 feet.

Approximately 275 feet (0.03 acre) of the UNT 6 to Sartor Ditch is located with the existing right-ofway and may be impacted by the use of a temporary pump around. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix. A total of 97 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection. Mitigation is not being offered for the 67 feet of existing encapsulation.

S6S015i & S6S015j

The OHWM of the UNT 6 to Sartor Ditch ranges from 3.0 to 5.0 feet wide by 0.5 to 0.9 feet deep. Impacts to the UNT 6 to Sartor Ditch include replacing the existing 39-foot-long by 96-inch diameter CMP that carries Cramertown Loop road over the UNT 6 to Sartor Ditch with a 68 foot long by 10 feet wide by 4 feet high RCB structure (10 cubic yards) (Structure P515). The permanent impacts to UNT 6 to Sartor Ditch will include 23 feet (0.003 acre) of revetment riprap and 68 feet (0.007 acre) encapsulation for a total length of 91 feet.

Approximately 264 feet (0.030 acre) of UNT 6 to Sartor is located within the right-of-way for Cramertown Loop Road and may be impacted by the use of a temporary pump around. Of these impacts, 91 linear feet are accounted for under Stream Impact 9 associated with the crossing of Cramertown Loop and 173 linear feet are associated with Stream Impact 22 and the relocation of the UNT 6 to Sartor Ditch within the proposed right-of-way. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 102 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection. Mitigation is not being offered for the 39 feet of existing encapsulation.

S6S015i

Approximately 12 feet (0.002 acre) of the UNT 6 to Sartor Ditch will be lined with revetment riprap at the outlet of structure P154 for scour protection. Note that UNT 6 to Sartor Dich begins at the outlet of this structure. The OHWM of the UNT 6 to Sartor Ditch in this location is 5.3 feet wide and 0.4 feet deep.

The construction staging of this contract will be sequenced such that the channel stabilization is constructed prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the scour protection, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

A total of 12 feet of mitigation is being offered for the impacts to this stream.3

S6S015a to S6S015h

Approximately 3,402 feet (0.234 acre) of the UNT 6 to Sartor Ditch will be relocated. The OHWM of the UNT 6 to Sartor Ditch ranges from 3.0 to 6.0 feet wide by 0.5 to 0.9 feet deep. The proposed new relocated UNT 6 to Sartor Ditch channel will consist of 2,959 feet (0.204 acre) of open natural bottom channel, 500 feet (0.034 acre) of encapsulation, and 68 feet (0.005 acre) of open channel lined with revetment riprap for scour protection. The existing 236 feet long by 84-inch diameter CMP structure that carries SR 37 over the UNT 6 to Sartor Ditch will be replaced with 500 feet long by 90 in diameter RCP (Structure P144). The relocation of the UNT 6 to Sartor Ditch will result in the gain

of 125 feet of stream. In addition, the new bridge structure (P506) at Grand Valley will cross the relocated UNT 6 to Sartor Ditch.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. A total of 2,959 feet of this stream are being considered restored on-site and 443 feet of mitigation is being offered for the loss of natural channel length, increase in encapsulation and placement of riprap scour protection.

<u>S6S015k</u>

Approximately 174 feet (0.021 acre) of the roadside channel will be relocated into a proposed new captured roadside channel. The OHWM of the UNT 6 to Sartor Ditch averages 5.2 feet wide by 0.5 feet deep. The new proposed relocated channel will consist of 143 feet (0.020 acre) of open natural bottom channel upstream of the proposed culvert carrying Cramertown Loop over UNT 6 to Sartor Ditch. The stream relocation will result in a loss of 30 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. A total of 143 feet of this stream are being considered restored on-site and 26 feet of mitigation is being offered for the loss of natural channel length.

Stream Impact S6S16

Approximately 148 feet (0.01 acre) of the captured roadside channel will be relocated into a proposed new captured roadside channel. The OHWM of the UNT 7 to Sartor Ditch averages 3.0 feet wide by 0.5 feet deep. The new proposed relocated channel will consist of at least 148 feet (0.01 acre) of open natural bottom channel. The stream relocation will not result in any loss of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

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The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.

Stream Impact S6S019

Approximately 452 feet (0.052 acre) of the roadside channel UNT 10 to Sartor Ditch will be relocated. The OHWM of the UNT 10 to Sartor Ditch at this location is 5.0 feet wide by 0.7 feet deep. The proposed new relocated UNT 10 to Sartor Ditch includes at least 452 feet (0.052 acre) of open natural bottom channel. This relocation will not result in the loss of any stream length.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.

Stream Impact S6S020

Approximately 463 feet (0.045 acre) of the roadside channel UNT 11 to Sartor Ditch will be relocated. The OHWM for this location of the UNT 11 to Sartor Ditch is 4.2 feet wide by 0.3 feet deep. The new relocated UNT 11 to Sartor Ditch channel includes a minimum of 463 feet (0.045 acre) of open natural bottom channel. This relocation will not result in the loss of any stream length.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.

Stream Impact S6S021

Approximately 85 feet (0.008 acre) of Sartor Ditch will be relocated downstream of a residential driveway culvert. The existing culvert will be relocated, resulting in the relocation of the existing roadside channel. The OHWM for this location of the Sartor Ditch is 4.2 feet wide by 0.8 feet deep. The new relocated Sartor Ditch channel includes 85 feet (0.008) of open natural bottom channel and 8 feet (0.001 acre) of revetment riprap for scour protection. The existing 29 feet long by 18-inch-wide diameter CMP structure that carries a residential driveway over Sartor Ditch will be replaced with 29 feet long by 18-inch reinforced concrete pipe (RCP) (Structure P560). This relocation will not result in the loss of any stream length.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix. This stream is being considered restored on-site and no mitigation is being offered for the impacts to this stream.

Stream Impact S6S027

Approximately 728 feet (0.033 acre) of the UNT 1 to West Fork Clear Creek will be relocated. The OHWM of the UNT 1 to West Fork Clear Creek ranges from 2.0 to 5.5 feet wide by 0.1 to 0.9 feet deep. Impacts to the UNT 1 to West Fork Clear Creek include replacing the existing 535 feet long by 36-inch diameter steel pipe structure carrying SR 37 over the UNT 1 to West Fork of Clear Creek with a 411 feet long 36-inch diameter pipe (Structure P160a). The new relocated UNT 1 to West Fork Clear Creek channel will include encapsulation of 411 feet (0.019 acre) of stream and relocation and revetment riprap armament of 380 feet (0.017 acre) of stream with 82 feet (0.004 acre) of natural channel to remain. The relocation results in the gain of 63 linear feet of stream.

Approximately 810 feet (0.050 acre) of UNT 1 to West Fork Clear Creek is located within the existing right-of-way for and may be impacted by the use of a temporary pump around. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included

The old channel will be filled. Streambanks will be stabilized with riprap due to the steepness of the roadway sideslopes.

No mitigation is being offered for the 535 feet of impacts to the existing encapsulation portion of this stream. A total of 527 feet of mitigation is being offered for the remainder of impacts.

Stream Impact S6S028

Approximately 763 feet (0.15 acre) of the UNT 2 to West Fork Clear Creek is located within the existing right-of-way of mainline of I-69 and the new Twin Branch Road. The OHWM of the UNT 2 to West Fork Clear Creek ranges from 4.0 to 9.3 feet wide by 0.2 to 0.7 feet deep. Impacts to the UNT 2 to West Fork Clear Creek include replacing the existing 318 feet long by 36-inch diameter steel pipe structure carrying SR 37 over the UNT 2 to West Fork Clear Creek with a 528 feet long 36-inch diameter pipe (77 cubic yards) (Structure P160b). The new relocated UNT 2 to West Fork Clear Creek channel will include 528 feet (0.11 acre) of encapsulation and relocation, 94 feet (0.02 acre) of revetment riprap for scour protection, and 79 feet (0.02 acre) of natural channel to remain. The relocation results in the loss of 63 linear feet of stream.

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The construction staging of this contract will be sequenced such that the channel relocation is constructed and stabilized with riprap prior to release of into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be stabilized with riprap due to the steepness of the roadway sideslopes.

No mitigation is being offered for the 318 feet of impacts to the existing encapsulation portion of this stream. A total of 79 feet of stream is being considered restored on-site and a total of 288 feet of mitigation is being offered for the remainder of impacts.

Stream Impact S6S030

The OHWM of the UNT 4 to West Fork Clear Creek ranges from 1.9 to 2.6 feet wide by 0.4 to 0.5 feet deep. The impacts to the UNT 4 to West Fork Clear Creek include replacing the existing structure carrying SR 37 over the UNT 4 to West Fork Clear Creek and the structure that carries Twin Branch Road over the UNT 4 to West Fork Clear Creek. The existing structure on SR 37 is a 248 feet long 30-inch CMP and the structure on Twin Branch Road is a 125 feet long 24-inch CMP. Both existing structures will be replaced with a single new structure (P512) that will be a 330 feet long 36-inch RCP. Impacts to the UNT 4 to West Fork Clear Creek include 330 feet (0.014 acre) of encapsulation (9 cubic yards), 30 feet (0.001 acre) of revetment riprap placed in the channel for scour protection, 112 feet (0.005 acre) of natural channel will remain following the installation of the new structure.

Approximately 472 feet (0.02) of the UNT 4 to West Fork Clear Creek is located within the right-ofway for the mainline of I-69 and the Twin Branch Road and may be impacted by the use of a temporary pump around. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

No mitigation is being offered for this stream impact since the proposed new structure and riprap length (360 feet) of new encapsulation and riprap being proposed is less than the length of the existing encapsulation at 373 feet.

Stream Impact S6S035

The OHWM for this location of the UNT 8 to West Fork Clear Creek is 3.3 feet wide by 0.3 feet deep. The existing 56 foot-long by 24-inch diameter RCP carrying Twin Branch Road over UNT 8 to West Fork Clear Creek will be replaced with a 54-foot-long by 36-inch diameter RCP (Structure P511). Impacts associated with the installation of the new structure include 30 feet (0.002 acre) of revetment riprap lined channel, 54 feet (0.004) of encapsulation, 25 feet (0.002 acre) of open natural channel will remain following the installation of the new structure.

Approximately 138 feet (0.010 acre) of the UNT 8 to West Fork Clear Creek is located within the existing right-of-way for Twin Branch and may be impacted by the use of a temporary pump around. If necessary, the temporary pump would be in place for approximately 120 days. A temporary

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crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 28 feet of mitigation is being offered for all impacts not within the existing encapsulation of this stream and no mitigation is being offered for the 54 feet of existing encapsulation.

Stream Impact S6S0114

The OHWM of the UNT 3 to West Fork Clear Creek averages 4.6 feet wide and ranges from 0.5 to 0.7 feet deep. The impacts to the UNT 3 to West Fork Clear Creek include replacing the existing structure carrying SR 37 over the UNT 3 to West Fork Clear Creek and the existing structure that carries Twin Branch Road over the UNT 3 to West Fork Clear Creek. The existing structure on SR 37 is a 354-foot-long 36-inch steel pipe and the existing structure on Twin Branch Road is a 58 feet long 24-inch concrete pipe. Both existing structures will be replaced with a single new structure (P510) that will be a 472-foot-long by 36-inch diameter RCP (56 cubic yards). Impacts to the UNT 3 to West Fork Clear Creek include 472 feet (0.050 acre) of encapsulation, 15 feet (0.002 acre) of revetment riprap for scour protection, 152 feet (0.16 acre) of natural channel will remain following the installation of the new structure.

Approximately 631 feet (0.067 acre) of the UNT 3 to West Fork Clear Creek is located within the right of way for mainline of I-69 and the Twin Branch Road and may be impacted by the use of a temporary pump around. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 75 feet of mitigation is being offered for this stream impact due to the new encapsulation. Mitigation is not being offered for the 354 and 58 feet of existing encapsulation.

Stream Impact S6S115

The OHWM of the UNT 19 to West Fork Clear Creek is 4.9 feet wide by 0.6 feet deep. The impacts to the UNT 19 to West Fork Clear Creek include replacing the existing 60 feet long by 24-inch diameter RCP carrying Twin Branch Road over the UNT 19 to West Fork Clear Creek with a new 70 feet long by 36-inch RCP (Structure P514) (8 cubic yards). Impacts to the UNT 19 to West Fork Clear Creek include 60 feet (0.005 acre) of existing encapsulation, 30 feet (0.003 acre) of revetment riprap placed in the channel for scour protection, 42 feet (0.005 acre) of open channel will remain following the installation of the new structure.

Approximately 142 feet (0.02 acre) of the UNT 19 to West Fork Clear Creek is located within the right-of-way for Twin Branch Road and may be impacted by the use of a temporary pump around. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix.

A total of 40 feet of mitigation is being offered for all impacts not within the existing encapsulation of this stream and no mitigation is being offered for the 60 feet of existing encapsulation.

VII. Regulatory Involvement

A Waters of the U.S. Jurisdictional Determination Report was submitted to the USACE in September 2018

The Corps of Engineers exercises regulatory authority over activities involving the discharge of fill or dredged material into "Waters of the United States" and is responsible for enforcing compliance with the Environmental Protection Agency 404(b)(1) guidelines as a prerequisite to issuance of a Section 404 permit. Any and all parties proposing construction activities involving deposition of fill or dredged material, disruption or destruction through land clearing, and/or alteration of hydrology are required by law to submit for and obtain a permit through the Corps of Engineers before such activities can proceed. In general, Section 404 permits issued by the Louisville District Corps of Engineers office fall into three categories for Indiana: Individual permits, nationwide permits, and the regional general permit.

Regulatory authority for Section 401 of the Clean Water Act is the responsibility of the Indiana Department of Environmental Management (IDEM). IDEM is charged with maintaining the chemical, physical and biological integrity of Indiana waters through its Water Quality Certification (WQC) program. Section 401, in concert with the Corps Section 404 program, insures that project activities impacting "Waters of the United States" and/or "Waters of the State", including wetlands, are conducted in compliance with the states water quality policies.

Section 404 individual permits (IP) are required for projects where the scope of work would result in significant and/or unique environmental impacts to "Waters of the United States" not covered in any of the pre-authorized nationwide permits. Briefly, the individual permit process involves: (1) submitting the appropriate application, (2) issuance of a public notice, (3) a 30 day comment period, (4) a review by federal, state and local agencies, as well as, special interest groups and the public, (5) a review of comments received, (6) possible request for additional information (7) a possible public hearing, and (8) the decision to issue or deny the permit. This process can take up to six or more months.

Section 404 nationwide permits have been established to streamline the permitting process by preauthorizing a variety of common activity, which by their very nature result in only minor impacts to "Waters of the United States". Nationwide permits are advantageous because unlike the individual permit they forgo the need to issue a public notice, do not require a 30 day comment period, and are not subject to a public hearing. Projects meeting the qualifications for a specific nationwide permit must however still comply with the Section 404 general and specific conditions required, including notification of the District Engineer when applicable. Issuance of several of the nationwide permits also requires Section 401 Water Quality Certification (WQC) through the IDEM.

The Section 404 regional general permit (RGP) for Indiana was re-issued on December 12, 2014. It authorizes activities related to construction of new facilities or structures, which have minimal individual and cumulative impacts. This permit is applicable to activities involving (1) loss of waters of the US in special aquatic sites, including wetlands, is limited to 1.0 acre or less, (2) loss of waters of the US is limited to 1,500 linear feet of stream channel, not to exceed 1.0 acre, (3) dredging in navigable waters is limited to 10,000 cubic yards, and (4) structures and fill for docking and mooring are limited to similar permitted structures and fills in the vicinity. Under this regional general permit,

discharges impacting less than 0.10 acre do not require USACE notification, but still necessitate that an application be submitted to the IDEM for WQC and the IDNR Division of Water for a Construction in a Floodway Permit, if applicable. Typical response time for the IDEM public notice period (21 days) and review process is 120 days from date of application. Upon receiving the IDEM's Section 401 approval, the Corps begins its formal review of the project. Response from the Corps is typically within 45 days.

VIII. Summary

The stream field reviews in 2015, 2017, and 2018 for the proposed I-69 Section 6 Design Contract 1 project in Morgan County, Indiana resulted in the identification of 20 jurisdictional streams that will be impacted within the Permit Limits. Approximately 14,965 linear feet (1.827 acres) of streams will be permanently impacted and 1,446 linear feet (0.421 acre) of streams will be temporarily impacted by the construction of I-69 Section 6 Design Contract 1. Normal circumstances were considered to exist at the stream impact sites. Coordination with the USACE and the IDEM on this project is ongoing. Mitigation for the permanent impacts to the streams will be completed by onsite stream restoration or offsite compensatory mitigation at a 1:1 ratio.















Stream S6S001



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	Indian Creek	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	92.987 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	18
IDEM 303(d) Listed:	No	Quarter:	NW
USACE Jurisdiction	Yes	Latitude:	39.394065
IDEM Jurisdiction:	Yes	Longitude:	-86.460799

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S001a	Perennial	Natural	70.00	3.63	QHEI = 62.25	0	0.00	0.00
S6S001b	Perennial	Natural Bridged	50.00	7.50	QHEI = 38	166	0.19	0.00
S6S001c	Perennial	Natural	60.67	3.63	QHEI = 68	0	0.00	0.00
Total	-			•	-	166	0.19	0.00

* Includes both permanent and temporary impacts

Approximately 166 feet (0.19 ac) of Indian Creek will be temporarily impacted by the removal of the piers for the existing bridges that carry I-69 over Indian Creek. No permanent impacts are anticipated at this location. The OHWM of Indian Creek averages 50 feet wide by 7.5 feet deep. The current structures are 3 span steel beam bridges that are 228 feet long by 43 feet wide by 18.76 feet high each. The proposed new bridge structures will be continuous composite prestressed concrete 3 span structure that are 319 feet long by 46.3 feet wide by 17.17 feet above the OHWM. The three spans will be 97 feet, 125 feet, and 97 feet, respectively. The new bridge structure will completely span the OHWM and will result in an additional 5 feet of encapsulations.

A temporary cofferdam will be required for approximately 180 days for removal of the existing piers. For reference to the temporary construction measures see the erosion control plan sheets included in the bridge plans. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary dewatering cofferdams are 166 feet in length for a total area of 0.19 acre and total volume 2,350 cubic yards of Class I or revetment riprap. Post construction, sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

There are no permanent impacts below the OHWM in this location. Therefore, no mitigation is being offered for these temporary impacts.

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)										
	Sample #		bioSample #		Stream Name		Location			
-	S6S001a		N/A				downstream of S	SR37 bridg	e	
1	ry	10/28/2015	Morgan	N/A	ro Sample Type	Complete	QHEI Sc	ore:	62.25	
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4] BAN River rig L R V NC V MC HE	IK EROSIO ght looking downs EROSION DNE/LITTLE [3 DDERATE [2] EAVY/SEVERE	N AND RIPARIA trea L R RIPA WIDE M MODE M MODE M MARR [1] NONE	AN ZONE Ch ARIAN WIDT >50m [4] RATE 10-50m [3 OW 5-10m [2] NARROW [1] [0]	eck ONE ir H L R V V I]	n each category for FLOOD PLAIN FOREST, SWAMP [SCRUB OR OLD FI RESIDENTIAL, PRH FENCED PASTURE OPEN PASURE, RC	EACH BANK (Or I QUALITY [3] ELD [2] (, NEW FIELD [1] [1] Indi DWCROP [0] pas	2 per bank and av L R URBAN (URBAN (MINING/(cate predominant t 100m riparian	verage) VATION TI DR INDUST CONSTRUC land use(s) Riparia Maximu	LLAGE [1] RIAL [0] CTION [0] an m 8.3	
5] <i>POC</i>	OL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Pocreation D	Potential	
MAXIM Check OI ✓ >1 m [0.7 - < 0.4 - < 0.2 - < <0.2m	UM DEPT NE (ONLY! [6] 1m [4] 0.7m [2] 0.4m [1] [0] ents	H CHAN Check ON ✓ POOL WI ○ POOL WI	NEL WIDTH IE (Or 2 and ave DTH > RIFFLE W DTH = RIFFLE W DTH < RIFFLE W	erage) /IDTH [2] /IDTH [1] /IDTH [0]	CURR Ch TORRENTIA VERY FAST FAST [1] MODERATE Ind	EENT VELOCI eck All that apply L [-1] SLO [1] INTE [1] INTE [1] EDD licate for reach - p	TY (Circle W [1] ERSTITIAL [-1] RMITTENT [-2] IES [1] pools and riffles	Primary Co Secondary Poc Curre Maximu	ontantal imment on back) pontact / Contact ol/ nt 9.0	
Indicate	e for functiona	l riffles; Best area	s must be large	enough to	support a populatio	'n				
of riffle- RIFFLE ■ BEST ■ BEST ■ BEST	obligate spec E DEPTH AREAS>10cn AREAS 5-10c AREAS 5-10c AREAS <5cm [metr	ies: RUN DE n [2] MAXIM m [1] MAXIM ic=0]	E PTH UM >50cm [2] UM<50cm [1]	Check RIFFLI STAB MOD. V UNST	One (Or 2 and ave E/RUN SUBST LE (e.g., Cobble, B STABLE (e.g, Larg ABLE (e.g., Fine Fr	rage) RATE RIF oulder) [2] e Gravel) [1] vel, Sand) [0]	☐ <u>NO RII</u> FLE/RUN EM NONE [2] ✓ LOW [1] MODERATE [0] EXTENSIVE [-1	FLE [METI BEDDEC Riffl Riffl Maximu	RIC=0] DNES	
	DIENT (5 ft/r	ni)	VFRYIOW -	1 OW [2 - 4		25 % CI				
DRAI	NAGE ARE	A (92.87 sq. mi.)	MODERATE	[6 - 10] ' HIGH [10 -	6] % RUN: [50 % RIF	FLE: 15	Gradie Maximu	nt Im 10 10.0	

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)



A-CANOPY

Comment

─ >85% - Open	Looking upstrea	m (>10m, 3 readir	ngs, <10m reading in midd	lle); Round to the ne	earest whole percent
✓ 55% -<85%		Left	Middle	Right	Total Average
30%-<55%	% open	%	%	%	%
10%-<30%					
<10% - Closed					
B-AESTHETICS			<u>C-RECR</u>	EATION	
Nuisance algae	Oil sheen		Area	Depth	
Invasive macrophytes	Trash/Litter		Pool: √ > 100ft ²	2 \checkmark > 3ft	
Excess turbidity	Nuisance o	dor			
Discoloration	Sludge depe	osits			
Foam/Scum	CSOs/SSOs	/Outfalls			
D-MAINTENANCE			E-ISSUE	S	
Public Private					IPDES
Active Historic			Industr	y 🗌 Urban	
Succession: 🗌 Young ✔	Old		Harden	ned 🗌 Dirt Gr	ime
Spray Islands Sc	oured		Contan	ninated 🗌 La	andfill
Snag: 🗌 Removed 🗌 Mo	dified		BMPs:	Construction	Sediment
Leveed: One sided	Both banks		🗌 Loggin	g 🗌 Irrigation	Cooling
Relocated Cutoffs			Erosion:	🖌 Bank 🗌 S	Surface
Bedload: 🗌 Moving	Stable		False b	oank 🗌 Manu	re 🗌 Lagoon
Armoured Slumped			Wash H	120 🗌 Tile 🗌	H2O table
Impounded Desiccate	d		Mine:	Acid Quar	ry
Flood control Draina	ge		Flow: 🗸	Natural 🗌 Sta	agnant
			Wetlan	d 🗌 Park 🗌	Issues: Golf
			Lawn	Home	
			Atmos	pheric depositio	on

Stream Drawing:





Stream S6S001a - facing downstream



Stream S6S001a - facing upstream

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)											
	Sample #		bioSample #	Strea	am Name		Location	7 1			
1000 P	S6S001b		N/A	India			under SR3	7 bridge			
1	surveyor ry	10/28/2015	County Morgan	Macro S	ample Type	Complete		Score:	38		
11 SU	BSTRATE	Check ONLY Two	predominant su	bstrate TYPE E	OXES;						
	estimate % and check every type present Check ONE (Or 2 and average)										
PREDOMIN	BEST TYF NANT	PES PRESENT TOTAL %	OT PREDOMINANT	HER TYPES PRES	ENT TOTAL%			QUALITY			
	LDR/SLABS [1			AN [4]	R	LIMESTONE TILLS [1]	[1]	HEAVY [-2] MODERATE [-1]			
	OULDERS [9]	, <u> </u>		US [3]			[0] V	NORMAL [0]	Substrate		
	RAVEL [7]					SANDSTON	E [0]		13 0		
	AND [6] EDROCK [5]					_ RIP/RAP [0] _ Lacstrine	[0]	LXTENSIVE [-2] MODERATE [-1]	10.0		
NUMBE	R OF BEST T	YPES: 🗌 4 or mo	ore [2] (Scor	e natural substr e from point-so	ates;ignore urces)	SHALE [-1] COAL_FINES	∑[-2] ⊻ [NORMAL [0]	Maximum		
Comm	ents	V 5 or les	S [0]		,		·[-] — ·		20		
2] INS	TREAM CO	VER Indicate pr	esence 0 to 3 a	nd estiamte per	cent: 0-Absen	t; 1- Very small	amounts or if I	more common o	of marginal		
quality; 2	2-Moderate an	nounts, but not of h	nighest quality o	r in small amou	nts of highest o	quality; 3- Highe	est	AMO			
that is st	able, well deve	eloped root wad in	deep/fast water	, or deep, well-	defined, functir	ioal pools.)		EXTENSIVE >	•75% [11]		
% Amou			% Amount	101 S-20CM [2]	% Amount	BUMS BACKW		MODERATE 2	5-75% [7] % [2]		
==	OVERHANGI	VG VEGETATION	[1] = R	DOTWADS [1]		UATIC MACRO	PHYTES [1]	NEARLY ABS	ENT <5% [1]		
=	ROOTMATS [1])[1] <u> </u>	JULDERS[I]	L0	GS OR WOODY	DEBRIS [1]	Cov Maximi	/er		
Comm	ents boulder	size riprap in wate	er along banks					Maxim	20 1.0		
3] CH	ANNEL MOR	RPHOLOGY Ch	eck ONE in eac	n category (Or 2	and average)						
SINUC	OSITY	DEVELOF	PMENT	CHANNEI		S	TABILITY				
	[4] ERATE [3]	GOOD [5]	INT [7]		ED [4]		HIGH [3] MODERATE	[2] Chani	nel 🖂 🗌		
	[2]						LOW [1]	Maxim	um 20 4 .0		
Comm	ents								20		
4] BA	NK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in eac	h category for	EACH BANK (0	Or 2 per bank a	and average)			
River I	ight looking downs	trea L R RIP	ARIAN WIDT		DOD PLAIN						
			RATE 10-50m [3		UB OR OLD FI	5] ELD [2]		BAN OR INDUS	TRIAL [0]		
	ODERATE [2]		OW 5-10m [2] NARROW [1]		IDENTIAL, PRK CED PASTURE	C, NEW FIELD [1	dicate predomi	IING/CONSTRU			
	EAVY/SEVERE		[0]		n pasure, ro	WCROP [0] pa	ast 100m ripari	^{an} Ripari	an a		
Comm	onto							Maxim	um 3.0		
5] PO	OL/GLIDE A	ND RIFFLE /RU	IN QUALITY								
MAXIN		H CHAN			CURR	ENT VELO	CITY	Recreation (Circle one and cor	Potential mment on back)		
Check C	NE (ONLY! [6]		IE (Or 2 and ave DTH > RIFFLE W	erage) /IDTH [2]		eck All that app L [-1]	ly .OW [1]	Primary C	Contact		
	<1m [4] <0.7m [2]	POOL WI	DTH = RIFFLE W DTH < RIFFLF W	/IDTH [1]	VERY FAST	[1] DIN	TERSTITIAL [-1] Secondar	y Contact		
0.2	<0.4m [1]				MODERATE	[1] 🗌 🗌 EC	DIES [1]		ent		
	n [U] onte				Ind	icate for reach ·	- pools and riffl	es Maxim	um 7.0 12		
Indicat	e for functiona	l riffles: Best areas	s must be large	enouah to supp	ort a populatio	n					
of riffle	-obligate spec	ies:	5	Check One	(Or 2 and ave	rage)		IO RIFFLE [MET	RIC=0]		
RIFFL	E DEPTH	RUN DE	PTH	RIFFLE/R	UN SUBSTI	RĂTE R	IFFLE/RUN	EMBEDDE	DNES		
BES	「AREAS>10cn 「AREAS 5-10c	n [2] 🔄 MAXIM m [1] 🔲 MAXIM	IUM >50cm [2] IUM<50cm [1]	STABLE (e.g., Cobble, Bo BLE (e.g, Larg	oulder) [2] e Gravel) [1]	NONE [2]	Diff			
BEST	AREAS <5cm	 ic=0]		✓ UNSTABL	E (e.g., Fine Fr	vel, Sand) [0]		TE [0] KIII /F [-1] Mavimi			
Comm	ents	.o -o]						ייין ואמאוווו			
6] GRA	DIENT (5 ft/r	ni)	VERY LOW -	LOW [2 - 4]	% POOL:	100 % C					
DRA	INAGE ARE	, A (92.87 sq. mi.)	MODERATE	[6 - 10] ' HIGH [10 - 6]	% RUN:	0 % RI		Gradie Maxim	ent um 10.0		
							·				

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)



A-CANOPY

Comment

>85% - Open	Looking upstrea	m (>10m, 3 readir	ngs, <10m reading in mid	dle); Round to the n	earest whole percent				
55% -<85%		Left	Middle	Right	Total Average				
30%-<55%	% open	%	%	%	%				
10%-<30%	•								
✓ <10% - Closed									
<u>B-AESTHETICS</u>			<u>C-RECF</u>	REATION					
Nuisance algae	Oil sheen		Area	Depth					
Invasive macrophytes	✓ Trash/Litter		Pool:	²					
Excess turbidity	Nuisance o	dor							
Discoloration	Sludge dep	osits							
Foam/Scum	CSOs/SSOs	/Outfalls							
D-MAINTENANCE			<u>E-ISSUI</u>	<u>ES</u>					
✓ Public Private			WWTP	י 🗌 CSO 🗌 ו	NPDES				
✓ Active ☐ Historic			Indust	ry 🗌 Urban					
Succession: 🗹 Young 🗌	Old		Harder	ned 🗌 Dirt G	rime				
🗌 Spray 🖌 Islands 🗌 S	coured		Contaminated Landfill						
Snag: 🗌 Removed 🗌 Mo	odified		BMPs: Construction Sediment						
Leveed: 🗌 One sided 🗌	Both banks		Loggir	ng 🗌 Irrigatio	n 🗌 Cooling				
Relocated Cutoffs			Erosion:	🗌 Bank 🔲 S	Surface				
Bedload: 🗌 Moving 🗌	Stable		False I	bank 🗌 Manu	re 🗌 Lagoon				
Armoured Slumped	1		Wash	H2O 🗌 Tile 🛛	H2O table				
🗌 Impounded 📃 Desiccat	ed		Mine:	Acid Qua	rry				
Flood control Drain	age		Flow:	Natural 🗌 St	agnant				
			Wetlar	nd Park	Issues: Golf				
			Lawn	Home					
			Atmos	pheric depositi	on				

Stream Drawing:





Stream S6S001b - facing upstream



Stream S6S001b - facing downsteam

IDEM		OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)										
	Sample #		bioSample #	Str	ream Name		L	Location				
1000	S6S001c		N/A	In	dian Creek		l	upstream o	f SR37 bridge			
1	Surveyor	Sample Date	County	Macro	Sample Typ	be 🗌 Hab	itat	QHEI	Score:	68		
41 011		To/20/2013	nrodominant su		BOVES	Comple	le					
1] 50	BSIRAIE	estimate %	6 and check eve	ry type prese	nt	Chec	k ONE	(Or 2 and	average)			
PREDOMIN PR	BEST TYP	ES PRESENT TOTAL % P R	OT 5 PREDOMINANT P R	HER TYPE Pr I	ES ESENT TOTAL % P R	ORIG	IN NE [1]		QUALITY			
B B C C C C C C C C C C C C C C C C C C	LDR/SLABS [1(OULDERS [9] OBBLE [8] RAVEL [7] AND [6] EDROCK [5]	$ \begin{array}{c} \bullet \\ \bullet $	HARDF	PAN [4] [US [3] [2] [CIAL [0]		TILLS [1] WETLAND HARDPAN SANDSTO RIP/RAP [LACSTRIN	DS [0] I [0] INE [0] 0] IE [0]		NODERATE [-1] IORMAL [0] REE [1] XTENSIVE [-2] NODERATE [-1]	Substrate		
NUMBE	R OF BEST TY	PES: 🔄 4 or mo V 3 or les	ore [2] (Scor ss [0] ^{sludg}	e from point-	strates;Ignore sources)	COAL FIN] ES [-2]		IORMAL [0] IONE [1]	Maximum 20		
Comm	ents											
2] INS quality; 2 quality in that is st % Amoun 	2-Moderate am n moderate or g able, well deve nt UNDERCUT B OVERHANGIN SHALLOWS (I ROOTMATS [ents	/ER Indicate pr ounts, but not of h preater amounts (loped root wad in ANKS [1] IG VEGETATION [N SLOW WATER]	resence 0 to 3 a highest quality o e.g., very large b deep/fast water <u>% Amount</u> <u>20 2 P(</u> 1] <u>2 1 R(</u>)[1] <u>8</u>	nd estiamte p r in small amo ooulders in de r, or deep, we OOLS>70CM [OOTWADS [1] OULDERS [1]	percent: 0-Abs pounts of highes pep or fast wat ill-defined, fund % Amount [2] (] (3 1_ 1	ent; 1- Very sm st quality; 3- Hig er, large diamet ctinoal pools.) OXBOWS, BACK AQUATIC MACR LOGS OR WOOI	all amo hest er log (WATE OPHY DY DEE	RS [1] RS [1]	nore common of AMO heck One (Or 2 EXTENSIVE > MODERATE 2 SPARSE -<25 NEARLY ABS Co Maxim	of marginal JNT and average) 475% [11] 5-75% [7] % [3] ENT <5% [1] ver 20 7.0		
31 CH	ANNEL MOR	PHOLOGY Ch	eck ONE in eac	h category (O	r 2 and averag	je)						
SINUC HIGH MOD LOW NON	DSITY [4] ERATE [3] [2] E [1] ents	DEVELOF EXCELLE GOOD [5] ✓ FAIR [3] POOR [1]	PMENT ENT [7] I	CHANN ✓ NONE [4 RECOV RECOV RECOV	ELIZATION 6] ERED [4] ERING [3] T OR NO RECO	DVERY [1]	STA ☐ HI ✓ MC ☐ LC	BILITY GH [3] DDERATE [DW [1]	2] Chan Maxim	nel um 20 14.0		
4] BA	NK EROSIOI	N AND RIPARIA	AN ZONE Ch	eck ONE in e	each category f	or EACH BANK	(Or 2	per bank a	nd average)			
River I L R V N H Commo	ight looking downstr EROSION ONE/LITTLE [3] ODERATE [2] EAVY/SEVERE ents	L R RIP A ✓ ✓ WIDE MODE NARR U VERY [1] U NONE	ARIAN WIDT >50m [4] RATE 10-50m [2 OW 5-10m [2] NARROW [1] [0]	H L R F ✓ ✓ FC 3] SC RE 0] OI	LOOD PLA Drest, Swam Crub or Old Esidential, P Sinced Pastu Pen Pasure,	IN QUALITY P [3] FIELD [2] RK, NEW FIELD RE [1] ROWCROP [0]	[1] Indica past 1	L R CON URE MIN te predomi 00m riparia	NSERVATION T BAN OR INDUS ING/CONSTRU nant land use(s an Ripari Maxim	ILLAGE [1] TRIAL [0] CTION [0] s) ian UM 10		
5] PO	OL/GLIDE A	ND RIFFLE /RU	IN QUALITY						Decreation	Detential		
MAXIN Check C ✓ >1 m 0.7 - 0.4 - 0.2 - <0.2r	IUM DEPTH NE (ONLY! <1m [4] <0.7m [2] <0.4m [1] n [0]	H CHAN Check ON POOL WI ✓ POOL WI	NEL WIDTH IE (Or 2 and ave DTH > RIFFLE W DTH = RIFFLE W DTH < RIFFLE W	erage) /IDTH [2] /IDTH [1] /IDTH [0]	CUF TORRENT VERY FAS FAST [1] MODERAT	REENT VEL(Check All that a IAL [-1] T[1] TE [1] ndicate for reac	DCIT pply SLOW INTERS INTERS EDDIES ch - poo	Y ([1] STITIAL [-1] WITTENT [-2 S [1] DIs and riffle	Circle one and cor Primary (Secondar 2] Po Curre es Maxim	contact y Contact ol/ ent 12 8.0		
Lomme Indicat	ents e for functional	riffles; Best areas	s must be large	enough to su	pport a popula	tion			0 DIESI 5 7			
RIFFL ✓ BEST BEST Comm	E DEPTH AREAS>10cm AREAS 5-10cr AREAS <5cm [metri ents	RUN DE [2] ✓ MAXIM n [1] MAXIM c=0]	E PTH IUM >50cm [2] IUM<50cm [1]	Check Or RIFFLE / STABLE MOD. S UNSTAI	ne (Or 2 and a RUN SUBS E (e.g., Cobble, TABLE (e.g, La BLE (e.g., Fine	verage) S TRATE Boulder) [2] Irge Gravel) [1] Frvel, Sand) [0]	RIFF	LE/RUN NONE [2] LOW [1] MODERAT EXTENSIV	C RIFFLE [MET EMBEDDE FE [0] Riff FE [0] R FE [-1] Maxim	RIC=0] DNES [le/ un 8 5.0		
61 GRA	DIENT (5 ft/m	ni)	VFRYIOW.	I OW [2 - 4]		· 20 •/	GU)E . 5				
DRA	INAGE AREA	, 1 (92.87 sq. mi.)	MODERATE	[6 - 10] (HIGH [10 - 6]	3 F OOL	: 45 %	RIFFI	LE: 30	Gradie Maxim	ent um 10		

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)



Stream Drawing:




Stream S6S001c - facing upstream



Stream S6S001c - facing downsteam

Stream S6S003



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 2 Indian Creek	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.005 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	8
IDEM 303(d) Listed:	No	Quarter:	SW
USACE Jurisdiction	Yes	Latitude:	39.400808
IDEM Jurisdiction:	Yes	Longitude:	-86.446336

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S003a	Ephemeral	Culvert	4.90	0.83	N/A	37	<0.01	0.00
S6S003b	Ephemeral	Roadside Ditch	4.90	0.83	HHEI = 46	570	0.06	0.48
S6S003c	Ephemeral	Roadside Ditch	2.67	0.40	HHEI = 31	181	0.01	0.00
Total						788	0.08	0.48

* Includes both permanent and temporary impacts

Approximately 788 feet (0.090 acre) of the roadside channel UNT 2 to Indian Creek will be relocated into a new captured roadside channel. The OHWM of the UNT 2 to Indian Creek ranges from 2.7 to 4.9 feet wide by 0.4 to 0.8 feet deep. The proposed relocated captured roadside channel will consist of 778 feet (0.09 acre) of open natural channel and 16 feet (0.002 acre) of open channel lined with revetment riprap for scour protection for a total channel length of 794 feet. The relocated stream will receive discharge from two cross structures. The relocation of this captured roadside channel will result in a gain of 6 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. Tree seedlings will be planted at the back of slope of the channel between the channel and the right-of-way fence. This stream is being considered restored on-site and 394 feet of mitigation is being offered for the impacts to this stream channel as only the eastern side of the channel will be planted with tree seedlings.

Primary Headwater Habitat Evaluation Form

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

46

SITE NAME/LOCATION UNT 2 Indian Creek		
SITE NUMBER S6S003b	RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.005	
LENGTH OF STEAM REACH (ft)	39.401002 LONG86.448066 RIVER CODE N/A RIVER MILE N/A	
DATE 10/28/2015 SCORER dlf mjb	COMMENT	
NOTE: Complete All Items On This Form - Refer to	""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL NONE / NATURAL CHANN MODIFICATIONS:	NEL 🗌 RECOVERED 📄 RECOVERING 🔽 RECENT OR NO RECOVERY	
1. SUBSTRATE (Estimate percent of every type or (Max of 32). Add total number of significant subsr	f substrate presentCheck ONLY two predominant substrate TYPE boxes rate types found (Max of 8). Final metric score is sum of boxes A and B.)	:l ic
	TYPE PERCENT Point	ts
BLDR SLABS [16 pts] 0 BOULDER (>256 mm) [16 pts] 0 BEDROCK [16 pts] 0 COBBLE (65-256 mm) [9 pts] 0 GRAVEL (2-64 mm) [9 pts] 0 SAND (<2 mm) [6 pts]	SIL I [3 pt] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 FINE DETRITUS [3 pts] 0 ✓ CLAY or HARDPAN [0 pts] 100 MUCK [0 pts] 0 1 ARTIFICIAL [3 pts] 0 1	ıte 10
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	(A) Substrate Percentage 100 % (B) (A+B))
SCORE OF TWO MOST PREDOMINATE SUBSTRATE	TYPES 0 TOTAL NUMBER OF SUBSTRATE TYPES 1	
2. MAXIMUM POOL DEPTH (Measure the maxim evaluation. Avoid plunge pools from road culver	um pool depth within the 61 meter (200 ft)evaluation reach at the time of ts or storm water pipes) Pool Demonstration reach at the time of Max =	əpti 30
 > >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]	
	MAXIMUM POOL DEPTH (centimeters): 24	
BANK FULL WIDTH (Measured as the av > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	MAXIMUM POOL DEPTH (centimeters): 24 verage of 3-4 measurements) (Check ONLY one box): Bankfr ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Signature <=1.0m (<=3'3") [5 pts] Max =	ull h 30
COMMENTS: 3. BANK FULL WIDTH (Measured as the avoid of the second	MAXIMUM POOL DEPTH (centimeters): 24 verage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1.5	ull h 30
COMMENTS: 3. BANK FULL WIDTH (Measured as the avoid of the second	MAXIMUM POOL DEPTH (centimeters): 24 verage of 3-4 measurements) (Check ONLY one box): ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1.5 1.5	ull h 30
COMMENTS: 3. BANK FULL WIDTH (Measured as the average of the second secon	MAXIMUM POOL DEPTH (centimeters): 24 verage of 3-4 measurements) (Check ONLY one box): ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] Widtl Max = AVERAGE BANKFULL WIDTH (Meters): 1.5 information must also be completed 1.5 ALITY NOTE: River left (L) and Right (R) as looking downstream	ull h 30
COMMENTS: 3. BANK FULL WIDTH (Measured as the average of the second secon	MAXIMUM POOL DEPTH (centimeters): 24 /erage of 3-4 measurements) (Check ONLY one box): ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] Max = AVERAGE BANKFULL WIDTH (Meters): 1.5 Information must also be completed 1.5 ALITY NOTE: River left (L) and Right (R) as looking downstream DPLAIN QUALITY	ull h 30
COMMENTS: 3. BANK FULL WIDTH (Measured as the average of the second s	MAXIMUM POOL DEPTH (centimeters): 24 verage of 3-4 measurements) (Check ONLY one box): Image: State of the sta	full h 30
COMMENTS: 3. BANK FULL WIDTH (Measured as the average of the second s	MAXIMUM POOL DEPTH (centimeters): 24 verage of 3-4 measurements) (Check ONLY one box):	iull h 30
COMMENTS: 3. BANK FULL WIDTH (Measured as the average of the second	MAXIMUM POOL DEPTH (centimeters): 24 verage of 3-4 measurements) (Check ONLY one box):	iull 30

OhigEPA

) 🗌 Yes 🖌 I	No QHEI Score	e: (If yes, a	ttach completed QHEI form)	
DOWNSTREAM DE		5)			
WWH Name: Indian C	reek			Distance from Evaluated Strea	m
CWH Name:				Distance from Evaluated Strea	m
EWH Name:				Distance from Evaluated Strea	m
MAPPING: ATTAC	H COPIES OF MAPS	5, INCLUDING THE E	NTIRE WATERSHED ARE	A. CLEARLY MARK THE SITE LOC	ATION
ISGS Quadrangle Name: Ma	rtinsville		NRCS Soil Map Page:	47 NRCS Soil Map Stream	n Order: 0
County: Morgan		Township	/ City: Washington		
	IS				
ase flow conditions? (Y/N)	No Date of	of last precipitation:	10/28/2015	Quantity 0.45	
Photograph information:					_
Elevated Turbidity? (Y/N)	No Cano	py (% open):	30		
Vere samples collected for wa	ater chemistry? (Y/	N) No (Not	e lab sample no. or id. a	nd attach results) Lab number:	N/A
ield Measures: Temp (C)			, nH:	Conductivity (umbos/cm);	
	,		P		
BIOTIC EVALUA					
BIOTIC EVALUA Performed? (Y/N) No	TION (If Yes, record al ID number. Inclu	l observations. Vouch Ide apropriate field da	er collections optional. Not ta sheets from the Primary	e: all voucher samples must be labele Headwater Habitat Assessment Manu	ed with the site al.)
BIOTIC EVALUA Performed? (Y/N) No	(If Yes, record al ID number. Inclu Voucher? (Y/N)	l observations. Vouch ide apropriate field da Salamar	er collections optional. Not ta sheets from the Primary iders observed? (Y/N)	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N)	ed with the site al.)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N)	(If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc	l observations. Vouch Ide apropriate field da Salamar cher? (Y/N)	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) - Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou	ed with the site al.) icher? (Y/N)
BIOTIC EVALUA 'erformed? (Y/N) No ish observed? (Y/N) rogs or tadpoles observed? ('omments Regarding Biology	(If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc	l observations. Vouch ude apropriate field da Salamar cher? (Y/N)	er collections optional. Not ta sheets from the Primary iders observed? (Y/N) _ Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou	ed with the site al.) ucher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Sish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology	TION (If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc	l observations. Vouch ude apropriate field da Salamar cher? (Y/N)	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou	ed with the site al.) ucher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology	(If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc	l observations. Vouch ide apropriate field da Salamar cher? (Y/N)	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou	ed with the site al.) icher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology	(If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc	l observations. Vouch ude apropriate field da Salamar cher? (Y/N)	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou	ed with the site al.) ucher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Served? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology DRAWING AM	ITION (If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc ID NARRATIVE D	l observations. Vouch ude apropriate field da Salamar cher? (Y/N) ESCRIPTION OF S	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou	ed with the site al.) ucher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology: DRAWING AN Include important land	ATION (If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc Unarks and other feat	I observations. Vouch ude apropriate field da Salamar cher? (Y/N) ESCRIPTION OF S tures of interest for site	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) Aquatic Macroinvertebra STREAM REACH (This e evaluation and a narrative	te: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou <u>must be completed):</u> description of the stream's location	ed with the site al.) icher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Tish observed? (Y/N) Served? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology: DRAWING AN Include important land	(If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc : ID NARRATIVE D Imarks and other feat	l observations. Vouch ude apropriate field da Salamar cher? (Y/N) ESCRIPTION OF S tures of interest for site	er collections optional. Not ta sheets from the Primary inders observed? (Y/N) Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou <u>must be completed):</u> description of the stream's location	ed with the site al.) ucher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No ish observed? (Y/N) rogs or tadpoles observed? (comments Regarding Biology DRAWING AN Include important land	ATION (If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc : ID NARRATIVE D Imarks and other feat	l observations. Vouch ude apropriate field da Salamar cher? (Y/N) ESCRIPTION OF S tures of interest for site	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou <u>must be completed):</u> description of the stream's location	ed with the site al.) ucher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Served? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology: DRAWING AN Include important land	ATION (If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouc Imarks and other feat	l observations. Vouch ude apropriate field da Salamar cher? (Y/N) ESCRIPTION OF S tures of interest for site	er collections optional. Not ta sheets from the Primary nders observed? (Y/N) Aquatic Macroinvertebra	e: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou must be completed): description of the stream's location	ed with the site al.) ucher? (Y/N)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology: DRAWING AN Include important land	ATION (If Yes, record al ID number. Inclu Voucher? (Y/N) Y/N) Vouch Woucher? Vou	l observations. Vouch ude apropriate field da Salamar cher? (Y/N) ESCRIPTION OF S tures of interest for site	Aquatic Macroinvertebra	te: all voucher samples must be labele Headwater Habitat Assessment Manu Voucher? (Y/N) ates observed? (Y/N) Vou must be completed): description of the stream's location	ed with the site al.) ucher? (Y/N)

(Trees) (Trees) (Mowed Grass)

Dominant Veg. = Solidagoz Altissima, unknown grass (Mowed)



Stream S6S003b - facing upstream



Stream S6S003b - facing downsteam

ChieEPA Primary Headwat	er Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 31
SITE NAME/LOCATION UNT 2 Indian Creek	
SITE NUMBER S6S003c RIVE	R BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.005
LENGTH OF STEAM REACH (ft) LAT 39.401003	LONG86.448727 RIVER CODE N/A RIVER MILE N/A
DATE 10/28/2015 SCORER dlf mjb COMMEN	NT
NOTE: Complete All Items On This Form - Refer to ""Field E	Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL MODIFICATIONS:	RECOVERED 🗌 RECOVERING 🔽 RECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substra (Max of 32). Add total number of significant subsrate types	te presentCheck ONLY two predominant substrate TYPE boxes found (Max of 8). Final metric score is sum of boxes A and B.) Metric
BLDR SLABS [16 pts]	
BOULDER (>256 mm) [16 pts] 0 BEDROCK [16 pts] 0	LEAF PACK/WOODY DEBRIS [3 pts] 0 Substrate FINE DETRITUS [3 pts] 0 Max = 40
COBBLE (65-256 mm) [9 pts 0	CLAY or HARDPAN [0 pts]
SAND (<2 mm) [6 pts]	ARTIFICIAL [3 pts] 0 1
Total of Percentages of 0.00% (A) Bldr Slabs, Boulder, Cobble, Bedrock	Substrate Percentage 100 % (B) (A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES	0 TOTAL NUMBER OF SUBSTRATE TYPES 1
2. MAXIMUM POOL DEPTH (Measure the maximum pool evaluation. Avoid plunge pools from road culverts or storr	depth within the 61 meter (200 ft)evaluation reach at the time of m water pipes) Pool Dep
>>30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]
 >22.5 - 30 cm [30 pts] ✓ >10 - 22.5 cm [25 pts] 	<pre><5 cm [5 pts] No Water or Moist Channel [0 pts] 25</pre>
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 12
3. BANK FULL WIDTH (Measured as the average o	of 3-4 measurements) (Check ONLY one box): Bankful
> 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts]	$rac{1}{2}$ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Width ✓ $rac{1}{2}$ ($rac{1}{2}$ '3") [5 pts] Max = 3
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 0.8
This informat RIPARIAN ZONE AND FLOODPLAIN QUALITY	tion m <u>ust a</u> lso be completed NOTE: River left (L) and Right (R) as looking downstream
RIPARIAN WIDTH FLOODPLAIN C	QUALITY
L R (Per Bank L R (Most Pre	edominant Per Bank) L R
Wide >10 m Mature F	Forest, Wetland Conservation Tillage
Narrow <5 m	tial, Park, New Field Open Pasture, Row Crop
Comments: mowed grass and highway ramp	
FLOW REGIME (At time of evaluation) (Check C	NLY one box):
 Steam flowing Subsurface flow with isolated pools (interstitial) Comments: 	 Moist channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)
SINUOSITY (Number of bends per 61 m (200 ft) of	channel. Check ONLY one box)
✓ None 1.0 0.5 1.5	2.0 3.0 2.5 >3.0
STREAM GRADIENT ESTIMATE □ Flat (0.5 ft/100 ft) ✓ Flat to Moderate □ Moderate	ate (2 ft/100 ft)

QHEI PER			IOIIIIatioii	must also be comp	lete			
	FORMED	Yes 🖌 No	QHEI Score	e: (If yes, a	attach co	mpleted QHEI	form)	
DOWNSTE	REAM DESIGNA	TED USE(S)						
WWH Name:	Indian Creek				Distar	nce from Evalu	ated Stream	
CWH Name:					Distar	nce from Evalu	ated Stream	
EWH Name:					Distar	nce from Evalu	lated Stream	
MAPPING	: АТТАСН СОРІ	ES OF MAPS, INCL	UDING THE E	NTIRE WATERSHED AR	EA. CLEA	RLY MARK TH	E SITE LOCAT	ION
SGS Quadrangle N	ame: Martinsvil	lle		NRCS Soil Map Page:	47	NRCS Soil N	Map Stream C	Order: 0
ounty: Morgan			Township	/ City: Washington				
MISCEL	LANEOUS							
use flow conditions	? (Y/N) No	Date of last p	precipitation:	10/28/2015		Quantity	0.45	
otograph informati	on:	-						
evated Turbidity? (Y/N) No	Canopy (%	open):	100				
ere samples collect	ted for water che	mistry? (Y/N)	No (Note	e lab sample no. or id.	and attac	h results) Lab	number:	N/A
eld Measures:	Temp (C)	Dissolved ox	ygen (mg/l):	pH:	Co	onductivity (um	hos/cm):	
the sampling reach	representative o	of the stream? (Y/	N) Yes	If not, please explain:				
dditional comments	/description of po	ollution impacts:						
erformed? (Y/N) sh observed? (Y/N) rogs or tadpoles ob:	<u>No</u> (If Y ID n) <u>Voue</u> served? (Y/N) _	ies, record all observ umber. Include apro cher? (Y/N) Voucher? (rations. Vouch opriate field dat Salaman 	er collections optional. No a sheets from the Primary ders observed? (Y/N) Aquatic Macroinvertebr	ote: all vou / Headwate rates obs	icher samples m er Habitat Asses Voucher? (Y erved? (Y/N)	ust be labeled v sment Manual.) //N) Vouch	with the site
omments Regarding	g blology.							ier (1/in) _
omments Regarding DRA Include imp	WING AMD NAF	RATIVE DESCR and other features of	IPTION OF S interest for site	TREAM REACH (Thi e evaluation and a narrativ	s <u>must</u> b e descripti	e completed)	: 's location	er ((//N) _
omments Regarding DRA Include imp	WING AMD NAF	RRATIVE DESCR and other features of	IPTION OF S interest for site	P (Grass)	s <u>must</u> b e descripti	e completed)	: 's location	ei ((//N) _

Pominant Veg. = Reed Canary Grass, CarexisP, Unknown grass (Mowed)



Stream S6S003c - facing downsteam



Stream S6S003c - facing downsteam

Stream S6S004



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT to lake	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.005 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	8
IDEM 303(d) Listed:	No	Quarter:	SE
USACE Jurisdiction	Yes	Latitude:	39.403881
IDEM Jurisdiction:	Yes	Longitude:	-86.442693

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S004a	Ephemeral	Roadside Ditch	2.00	0.10	HHEI = 6	643	0.03	0.05
S6S004b	Ephemeral	Roadside Ditch	4.25	0.60	HHEI = 23	408	0.04	0.00
Total						1051	0.07	0.05

* Includes both permanent and temporary impacts

Approximately 1,051 feet (0.048 acre) of the roadside channel UNT 3 to Indian Creek will be relocated into a proposed new captured roadside channel. The OHWM of the UNT 3 to Indian Creek averages 2.0 to 4.3 feet wide by 0.1 to 0.6 feet deep. The new proposed relocated channel will consist of 1,495 feet (0.069 acre) of open natural bottom channel. The stream relocation will result in the gain of 444 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.



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

SITE NAME/LOCATION UNT to lake		
SITE NUMBER S6S004a RIV	/ER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.	005
LENGTH OF STEAM REACH (ft) LAT 39.4038	81 LONG86.442693 RIVER CODE N/A RIVER MILE N/A	
DATE 10/26/2015 SCORER ry kl COMMI	ENT	
NOTE: Complete All Items On This Form - Refer to ""Field	Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL NONE / NATURAL CHANNEL MODIFICATIONS:	RECOVERED RECOVERING RECENT OR NO RECOVER	RY
SUBSTRATE (Estimate percent of every type of substr (Max of 32). Add total number of significant subsrate type TYPE PERCENT BLDR SLABS [16 pts]	rate presentCheck ONLY two predominant substrate TYPE boxes H us found (Max of 8). Final metric score is sum of boxes A and B.) M TYPE PERCENT Image: SILT [3 pt] 0	HEI etric oints
BOULDER (>256 mm) [16 pts] 0 BEDROCK [16 pts] 0 COBBLE (65-256 mm) [9 pts] 0 GRAVEL (2-64 mm) [9 pts] 0 SAND (<2 mm) [6 pts]	LEAF PACK/WOODY DEBRIS [3 pts] 0 Sut FINE DETRITUS [3 pts] 0 Ma ✓ CLAY or HARDPAN [0 pts] 100 MUCK [0 pts] 0 0 ARTIFICIAL [3 pts] 0 0	ostrate x = 40 1
Total of Percentages of 0.00% (A) Bldr Slabs, Boulder, Cobble, Bedrock) Substrate Percentage 100 % (B) (A	A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPE	S 0 TOTAL NUMBER OF SUBSTRATE TYPES 1	
2. MAXIMUM POOL DEPTH (Measure the maximum poor evaluation. Avoid plunge pools from road culverts or sto	or water pipes)	ol Depth ax = 30
 > >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] 	0
COMMENTS		
	MAXIMUM POOL DEPTH (centimeters):	
3. BANK FULL WIDTH (Measured as the average	of 3-4 measurements) (Check ONLY one box):	ankfull
BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	MAXIMUM POOL DEPTH (centimeters): 0 of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3")	ankfull Vidth ax = 30
3. BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 0.6	ankfull Vidth ax = 30 5
BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 0.6	ankfull Vidth ax = 30 5
3. BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: This informa RIPARIAN ZONE AND FLOODPLAIN QUALITY	MAXIMUM POOL DEPTH (centimeters): 0 of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0m (<=3'3") AVERAGE BANKFULL WIDTH (Meters): 0.6 ation must also be completed NOTE: River left (L) and Right (R) as looking downstream	ankfull Vidth ax = 30 5
Second Processing Comment is: 3. BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: This information of the second processing of the second procesing of the second proc	MAXIMUM POOL DEPTH (centimeters): 0 of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 0.6 ation must also be completed NOTE: River left (L) and Right (R) as looking downstream QUALITY	ankfull Vidth ax = 30 5
COMMENTS: 3. BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] > 3.0 m - 4.0m (>9'7" - 4'8") [20 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: This information info	MAXIMUM POOL DEPTH (centimeters): 0 of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 0.6 ation must also be completed NOTE: River left (L) and Right (R) as looking downstream QUALITY Predominant Per Bank) L e Forest, Wetland Conservation Tillage ure Forest, Shrub or Old Field Urban or Industrial open Pasture, Row Crop Mining or Construction	ankfull Vidth ax = 30
3. BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>97" - 13') [25 pts] > 1.5 m - 3.0 m(>97" - 4'8") [20 pts] COMMENTS: This information of the second s	MAXIMUM POOL DEPTH (centimeters): 0 of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 0.6 ation must also be completed NOTE: River left (L) and Right (R) as looking downstream QUALITY Predominant Per Bank) L ation rust also of Old Field Open Pasture, Row Crop Mining or Construction ONLY one box): ONLY one box): Moist channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)	ankfull Vidth ax = 30 5
3. BANK FULL WIDTH (Measured as the average > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>97" - 13') [25 pts] > 1.5 m - 3.0 m(>97" - 4'8") [20 pts] COMMENTS: This information	MAXIMUM POOL DEPTH (centimeters): U of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0 m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 0.6 ation must also be completed NOTE: River left (L) and Right (R) as looking downstream QUALITY Predominant Per Bank) L at Forest, Wetland □ ure Forest, Shrub or Old Field □ Pasture □ ONLY one box): □ Moist channel, isolated pools, no flow (Intermittent) ✓ Dry channel, no water (Ephemeral)	ankfull Vidth ax = 30 5

QHEI PERFORMED Yes V No QHEI Score: (If yes, a	attach completed QHEI form)		
DOWNSTREAM DESIGNATED USE(S)			
WWH Name: Indian Creek	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 ARI	EA. CLEARLY MARK THE SITE LOCATION		
SGS Quadrangle Name: Martinsville NRCS Soil Map Page:	48 NRCS Soil Map Stream Order: 0		
ounty: Morgan Township / City: Washington			
MISCELLANEOUS			
ase flow conditions? (Y/N) No Date of last precipitation: 10/24/2015	Quantity 0.28		
notograph information:			
evated Turbidity? (Y/N) No Canopy (% open): 10			
ere samples collected for water chemistry? (Y/N) No (Note lab sample no. or id.	and attach results) Lab number: N/A		
eld Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):		
the sampling reach representative of the stream? (Y/N) Yes If not, please explain:			
Iditional comments/description of pollution impacts:			
BIOTIC EVALUATION			
erformed? (Y/N) No (If Yes, record all observations. Voucher collections optional. No ID number. Include apropriate field data sheets from the Primary	ote: all voucher samples must be labeled with the site y Headwater Habitat Assessment Manual.)		
sh observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N)	Voucher? (Y/N)		
ogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebr	rates observed? (Y/N) Voucher? (Y/N)		

DRAWING AMD NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

51 ver Pond



Stream S6S004a - facing upstream



Stream S6S004a - facing upstream

ChieEPA Primary Headwate	er Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)
SITE NAME/LOCATION UNT to lake	
SITE NUMBER S6S004b RIVER	BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.005
LENGTH OF STEAM REACH (ft) LAT 39.404376	LONG86.440953 RIVER CODE N/A RIVER MILE N/A
DATE 10/26/2015 SCORER ry kl COMMEN	т
NOTE: Complete All Items On This Form - Refer to ""Field Ev	aluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL	RECOVERED 🔲 RECOVERING 🔽 RECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate (Max of 32). Add total number of significant subsrate types for type of substrate type of substrate types for type of substrate type of substrate types for type of substrate type of s	# presentCheck ONLY two predominant substrate TYPE boxes HHEI Dund (Max of 8). Final metric score is sum of boxes A and B.) HHEI
GRAVEL (2-64 mm) [9 pts] 0 ✓ SAND (<2 mm) [6 pts] 60	MUCK [0 pts] 0 ARTIFICIAL [3 pts] 0
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A)	Check 100 % (B) (A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES	6 TOTAL NUMBER OF SUBSTRATE TYPES 2
2. MAXIMUM POOL DEPTH (Measure the maximum pool d evaluation. Avoid plunge pools from road culverts or storm	apth within the 61 meter (200 ft)evaluation reach at the time of water pipes) Pool Depth Max = 30
 >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
3. BANK FULL WIDTH (Measured as the average of □ > 4.0 meters (>13') [30 pts] □ >3.0 m - 4.0m (>9'7" - 13') [25 pts] □ >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	3-4 measurements) (Check ONLY one box): ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] Bankfull Width Max = 30
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 1.3
This information	on m <u>ust a</u> lso be completed
RIPARIAN ZONE AND FLOODPLAIN QUALITY	NOTE: River left (L) and Right (R) as looking downstream
RIPARIAN WIDTH FLOODPLAIN QU	JALITY
L R (Per Bank L R (Most Pred Wide >10 m Mature For Moderate 5-10 m Immature ✓ Narrow <5 m ✓ Residentia None Fenced P Comments:	Image: Speed of the system L R Image: Speed of the system Conservation Tillage Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system Image: Speed of the system
FLOW REGIME (At time of evaluation) (Check ON Steam flowing Subsurface flow with isolated pools (interstitial) Comments:	ILY one box): Moist channel, isolated pools, no flow (Intermittent) ✓ Dry channel, no water (Ephemeral)
SINUOSITY (Number of bends per 61 m (200 ft) of ch	nannel. Check ONLY one box)
✓ None 1.0 0.5 1.5	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
STREAM GRADIENT ESTIMATE Flat (0.5 ft/100 ft) Flat to Moderate Moderate	e (2 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be comp	<u>plete</u>
QHEI PERFORMED ☐ Yes ✔ No QHEI Score: (If yes,	attach completed QHEI form)
DOWNSTREAM DESIGNATED USE(S) WWH Name: Indian Creek CWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AR	REA. CLEARLY MARK THE SITE LOCATION
DSGS Quadrangie Name: Martinsville NRCS Soil Map Page:	• 48 NRCS Soil Map Stream Order: 0
Township / City. washington	
MISCELLANEOUS Base flow conditions? (Y/N) No Date of last precipitation: 10/24/2015	Quantity 0.28
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open): 60	
Vere samples collected for water chemistry? (Y/N) No (Note lab sample no. or id.	and attach results) Lab number: N/A
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):
s the sampling reach representative of the stream? (Y/N) Yes If not, please explain:	
BIOTIC EVALUATION Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. N ID number. Include apropriate field data sheets from the Primar	lote: all voucher samples must be labeled with the site y 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 Macroinverteb	prates observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
	is must be completed):
Include important landmarks and other features of interest for site evaluation and a narrativ	ve description of the stream's location
	1
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E Part ==	F
- E	

500 Aq Field



Stream S6S004b - facing upstream



Stream S6S004b - facing downsteam

Stream S6S008



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name: Sa	artor Ditch	Quadrangle:	Martinsville
Basin: Inc	dian Creek - Sand Creek	County:	Morgan
I4-digit HUC: 05	120201170070	Township:	T11N
Drainage area: 3.7	764 sq. mi.	Range:	R1E
Legal Drain: No	0	Section:	9
DEM 303(d) Listed: No	0	Quarter:	SW
JSACE Jurisdiction Ye	es	Latitude:	39.403834
DEM Jurisdiction: Ye	es	Longitude:	-86.430862

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S008a	Perennial	Channelized Ditch	12.07	1.43	QHEI = 37.5	0	0.00	0.00
S6S008b	Perennial	Channelized Ditch	14.53	1.63	QHEI = 34.5	56	0.02	0.00
S6S008c	Perennial	Culvert	11.27	1.23	N/A	32	0.01	0.00
S6S008d	Perennial	Roadside Ditch	11.27	1.23	QHEI = 23	773	0.20	0.00
S6S008e	Perennial	Culvert	11.27	1.23	N/A	60	0.02	0.00
S6S008f	Perennial	Culvert	12.23	1.27	N/A	271	0.08	0.00
S6S008g	Perennial	Channelized Ditch	12.23	1.27	QHEI = 38	357	0.10	0.00
S6S008h	Perennial	Channelized Ditch	10.87	1.37	QHEI = 36.5	756	0.19	0.00
S6S008i	Perennial	Culvert	11.00	1.50	N/A	0	0.00	0.00
S6S008j	Perennial	Channelized Ditch	11.00	1.50	QHEI = 47.5	185	0.05	0.00
S6S008k	Perennial	Culvert	11.00	1.50	N/A	0	0.00	0.00
S6S008l	Perennial	Channelized Ditch	21.00	1.20	QHEI = 45.5	162	0.08	0.00
S6S008m	Perennial	Culvert	21.00	1.20	N/A	19	0.01	0.00
S6S008n	Perennial	Culvert	18.00	1.00	N/A	0	0.00	0.00
S6S008o	Perennial	Channelized Ditch	18.00	1.00	QHEI = 32	0	0.00	0.00
Total				•	•	2671	0.74	0.00

* Includes both permanent and temporary impacts

Approximately 189 feet (0.049 acre) of Sartor Ditch will be temporarily impacted by the removal of the existing structure and construction of the new structure that carries Southview Drive over Sartor Ditch. No permanent impacts are anticipated for the construction of the proposed structure. The new bridge will span the OHWM and no permanent fill will be placed within the OHWM limits. The OWHM in this stretch of the UNT 3 to Sartor Ditch averages 4.6 feet wide by 0.1

to 0.6 feet deep. The existing crossing of Mahalasville Road over Sartor Ditch consists of a 15-foot span by 6.3-foot rise corrugated metal box culvert at Mahalasville Road which is 30 feet in length. This crossing is located at the downstream terminus of the Sartor Ditch relocation. Also as a part of the project, this road will be renamed to Southview Drive. The proposed crossing of Southview Drive over Sartor Ditch consists of a 36-foot wide by 14.08-foot-high three-sided concrete structure which is 47 feet in length. This structure will span the OHWM. The three-sided structure will be skewed such that the walls of the three-sided concrete structure are parallel with realigned Sartor Ditch. The total area of encapsulation 0.012 acre.

A temporary pump around and cofferdam will be required for approximately 180 days for removal of the existing piers. For reference to the temporary construction measures see the erosion control plan sheets included in the bridge plans. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary dewatering cofferdams are 189 feet in length for a total area of 0 49 acre and total volume 95 cubic yards of Class I or revetment riprap. Post construction, sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

This crossing is located at the downstream terminus of the Sartor Ditch relocation. Also as a part of the project, this road will be renamed to Southview Drive. Class I riprap will be placed at Bents No. 1 and 2 for scour protection at a depth of 2 feet, extending to the toe of slope. This work will result in 260 cubic yards (0.05 acre) of fill below the Q-100. This scour protection will not extend below the OHWM and will not permanently impact the stream.

There are no permanent impacts below the OHWM in this location. This new structure will result in 17 additional feet of encapsulation for which mitigation will be offered.

Approximately 188 feet (0.090 acre) of Sartor Ditch will be temporarily impacted by the removal of the existing 20 foot by 5-foot concrete box culvert that carries South Street over Sartor Ditch and construction of the new bridge. No permanent impacts are anticipated for the construction of the proposed structure. The new structure will span the OHWM and no permanent fill will be placed within the OHWM limits. The OHWM of Sartor Ditch in this area averages 21 feet wide by 1.2 feet deep. The existing crossing of South Street over Sartor Ditch consists of a single 20-foot span by 4.9-foot rise three-sided concrete arch which is 17 feet long. The proposed structure is a three-span bridge over Sartor Ditch which has a total length of 120-feet and is 44.9 feet wide. The three spans will be 36 feet, 48 feet, and 36 feet, respectively. There will be no change in bridge skew. The existing structure currently is open only to pedestrian traffic. Proposed Grand Valley Boulevard will be an overpass over I-69 and will tie into South Street. Therefore, the South Street crossing will be replaced in order to carry two lanes of traffic in addition to pedestrians. Note that riprap will be extended along the base of the retaining wall running north from South Street to York Street within the floodway of Sartor Ditch. This riprap will protect the retaining wall from floodway flows and will not be placed below the OHWM of Sartor Ditch.

A temporary pump around and cofferdam will be required for removal of the structure and installation of the new structure. For reference to the temporary construction measures see the erosion control plan sheets included in the bridge plans. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary dewatering cofferdams are 188 feet in length for a total area of 0.090 acre and total volume 200 cubic yards of Class I or revetment riprap. Post construction, sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

There are no permanent impacts below the OHWM in this location. Therefore, no mitigation is being offered for these temporary impacts.

Sartor Ditch from the outlet of the existing pipe carrying the Industrial Drive/entrance to the mobile home park south to the culvert carrying old Ohio Street/ new Southview Drive will be relocated. The OHWM of Sartor Ditch ranges from 10.9 to 21 feet wide by 1.2 to 1.6 feet deep. The existing channel is 2,262 linear feet (0.590 acre) and is crossed three times. These crossings include SR 37 over Sartor with two 84-inch CMPs which are 255 and 275 feet long respectively, Industrial Drive over Sartor in a 12 foot by 8 foot by 58-foot-long elliptical CMP, and Ohio Street over Sartor Ditch in a 20 foot by 5 foot by 64-foot-long concrete box culvert.

The proposed channel will consist of 2,318 feet (0.600 acre) of natural bottom channel and will be crossed three times. The proposed cross section of the relocated channel will be a 10-foot-wide channel with 2:1 sideslopes and a small floodway bench where possible. Portions of the old channel will be filled and portions may be used for stormwater detention or to continue stormwater drainage. The increase in stream length is 56 linear feet . The proposed structures at Ohio Street and Mahalasville Drive/Southview Drive are both 36-foot wide by 12-foot high three-sided concrete structures. The proposed crossing of SR 37/I-69 over Sartor Ditch consist of two single span composite prestressed concrete bridges that measure 88-foot long. The southbound bridge is 72-feet wide and the northbound bridge is 57-feet wide. As both Ohio Street and SR 37/I-69 are crossings of the relocated channel and those impacts are not included separately. Impacts associated with the replacement crossing at Mahalasville Road/Southview Drive are included under the crossing impacts.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around will be required. It would be the responsibility of the contractor to acquire an amendment to the permit for this temporary construction. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. This stream is being restored on-site and no mitigation is being offered for the impact to this stream.

IDEM		OWQ Bio	ological St	udies QHEI	(Qualitativ	ve Habitat E	valuatio	n Index)	
20	Sample #		bioSample #	Sarte Sarte	am Name or Ditch		Location		
1	Surveyor	Sample Date	County	Macro S	ample Type	Habitat		0	27.5
	ry	10/27/2015	Morgan	N/A		Complete	QHEI	Score:	37.5
1] SL	IBSTRATE	Check ONLY Two estimate %	predominant s 6 and check eve	ubstrate TYPE B ery type present	BOXES;	Check ON	E (Or 2 and	average)	
	BEST TYF INANT BLDR/SLABS [1 BOULDERS [9] COBBLE [8] GRAVEL [7] SAND [6] BEDROCK [5] ER OF BEST TY	PES: 4 or mo YPES: 4 or mo	OT PREDOMINANT PR HARDI DETRI DETRI MUCK SILT [2 ARTIF ore [2] (Sco sludg	HER TYPES PRES PAN [4] TUS [3] [2] [2] [CIAL [0]	ENT TOTAL %	ORIGIN LIMESTONE [1] TILLS [1] WETLANDS [0] HARDPAN [0] SANDSTONE [4 RIP/RAP [0] LACSTRINE [0] SHALE [-1] COAL FINES [-1]		QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1] EXTENSIVE [-2] MODERATE [-1] NORMAL [0] NONE [1]	Substrate 13.0 Maximum 20
Comm	nents								
2] IN quality; quality that is s % Amound 1 1 1 2 2 3 4 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3	STREAM CO 2-Moderate am in moderate or g stable, well devo unt UNDERCUT E OVERHANGII SHALLOWS (ROOTMATS [VER Indicate provents, but not of l greater amounts (eloped root wad in BANKS [1] NG VEGETATION [IN SLOW WATER [1]	resence 0 to 3 a nighest quality of e.g., very large deep/fast wate <u>% Amount</u> <u>— P</u> [1] <u> </u>	and estiamte per or in small amou boulders in deep r, or deep, well- OOLS>70CM [2] OOTWADS [1] OULDERS [1]	cent: 0-Absent; nts of highest qu o or fast water, la defined, functinc % Amount OXB OXB LOG	1- Very small ar Jality; 3- Highest arge diameter loo pal pools.) OWS, BACKWAT ATIC MACROPH S OR WOODY DI	nounts or if r C TERS [1] YTES [1] EBRIS [1]	more common c AMOI heck One (Or 2 : EXTENSIVE > MODERATE 2 SPARSE -<25 NEARLY ABS Cov Maximu	of marginal JNT and average) -75% [11] 5-75% [7] % [3] ENT <5% [1] /er _um _20 3.0
31 CH	ANNEL MOR	RPHOLOGY Ch	eck ONE in ead	h category (Or 2	2 and average)				
SINU HIG MOI LOV	DSITY H [4] DERATE [3] V [2] JE [1] Dents	DEVELOI ■ EXCELLE ■ GOOD [5] ■ FAIR [3] ■ POOR [1]	PMENT INT [7]	CHANNEI NONE [6] RECOVER RECOVER COVER	LIZATION RED [4] RING [3] DR NO RECOVE	ST. ☑ ŀ □ Ľ RY [1]	ABILITY HIGH [3] MODERATE LOW [1]	[2] Chanı Maxim	nel um 20 6.0
41 B/	NK EROSIO	N AND RIPARIA	AN ZONE CI	neck ONE in eac	h category for E	ACH BANK (Or	2 per bank a	ind average)	
River L R V I V I Comm	right looking downsi EROSION NONE/LITTLE [3 MODERATE [2] HEAVY/SEVERE	trea L R RIPA WIDE M WIDE M MODE M MODE N ARR VERY [1] ✓ NONE	ARIAN WID >50m [4] ERATE 10-50m [OW 5-10m [2] NARROW [1] [0]	TH L R FLC ↓ FOR 3] SCR RES ↓ FEN ↓ OPE	DOD PLAIN EST, SWAMP [3 UB OR OLD FIE IDENTIAL, PRK, CED PASTURE [N PASURE, ROV	QUALITY LD [2] NEW FIELD [1] [1] Indic VCROP [0] past	L R U COI U URI MIN cate predomi 100m riparia	NSERVATION T BAN OR INDUS IING/CONSTRU inant land use(s ^{an} Ripari Maximi	ILLAGE [1] IRIAL [0] CTION [0]
5] PC	OOL/GLIDE A	ND RIFFLE /RU	IN QUALITY						
MAXI Check	MUM DEPT ONE (ONLY! 1[6] <1m [4] <0.7m [2] <0.4m [1] m [0]	H CHAN Check ON ☐ POOL WI ✔ POOL WI ☐ POOL WI	NEL WIDTH IE (Or 2 and av DTH > RIFFLE \ DTH = RIFFLE \ DTH < RIFFLE \	I erage) VIDTH [2] VIDTH [1] VIDTH [0] ▼	CURRE Che TORRENTIAL VERY FAST [1] FAST [1] MODERATE [1 Indic	ENT VELOCI ck All that apply [-1] SLOV] INTE	TY RSTITIAL [-1 RMITTENT [- ES [1] ools and riffl	(Circle one and cor Primary C Primary C Secondar 2] Po Curre es Maximi	contact y Contact ol/ ant 12
Indica	te for functiona	l riffles [.] Best area	s must be large	enough to supp	ort a population	•••••			
of riffl RIFFL BES BES ✓ BES	e-obligate spec E DEPTH T AREAS>10cn T AREAS 5-10c T AREAS 5-10c T AREAS <5cm [metr metr	n [2] ■ MAXIN m [1] ▼ MAXIN ic=0]	EPTH IUM >50cm [2] IUM<50cm [1]	Check One RIFFLE/R STABLE (MOD. STA V UNSTABL	(Or 2 and avera UN SUBSTR e.g., Cobble, Bou BLE (e.g, Large E (e.g., Fine Frve	age) ATE RIF ulder) [2] Gravel) [1] el, Sand) [0]	FLE/RUN NONE [2] LOW [1] MODERA EXTENSIV	IO RIFFLE [MET EMBEDDE TE [0] Rifi VE [-1] Maximi	RIC=0] DNES Ie/ un 8 2.0
61 62		it/mi)		- I OW/ [2 - /l]		30 0/ С			
DRA	AINAGE ARE	Α (3.54 sq. mi.)	MODERATE	: [6 - 10] Y HIGH [10 - 6]	% RUN:	55 % RIFI		Gradie Maxim	ent um 10 6.0



A-CANOPY

Comment

✓ >85% - Open	Looking upstrea	am (>10m, 3 readi	ngs, <10m reading in mid	ddle); Round to the r	earest whole percent
55% -<85%		Left	Middle	Right	Total Average
30%-<55%	% open	%	%	%	%
10%-<30%					
<10% - Closed					
B-AESTHETICS			<u>C-REC</u>	<u>REATION</u>	
Nuisance algae	Oil sheen		Area	Depth	
Invasive macrophytes	✓ Trash/Litte	r	Pool: > 100ff	t ²	
Excess turbidity	Nuisance o	dor		<u> </u>	
Discoloration	Sludge dep	osits			
Foam/Scum	CSOs/SSO	s/Outfalls			
D-MAINTENANCE			<u>E-ISSU</u>	<u>ES</u>	
Public Private			WWT	P 🗌 CSO 🗌 I	NPDES
✓ Active Historic			🗌 Indus	try 🗌 Urban	
Succession: 🗌 Young 🗌	Old		Harde	ened 🗌 Dirt G	rime
🗌 Spray 🗌 Islands 📃 S	coured		Conta	minated 🗌 L	andfill
Snag: 🗌 Removed 🗌 M	odified		BMPs:	Construction	Sediment
Leveed: 🗹 One sided	Both banks		🗌 Loggi	ng 🗌 Irrigatio	n 🗌 Cooling
Relocated Cutoffs			Erosion:	✓ Bank	Surface
Bedload: Moving	Stable		False	bank 🗌 Manu	ire 🗌 Lagoon
Armoured Slumped	ł		Wash	H2O Tile	H2O table
Impounded Desiccat	ted		Mine:	Acid Qua	rry
Flood control	age		Flow:	Natural St	agnant
			Wetla	nd 🗌 Park 🗌	Issues: Golf
			Lawn	Home	
			Atmos	spheric depositi	on
				-	



Stream S6S008a - facing upstream



Stream S6S008a - facing upstream

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)									
	Sample #		bioSample #	Stre	eam Name		Location		
	Surveyor	Sample Date	County	Maara	Somple Type		•		
1	ry	10/27/2015	Morgan	N/A	Sample Type	Complete	' QHEI	Score:	34.5
1] SU	BSTRATE	Check ONLY Two estimate %	predominant su	bstrate TYPE ry type presen	BOXES; t	 Check (NE (Or 2 and	average)	
PREDOMIN P R B B B C C G G V S B	BEST TYF IANT LDR/SLABS [1 OULDERS [9] OBBLE [8] RAVEL [7] AND [6] EDROCK [5]	PES PRESENT TOTAL % 0] R R R R P R M M M M M M M M M M M M M	PREDOMINANT PREDOMINANT PREDOMINANT DETRIT DETRIT MUCK SILT [2 ARTIFI	HER TYPE PRE PAN [4] [US [3] [2] CIAL [0]	S SENT TOTAL % R 1 1 1	ORIGIN LIMESTONE TILLS [1] WETLANDS HARDPAN [0 SANDSTONE RIP/RAP [0] LACSTRINE	[1] [0] [0] [0]	QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1] EXTENSIVE [-2] MODERATE [-1]	Substrate
NUMBEI	R OF BEST T	YPES: 🗌 4 or mo ✔ 3 or les	ore [2] (Scor ss [0] ^{sludg}	e natural subs e from point-se	trates;ignore ources)	_ Shale [-1] ☐ Coal Fines	[-2]	Normal [0] None [1]	Maximum 20
Comme	ents								
2] INS quality; 2 quality ir that is st % Amour 2 1 	2-Moderate an a moderate or able, well devel t UNDERCUT E OVERHANGII SHALLOWS (ROOTMATS [VER Indicate pr nounts, but not of h greater amounts (eloped root wad in BANKS [1] NG VEGETATION [IN SLOW WATER]	resence 0 to 3 a highest quality o e.g., very large l deep/fast wate % Amount 1] P(1] R([1] B	nd estiamte pe r in small amo poulders in dee r, or deep, well DOLS>70CM [2 DOTWADS [1] DULDERS [1]	ercent: 0-Absen unts of highest of ep or fast water, l-defined, functir % Amount 2] OX AQ LO	t; 1- Very small quality; 3- Highe large diameter noal pools.) BOWS, BACKW UATIC MACROF GS OR WOODY	amounts or if i st log C ATERS [1] PHYTES [1] DEBRIS [1]	more common c AMOU heck One (Or 2 a EXTENSIVE > MODERATE 2 SPARSE -<25 NEARLY ABS Cov Maxim	of marginal JNT and average) -75% [11] 5-75% [7] % [3] ENT <5% [1] /er 20 2.0
31 CH	ANNEL MOR	RPHOLOGY Ch	eck ONE in eac	h category (Or	2 and average)				
SINUC HIGH MOD LOW NONI	251TY [4] ERATE [3] [2] E [1] E nts	DEVELOF EXCELLE GOOD [5] FAIR [3] ✓ POOR [1]	PMENT INT [7]	CHANNE NONE [6 RECOVE RECOVE RECENT	ELIZATION] RED [4] RING [3] OR NO RECOVI	S • •	TABILITY HIGH [3] MODERATE LOW [1]	[2] Chani Maximi	nel um 20 5.0
4] BA	NK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in ea	ach category for	EACH BANK (C)r 2 per bank a	and average)	
River r L R M M M H	ight looking downs EROSION ONE/LITTLE [3 ODERATE [2] EAVY/SEVERE ENTS	trea L R RIPA I WIDE MODE B] NARR I VERY [1] ✓ NONE	ARIAN WIDT >50m [4] RATE 10-50m [2 OW 5-10m [2] NARROW [1] [0]	H L R FL B C C C C C C C C C C C C C C C C C C C	.OOD PLAIN REST, SWAMP [RUB OR OLD FII SIDENTIAL, PRK NCED PASTURE EN PASURE, RC	I QUALITY 3] ELD [2] 5, NEW FIELD [1 [1] Int WCROP [0] pa	L R CO UR UR dicate predom st 100m ripari	NSERVATION T BAN OR INDUS IING/CONSTRU inant land use(s ^{an} Ripari Maxim	ILLAGE [1] TRIAL [0] CTION [0] 3) (an 10 4.5
5] <i>PO</i>	OL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Decreation	Detential
MAXIN Check C → 1 m 0.7 0.4 0.2 ✓ <0.2n Commo	AUM DEPT NE (ONLY! [6] <1m [4] <0.7m [2] <0.4m [1] n [0] ents	H CHAN Check ON POOL WI ✓ POOL WI POOL WI	NEL WIDTH IE (Or 2 and avo DTH > RIFFLE V DTH = RIFFLE V DTH < RIFFLE V	erage) /IDTH [2] /IDTH [1] /IDTH [0]	CURR Ch TORRENTIAI VERY FAST FAST [1] MODERATE Ind	ENT VELOC eck All that appl [-1] SL [1] INT [1] INT [1] ED [1] ED	CITY y OW [1] ERSTITIAL [-1 ERMITTENT [- DIES [1] pools and riffl	(Circle one and cor Primary C Primary C Secondar 2] Po Curre es Maximi	contact y Contact ol/ ent 12 2.0
Indicat	e for functiona	l riffles; Best area	s must be large	enough to sup	port a populatio	n			
of riffle RIFFL BEST ■ BEST ■ BEST Commo	-obligate spec E DEPTH AREAS>10cn AREAS 5-10c AREAS 5-10c AREAS <5cm [metr ents	RUN DE n [2] MAXIM m [1] MAXIM ic=0]	E PTH IUM >50cm [2] IUM<50cm [1]	Check On RIFFLE/F STABLE MOD. ST UNSTAB	e (Or 2 and aver RUN SUBSTI (e.g., Cobble, Bo ABLE (e.g, Larg LE (e.g., Fine Fr	rage) RATE RI pulder) [2] e Gravel) [1] vel, Sand) [0]	FFLE/RUN ✓ NONE [2] □ LOW [1] □ MODERA □ EXTENSI	IO RIFFLE [MET EMBEDDE TE [0] Riff VE [-1] Maximi	RIC=0] DNES [le/ un 8 2.0
61 GRA	DIENT (6.3 f	it/mi)	VERY I OW -	LOW [2 - 4]		15 % G	LIDE 5		
DRA	INAGE ARE	A (3.54 sq. mi.)	MODERATE	[6 - 10] / HIGH [10 - 6]	% RUN:	60 % RI		Gradie Maxim	ent um 6.0



A-CANOPY

Comment

✓ >85% - Open	Looking upstrear	m (>10m, 3 readi	ngs, <10m reading in mide	dle); Round to the n	earest whole percent				
55% -<85%		Left	Middle	Right	Total Average				
30%-<55%	% open	%	%	%	%				
10%-<30%	-								
<10% - Closed									
B-AESTHETICS			<u>C-RECR</u>	REATION					
Nuisance algae	Oil sheen		Area	Denth					
Invasive macrophytes	Trash/Litter			$2 \square > 3ft$					
Excess turbidity] Nuisance oc	lor							
Discoloration] Sludge depo	osits							
🗌 Foam/Scum 🗸	CSOs/SSOs	/Outfalls							
D-MAINTENANCE			E-ISSUE	ES					
Public V Private				<u></u>	NPDES				
Active Historic			☐ Indust	rv 🗸 Urban					
Succession: V Young	Old		Harder	ned 🗌 Dirt G	rime				
Spray Islands Sco	oured		Contaminated Landfill						
Snag: Removed Mod	lified		BMPs:	Construction	Sediment				
Leveed: V One sided	Both banks		Loggin	ng 🗌 Irrigation	n 🗌 Cooling				
Relocated Cutoffs			Erosion:	✓ Bank	Surface				
Bedload: 🗌 Moving 🗌 S	Stable		False b	bank 🗌 Manu	ire Lagoon				
Armoured Slumped			Wash I	H2O 🗌 Tile 🛛	H2O table				
Impounded Desiccated	k		Mine:	Acid Qua	rry				
Flood control Drainag	je		Flow:	Natural 🗌 St	agnant				
			Wetlan	nd 🗌 Park 🗌	Issues: Golf				
			Lawn	Home					
			Atmos	pheric deposition	on				





Stream S6S008b - facing downstream



Stream S6S008b - facing downsteam

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)										
20	Sample #		bioSample #	Strea Sarto	m Name r Ditch		Location			
	Survevor	Sample Date	County	Macro Sa	ample Type	Habita	t our	•		
211	ry kl	10/26/2015	Morgan	N/A		Complete		Score:	23	
1] SU	BSTRATE	Check ONLY Two estimate %	predominant su 6 and check eve	bstrate TYPE Bo bry type present	OXES;	Check (ONE (Or 2 and	average)		
	BEST TYF NANT BLDR/SLABS [1 BOULDERS [9] COBBLE [8] GRAVEL [7] GAND [6] BEDROCK [5]		PREDOMINANT P R HARDF DETRI MUCK SILT [2 ARTIFI	HER TYPES PRESE PAN [4] [US [3] [2]] CIAL [0]	NT TOTAL %	ORIGIN LIMESTONE TILLS [1] WETLANDS HARDPAN [0 SANDSTONE RIP/RAP [0] LACSTRINE	[1] [0] [0] [0]	QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1] EXTENSIVE [-2] MODERATE [-1]	Substrate	
NUMBE	ROFBEST	rPES: 4 or mo 3 or les	s [0] sludg	e from point-sou	rces)		[-2]	NONE [1]	Maximum 20	
Comm	ents									
2] INS quality; quality; that is s % Amou	STREAM CO 2-Moderate am n moderate or table, well deve table, well deve table, well deve table, well deve tuble UNDERCUT E OVERHANGII SHALLOWS (ROOTMATS [VER Indicate pr nounts, but not of h greater amounts (eloped root wad in BANKS [1] NG VEGETATION [IN SLOW WATER] 1]	resence 0 to 3 a nighest quality c e.g., very large l deep/fast wate % Amount [1] P [1] R [1] B	nd estiamte perc r in small amoun boulders in deep r, or deep, well-d OOLS>70CM [2] OOTWADS [1] OULDERS [1]	ent: 0-Absent ts of highest q or fast water, l efined, function % Amount OXE OXE LOC	; 1- Very small uality; 3- Highe arge diameter oal pools.) 30WS, BACKW JATIC MACROF SS OR WOODY	amounts or if log () ATERS [1] PHYTES [1] DEBRIS [1]	more common c AMOU heck One (Or 2 a EXTENSIVE > MODERATE 2 SPARSE -<250 NEARLY ABSI Cov Maximu	of marginal JNT and average) 75% [11] 5-75% [7] % [3] ENT <5% [1] ver 20 2.0	
31 CH	IANNEL MOP	RPHOLOGY Ch	eck ONE in eac	h category (Or 2	and average)					
SINU(HIGH MOD LOW NON	DSITY H [4] DERATE [3] / [2] HE [1] Dents	DEVELOF EXCELLE GOOD [5] FAIR [3] ✓ POOR [1]	PMENT INT [7]	CHANNEL NONE [6] RECOVERI ✓ RECOVERI ✓ RECENT O	IZATION ED [4] NG [3] R NO RECOVE	S ¥ RY [1]	TABILITY HIGH [3] MODERATE LOW [1]	[2] Chanr Maximu	nel Jm 20 7.0	
4] BA	NK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in each	n category for E	EACH BANK (C	Or 2 per bank a	and average)		
River	right looking downst EROSION IONE/LITTLE [3 IODERATE [2] IEAVY/SEVERE	L R RIPA I WIDE MODE B] NARR C[1] V V NONE	ARIAN WIDT >50m [4] RATE 10-50m [3 OW 5-10m [2] NARROW [1] [0]	H L R FLO Image: Second state	OD PLAIN EST, SWAMP [3 IB OR OLD FIE DENTIAL, PRK ED PASTURE I PASURE, RO	QUALITY] D [2] NEW FIELD [1 [1] In WCROP [0] pa	L R CO V V UR dicate predom ast 100m ripari	NSERVATION T BAN OR INDUST IING/CONSTRUC inant land use(s ^{an} Ripari Maximu	ILLAGE [1] (RIAL [0] CTION [0]) an 10 3.0	
5] PC	OL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Demotion	De te atiet	
MAXII Check () >1 m 0.7 - 0.4 - ✓ 0.2 - (0.2) Comm	MUM DEPT DNE (ONLY! <1m [4] <0.7m [2] <0.4m [1] m [0] eents	H CHAN Check ON POOL WI POOL WI ✓ POOL WI	NEL WIDTH JE (Or 2 and avo DTH > RIFFLE V DTH = RIFFLE V DTH < RIFFLE V	erage) VIDTH [2] VIDTH [1] VIDTH [0]	CURRI Che TORRENTIAL VERY FAST [FAST [1] MODERATE [Indi	ENT VELOC sck All that app [-1] V SL 1] IN 1] ED cate for reach -	CITY ly OW [1] TERSTITIAL [-1 TERMITTENT [DIES [1] · pools and riff	(Circle one and cor Primary C Primary C Secondar 2] Po Curre es Maximu	contact y Contact of/ ent 12 2.0	
Indica	te for functiona	l riffles; Best area	s must be large	enough to suppo	ort a populatior)				
of riffle RIFFL BES BES Comm	e-obligate spec E DEPTH T AREAS>10cn T AREAS 5-10c T AREAS 5-10c T AREAS <5cm [metr	ies: RUN DE n [2] MAXIM m [1] MAXIM ic=0]	E PTH IUM >50cm [2] IUM<50cm [1]	Check One (RIFFLE/RU STABLE (e MOD. STAF UNSTABLE	Or 2 and avera I N SUBSTF .g., Cobble, Bo BLE (e.g, Large E (e.g., Fine Frv	age) RATE RI ulder) [2] Gravel) [1] vel, Sand) [0]	☐ <u>I</u> IFFLE/RUN ☐ NONE [2] ☐ LOW [1] ✔ MODERA ☐ EXTENSI	IO RIFFLE [MET EMBEDDEI TE [0] Riff VE [-1] Maximi	<u>RIC=0]</u> DNES	
		t/mi)		1 0\W [2 /]		5 0/ 6				
DRA	INAGE ARE	4 (3.54 sq. mi.)		[6 - 10] (6 - 10] (HIGH [10 - 6]	% RUN:	95 % RI		Gradi e Maximu	ent um 10 6.0	
									-	

A-CANOPY

Comment

✓ >85% - Open	Looking upstrea	ım (>10m, 3 readir	ngs, <10m reading in mid	dle); Round to the ne	earest whole percent
55% -<85%		Left	Middle	Right	Total Average
30%-<55 %	% open	%	%	%	%
10%-<30%	•				
─ <10% - Closed					
B-AESTHETICS Nuisance algae Invasive macrophytes Excess turbidity Discoloration Foam/Scum	 Oil sheen ✓ Trash/Litter Nuisance of Sludge dep ✓ CSOs/SSOs 	dor osits s/Outfalls	<u>C-RECF</u> Area Pool:	REATION Depth ²	
D-MAINTENANCE			<u>E-ISSUI</u>	<u>ES</u>	
Public Private				🗸 CSO 🗌 N	NPDES
Active Historic			Indust	ry 🔽 Urban	
Succession: 🗌 Young 🗌	Old		Hardei	ned 🗌 Dirt Gr	ime
🗌 Spray 🗌 Islands 🗌 S	coured		Contai	minated 🗌 La	andfill
Snag: 🗌 Removed 🗌 Mo	odified		BMPs:	Construction	Sediment
Leveed: 🗌 One sided 🗌	Both banks		Loggir	ng 🗌 Irrigation	Cooling
Relocated Cutoffs			Erosion:	Bank S	Surface
Bedload: 🖌 Moving	Stable		False I	bank 🗌 Manu	re 🗌 Lagoon
Armoured Slumped	l		Wash	H2O Tile	H2O table
🗌 Impounded 📃 Desiccat	ed		Mine:	Acid Quar	ry
Flood control Drain	age		Flow:	Natural 🗸 St	agnant
			Wetlar	nd 🗌 Park 🗌	Issues: Golf
			Lawn	Home	
			Atmos	pheric deposition	on

Stream S6S008d - facing downsteam

Stream S6S008d - facing downsteam

Sample # blcSample # Stream Name Location Surveyer Sample Date County Macro Sample Type Habits QHEI Score: 33 Surveyer Sample Date County Macro Sample Type Check ONE (or 2 and average) Surveyer Semple Date Check ONE (or 2 and average) Check ONE (or 2 and average) BEST TYPES Semple Date Check ONE (or 2 and average) Surveyer Surveyer Surveyer Surveyer Survey (2) Mocreant (-1)	OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)									
Surveyor Sample Date County Macro Sample Type I Habitt QHEI Score: 38 1 SUBSTRATE County Macro Sample Type I Habitt QHEI Score: 38 1 SUBSTRATE Check ONE (Or 2 and average) Cleak ONE (Or 2 and average) QUALITY PERSONNENT PERSONNENT PERSONNENT PERSONNENT PERSONNENT PERSONNENT PERSONNENT		Sample #		bioSample #	Sart	am Name		Location		
Current of the control in the contr	-	Survovor	Sample Date	County	Macro S	ample Type				1
1) SUBSTRATE Check ONLY Two predominant substrate TYPE EDCES: Check ONE (Or. 2 and average) DEST TYPES OTHER TYPES OTHER TYPES ORIGIN QUALITY PECONNEXT PECONNEXT DELORS (S) OTHER TYPES ORIGIN QUALITY PECONNEXT PECONNEXT DELORS (S) MODERATE (L) Substrate ORIGIN QUALITY PECONNEXT PECONNEXT DELORS (S) MODERATE (L) Substrate MODERATE (L) Substrate PECONNEXT PECONNEXT MODERATE (L) MODERATE (L) MODERATE (L) Substrate PECONNEXT PECONNEXT MODERATE (L) MO	11	ry	10/27/2015	Morgan	N/A	ample Type	Complete		Score:	38
BEST TYPES OTHER TYPES ORIGN ULLITY PECMIMUM PESKIT TOTAL % PRECONNEMT PESKIT TOTAL % PRECONNEMT PESKIT TOTAL % PECMINESTORE [1] HENRY [2] BLDRESLARS [10] PERMIT PERMIT PESKIT TOTAL % PRECONNEMT PESKIT TOTAL % PECMINESTORE [1] WINESTORE [1] W	1] SU	BSTRATE	Check ONLY Two estimate %	predominant su and check eve	bstrate TYPE E	BOXES;	Check C	NE (Or 2 and	average)	
Image: Deprodick [5] Image: Comments Comments Image: Comments Im		BEST TYF NANT BLDR/SLABS [1 BOULDERS [9] COBBLE [8] GRAVEL [7] GAND [6]	PRESENT TOTAL %	PREDOMINANT PR HARDF DETRI DETRI SILT [2 ARTIFI	HER TYPES PRES PAN [4] P FUS [3] [2] [2] [2] [2] [2] [2] [2] [2] [2] [2		ORIGIN UIMESTONE TILLS [1] UETLANDS [HARDPAN [0 SANDSTONE RIP/RAP [0]	[1] □ 0] ∨ [0] □	QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1] EXTENSIVE [-2]	Substrate
20 Stortess (p) Continuents	III E Numbe	BEDROCK [5] R OF BEST T	YPES: 4 or mo	ore [2] (Scor	re natural subst le from point-so	rates;ignore	LACSTRINĖ SHALE [-1] COAL FINES	0]	Moderate [-1] Normal [0] Nonf [1]	Maximum
21 INSTREAM COVER Indicate presence 0 to 3 and estamte percent: 0-Absent; 1- Very small amounts or if more common of marginal AMOUNT quality in indicate presence 0 to 3 and estamte percent: 0-Absent; 1- Very small amounts or if more common of marginal AMOUNT quality in indicate presence 0 to 3 and estamte percent. 3-Absent; 1- Very small amounts or if more common of marginal AMOUNT dept for the percent of highest quality. 3- Highest quality and indicate presence 0 to 3 and estamte percent. 3-Absent; 1- Very small amounts or if more common of marginal AMOUNT dept for the percent of highest quality. 3- Highest quality and the percent of the percent of the percent of highest quality. 3- Highest quality and the percent of highest quality. 3- Highest quality and the percent of t	Comm	ents	V 3 or les	S [U]				[-] .		20
3) CHANNEL MORPHOLOGY Check ONE in each category (or 2 and average) SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY HIGH [4] MODERATE [3] EXCELLENT [7] NONE [6] HIGH [3] Channel Maximum 20 7.5 Comments FAIR [3] RECOVERD [4] MODERATE [2] Maximum 20 7.5 4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) Imaximum 20 7.5 Nove fini RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L R CONSERVATION TILAGE [1] 4 BANK EROSION MODERATE 10.50m [3] SCRUB OR OLD FIELD [2] URBAN OR INDUSTRIAL [0] URBAN OR INDUSTRIAL [0] MODERATE [2] MODERATE [1] MODERATE 10.50m [3] SCRUB OR OLD FIELD [2] URBAN OR INDUSTRIAL [0] INTRACOV NOT ILAGE [1] MODERATE [2] MODERATE [2] MODERATE [1] URBAN OR INDUSTRIAL [0] INTRACOV NOT ILAGE [1] INTRACOV NOT ILAGE [1] MODERATE [2] MODERATE [2] MODERATE [1] INTRACOV NOT ILAGE [1] <td>2] INS quality; quality; that is s % Amou</td> <td>STREAM CO 2-Moderate an n moderate or table, well devent table, well d</td> <td>VER Indicate pr nounts, but not of f greater amounts (eloped root wad in BANKS [1] NG VEGETATION [[IN SLOW WATER] [1]</td> <td>resence 0 to 3 a highest quality c e.g., very large l deep/fast wate % Amount P [1] R [1] B</td> <td>nd estiamte per r in small amou boulders in dee r, or deep, well- OOLS>70CM [2] OOTWADS [1] OULDERS [1]</td> <td>rcent: 0-Absent ints of highest of p or fast water, defined, functin % Amount OXI OXI AOI LOO</td> <td>t; 1- Very small a quality; 3- Higher large diameter I loal pools.) BOWS, BACKWA UATIC MACROP GS OR WOODY</td> <td>amounts or if i st og C ATERS [1] HYTES [1] DEBRIS [1]</td> <td>more common c AMOU Check One (Or 2 & EXTENSIVE > MODERATE 2 SPARSE -<25' NEARLY ABS Cov Maximu</td> <td>of marginal JNT and average) .75% [11] 5-75% [7] % [3] ENT <5% [1] /er _um 20 2.0</td>	2] INS quality; quality; that is s % Amou	STREAM CO 2-Moderate an n moderate or table, well devent table, well d	VER Indicate pr nounts, but not of f greater amounts (eloped root wad in BANKS [1] NG VEGETATION [[IN SLOW WATER] [1]	resence 0 to 3 a highest quality c e.g., very large l deep/fast wate % Amount P [1] R [1] B	nd estiamte per r in small amou boulders in dee r, or deep, well- OOLS>70CM [2] OOTWADS [1] OULDERS [1]	rcent: 0-Absent ints of highest of p or fast water, defined, functin % Amount OXI OXI AOI LOO	t; 1- Very small a quality; 3- Higher large diameter I loal pools.) BOWS, BACKWA UATIC MACROP GS OR WOODY	amounts or if i st og C ATERS [1] HYTES [1] DEBRIS [1]	more common c AMOU Check One (Or 2 & EXTENSIVE > MODERATE 2 SPARSE -<25' NEARLY ABS Cov Maximu	of marginal JNT and average) .75% [11] 5-75% [7] % [3] ENT <5% [1] /er _um 20 2.0
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY HIGH [4] EXCELLENT [7] WONE [6] WONE [6] HIGH [3] WODERATE [3] GOOD [5] RECOVERD [4] WODERATE [2] Channel Maximum AUNU [1] POOR [1] WECENT OR NO RECOVERY [1] WODERATE [2] Channel Maximum A BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) Conservation TILAGE [1] Nowe [1] POOR [1] KECOVERD [4] FOREST, SWAMP [3] URRAN OR NOUND TILAGE [1] MODERATE [1] WODE >50m [4] SOUB OR OLD FILD [2] URRAN OR NON ENDUSTRIAL [0] MONERATE [1] WODE NOT TRACE PRATE TO SON [3] VERY NARROW [1] SOUB OR OLD FILD [2] URRAN OR NOUND TRALL [0] MONERATE [1] WODE NOT TRACE WIDTH [2] WERY NARROW [1] SOUB OR OLD FILD [2] URRAN OR NOR NOR NOR NOR NOR NOR NOR NOR NOR	3] CH	IANNEL MOI	RPHOLOGY Ch	eck ONE in eac	h category (Or 2	2 and average)				
4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) River right looking downstrea L R RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L R V REROSION WIDE >50m [4] SCRUE OR OLD FIELD [1] L R CONSERVATION TILLAGE [1] V NONELITTLE [3] MODERATE 10-50m [3] SCRUE OR OLD FIELD [1] Image of the period mining of the poly with the period mining of the poly mining of the poly with the period mining of the poly wit	SINU(HIGH MOD LOW NON	DSITY 1 [4] DERATE [3] / [2] E [1] ents	DEVELOF □ EXCELLE □ GOOD [5] □ FAIR [3] ✓ POOR [1]	PMENT INT [7]	CHANNE NONE [6] RECOVER RECOVER RECOVER	LIZATION RED [4] RING [3] OR NO RECOVE	S • • •	TABILITY HIGH [3] MODERATE LOW [1]	[2] Chanı Maximi	nel um 20 7.5
Riverright looking downstrea L R RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L R L R EROSION WDE >50m (4) FOREST, SWAMP (3) L RCONSERVATION TILLAGE (1) MONE/LITTLE [3] WDE PATE [2] WARROW 5-10m [2] WINING/CONSTRUCTION [0] INRBAN OR INDUSTRIAL [0] MAXINUM CENTRE [1] WONE [0] RESIDENTIAL, PRK, NEW FIELD [1] Indicate predominant land use(s) Somments NONE [0] POOL/GLIDE AND RIFFLE /RUN QUALITY Recreation Potential MAXIMUM DEPTH CHANNEL WIDTH CHANNEL WIDTH Current VELOCITY Recreation Potential O.7 - c1m [4] POOL WIDTH - RIFFLE WIDTH [2] TORRENTIAL [-1] Storw FTALL [1] Prool/ Current [2] Moz - 4.0.7m [2] POOL WIDTH - RIFFLE WIDTH [0] TORRENTIAL [-1] EDDIES [1] Pool/ Current [2] Moz - 4.0.7m [2] POOL WIDTH - RIFFLE WIDTH [0] INTERSTITLAL [-1] Storward or contact Pool/ Maximum [4] 0.2 - c0.4m [1] Current [1] MAXIMUM Socm [2] MODERATE [6] RIFFLE/RUN SUBSTRATE Pool/ Maximum [4] 3.0 12 MAXIMUM Socm [2] MAXIMUM Socm [2] MAXIMUM Socm [2]	4] <i>BA</i>	NK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in eac	ch category for	EACH BANK (C	r 2 per bank a	and average)	
5] POOL/GLIDE AND RIFFLE /RUN QUALITY Recreation Potential MAXIMUM DEPTH Check ONE (ONLY! CHANNEL WIDTH Check ONE (OR 2 and average) CURRENT VELOCITY Check All that apply Recreation Potential 0.7 - <1m [4]	River	right looking downs EROSION IONE/LITTLE [3 IODERATE [2] IEAVY/SEVERE ents	trea L R RIP A N	ARIAN WIDT >50m [4] :RATE 10-50m [3 :OW 5-10m [2] NARROW [1] : [0]	H L R FL0 FOR SCR V RES FEN OPE	OOD PLAIN Rest, Swamp [: Rub or old fie Didential, prk ICED pasture IN pasure, ro	QUALITY 3] ELD [2] 5, NEW FIELD [1] [1] Inc WCROP [0] pa	L R UR UR UR Icate predom st 100m ripari	NSERVATION T BAN OR INDUS IING/CONSTRU inant land use(s ^{an} Ripari Maxim	LLAGE [1] (RIAL [0] CTION [0] an Jm 10 4.5
MAXIMUM DEPTH Check ONE (ORLY!	5] <i>PO</i>	OL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Pocroation	Dotontial
Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: RIFFLE DEPTH BEST AREAS>10cm [2] BEST AREAS>10cm [1] MAXIMUM >50cm [2] MAXIMUM >50cm [2] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [2] MAXIMUM >50cm [1] MAXIMUM >50cm [2] MOD. STABLE (e.g., Cobble, Boulder) [2] MOD. STABLE (e.g., Large Gravel) [1] MOD. STABLE (e.g., Fine Frvel, Sand) [0] Comments 6] GRADIENT (6.3 ft/mi) DRAINAGE AREA (3.54 sq. mi.) MODERATE [6 - 10] HIGH - VERY HIGH [10 - 6] MODERATE [6 - 10] MODERATE [6 - 10] MODER	MAXII Check () >1 m 0.7 - 0.4 - ✓ 0.2 - (0.21) Comm	MUM DEPT DNE (ONLY! [6] <1m [4] <0.7m [2] <0.4m [1] m [0] ents	H CHAN Check ON POOL WI ✓ POOL WI POOL WI	NEL WIDTH IE (Or 2 and avo DTH > RIFFLE V DTH = RIFFLE V DTH < RIFFLE V	erage) /IDTH [2] /IDTH [1] /IDTH [0]	CURR Che TORRENTIAL VERY FAST [FAST [1] MODERATE Indi	ENT VELOC eck All that appl [-[-1] V SL [1] INT [1] ED icate for reach -	F ITY / DW [1] ERSTITIAL [-1 ERMITTENT [- DIES [1] pools and riffl	(Circle one and cor Primary C I] Secondar -2] Po Curre Maximi	contact y Contact ol/ ent 12 3.0
of riffle-obligate species: Check One (Or 2 and average) NO RIFFLE [METRIC=0] RIFFLE DEPTH RUN DEPTH RIFFLE/RUN SUBSTRATE RIFFLE/RUN EMBEDDEDNES BEST AREAS >10cm [2] MAXIMUM >50cm [2] STABLE (e.g., Cobble, Boulder) [2] NONE [2] BEST AREAS 5-10cm [1] MAXIMUM >50cm [2] MOD. STABLE (e.g., Large Gravel) [1] NONE [2] MOD. STABLE (e.g., Fine Frvel, Sand) [0] MODERATE [0] Riffle/ MAXIMUM > 0 Comments VERY LOW - LOW [2 - 4] POOL: Ø GLIDE: Ø 6] GRADIENT (6.3 ft/mi) VERY LOW - LOW [2 - 4] % POOL: Ø % GLIDE: Ø DRAINAGE AREA (3.54 sq. mi.) HIGH - VERY HIGH [10 - 6] % RUN: 100 % RIFFLE: 0 Maximum 10	Indica	te for functiona	l riffles; Best area	s must be large	enough to supp	port a population	n			
6] GRADIENT (6.3 ft/mi) ✓ VERY LOW - LOW [2 - 4] % POOL: 0 % GLIDE: 0 DRAINAGE AREA (3.54 sq. mi.) □ MODERATE [6 - 10] □ MODERATE [6 - 10] □ MODERATE [6 - 10] Gradient Maximum 10	of riffle RIFFL BES BES ▼ BES	e-obligate spec E DEPTH T AREAS>10cn T AREAS 5-10c T AREAS <5cm [metr ents	ries: RUN DE n [2] ☐ MAXIM rm [1] ☑ MAXIM i ric=0]	EPTH IUM >50cm [2] IUM<50cm [1]	Check One RIFFLE/R STABLE (MOD. STA UNSTABL	e (Or 2 and aver UN SUBSTF (e.g., Cobble, Bo ABLE (e.g, Large LE (e.g., Fine Fro	rage) RATE RI pulder) [2] e Gravel) [1] vel, Sand) [0]	FFLE/RUN ■ NONE [2] ■ LOW [1] ■ MODERA ■ EXTENSI	NO RIFFLE [MET EMBEDDE EMBEDDE EMBEDDE RIFF TE [0] R VE [-1] Maximi	RIC=0] DNES
DRAINAGE AREA (3.54 sq. mi.)	61 GR4	DIENT (6.3.f	īt/mi)		I OW [2 - 4]		0%6)	
	DRA	INAGE ARE	A (3.54 sq. mi.)	MODERATE	[6 - 10] / HIGH [10 - 6]	% RUN:	100 % R I		Gradie Maxim	ent um 10 6.0

A-CANOPY

Comment

Looking upstrea	am (>10m, 3 read	ngs, <10m reading in mi	ddle); Round to the r	nearest whole percent
	Left	Middle	Right	Total Average
% open	%	%	%	%
•				
		C-REC	REATION	
Oil sheen		Area	Depth	
Trash/Litter	-	Pool: 🗌 > 100ft	t ² 🗌 > 3ft	
Nuisance o	dor			
Sludge dep	osits			
CSOs/SSOs	s/Outfalls			
		E-ISSU	IES	
		WWT		NPDES
		 Indus	trv 🗸 Urban	-
Old		Harde	ened 🗌 Dirt G	rime
coured		Conta	aminated 🗌 L	andfill
odified		BMPs:	Construction	Sediment
Both banks		Loggi	ing 🗌 Irrigatio	n 🗌 Cooling
		Erosion:	Bank	Surface
Stable		False	bank 🗌 Manu	ire Lagoon
		Wash	H2O Tile	H2O table
ed		Mine:	Acid Qua	rry
age		Flow:	Natural St	tagnant
		Wetla	nd 🗌 Park 🗌	Issues: Golf
		Lawn	✓ Home	
	Looking upstrea % open Oil sheen Trash/Litter Nuisance o Sludge dep CSOs/SSOs Old coured odified Both banks Stable ed age	Looking upstream (>10m, 3 readi Left % open% Oil sheen Trash/Litter Nuisance odor Sludge deposits CSOs/SSOs/Outfalls Old coured odified Both banks Stable ed age	Looking upstream (>10m, 3 readings, <10m reading in mi Left Middle % open%% Oil sheen% Trash/Litter Pool:> 100f Nuisance odor Sludge deposits CSOs/SSOs/Outfalls E-ISSU WWT Indus OldHarded couredConta both banksConta StableFalse Wash ageFlow: Wetla Lawn	Looking upstream (>10m, 3 readings, <10m reading in middle); Round to the r Left Middle Right % open%% C-RECREATION Area Depth 7 Trash/Litter Pool: > 100ft ² > 3ft Nuisance odor Sludge deposits CSOs/SSOs/Outfalls E-ISSUES WWTP CSO Industry V Urban Old Coured bdified BMPs: Construction Both banks Logging Irrigation Stable False bank Manu Wash H2O Tile [wetland Park Wetland Park [Lawn V Home

Stream S6S008g - facing downsteam

Stream S6S008g - facing upstream

Sample # bloSample # Stream Name Location Surveyor Sample Date County Macro Macro Ample Date County Macro Surveyor Sample Date County Macro Macro Ample Date Complete QHEI SCore: 36.5 1 Surveyor Sample Date County Macro Macro Chack ONE (of 2 and average) BEST TYPES Sample Date Chack ONE (of 2 and average) Chack ONE (of 2 and average) Chack ONE (of 2 and average) BEDERSTARE Chack ONE (of 2 and average) Chack ONE (of 2 and average) Substrate Comments Comments Chack ONE (of 2 and average) Substrate J WORERAF (0) Status Chack ONE (of 2 and average) Macro Comments Comments Chack ONE (of 2 and average) Macro J WORERAF (0) Worker (1 and worker (0 and average) Macro Macro Status Comments Comments Status Status Macro J WORERAF (0) Status Status Status Status Macro Status Status Sta	OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)										
Surveyor Sample Date County Macro Sample Type Complete QHEI Score: 36.5 1 SUBSTRATE Check ONE! (back County we predominant substate TYPE BOXEs: estimate's and check every type present Check ONE (or 2 and average) QUALITY Pressent PESSENT 1014.8 PESSENT 1014.8 Check ONE (or 2 and average) QUALITY Pressent PESSENT 1014.8 PESSENT 1014.8 Check ONE (or 2 and average) Substrate Pressent PESSENT 1014.8 PESSENT 1014.8 Check ONE (or 2 and average) Substrate Pressent PESSENT 1014.8 PESSENT 1014.8 <td></td> <td>Sample #</td> <td></td> <td>bioSample #</td> <td>Stre Sar</td> <td>am Name</td> <td></td> <td>Location</td> <td></td> <td></td>		Sample #		bioSample #	Stre Sar	am Name		Location			
Complete in the intervence intervence in the intervence	1000	Survovor	Sample Date	County	Macro S	amplo Type	🗌 Habitat				
1) SUBSTRATE Check ONLY Two predominant substrate TYPE EDCES: estimates is, and check vary type present Check ONE (Or 2 and average) DEST TYPES OTHER TYPES PREDUMENT PRESENT (DA. %, PREDOMINAT PRESENT (DA. %, PREDOMINAT UNDERSTORE [0] PRESENT (DA. %, PREDOMINAT UNDERSTORE [0] PRESENT (DA. %, PREDOMINAT EXEMPTION [3] PRESENT (DA. %, PREDOMINAT UNDERSTORE [0] PRESENT (PRES) Substrate PRESENT (PRES) Ormore [2] (Score natural substrates/proor SIALE [1] PRESENT (PRES) Ormore [2] (Score natural substrates/proor SIALE [1] PRESENT (PRES) Ormore [2] (Score natural substrates/proor SIALE [1] PRESENT (PRES) Ormore [2] (Score natural substrate anounts, put not of highest quality in nontaria manumuts of highest quality. Immediate anounts of highest quality. (Author (PRES)) PRESENT (PRES) Score matural substrate present (PRES) (Author (PRES)) PRESENT (PRES) Score matural substrate present (PRES) (Author (PRES)) PRESENT (PRES) MODERATE [2] (Author (PRES)) PRESONTONE [1]		ry	10/27/2015	Morgan	N/A	ample Type	Complete	QHEI	Score:	36.5	
BEST TYPES OTHER TYPES ORIGN ULLITY PECMIMUM PESKIT TOTAL % PRECONNEMT PESKIT TOTAL % PRECONNEMT PESKIT TOTAL % PECMINE 13 PECMINE 101 PECMI	1] S	UBSTRATE	Check ONLY Two estimate %	predominant su 6 and check eve	bstrate TYPE I ry type present	BOXES;	Check OI	NE (Or 2 and	average)		
Q 3 or less [0] sludge tom point-sources) □ COAL FINES [-2] □ NONE [1] 20 2] INSTREAM COVER Indicate presence 0 to 3 and estamte percent. 0-Absent; 1- Very small amounts or if more common of marginal AMOUNT quality: Inodecate amounts, but not of highest quality or is small amounts of highest quality: anodecate or greater amounts (e.g., every large bouldees to deep fast water, or deep, well-defined, functional pools.) Incention (f.g., every large bouldees (f.g., every large boul	PREDON P R	BEST TYF BLDR/SLABS [1 BOULDERS [9] COBBLE [8] GRAVEL [7] SAND [6] BEDROCK [5] ER OF BEST T	PES PRESENT TOTAL % PRESENT TOTAL %	OT PREDOMINANT P	HER TYPES PRES PUS [3] [2] [2] CIAL [0] e natural subst	SENT TOTAL %	ORIGIN LIMESTONE [TILLS [1] WETLANDS [0 HARDPAN [0] SANDSTONE RIP/RAP [0] LACSTRINE [0 SHALE [-1]		QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1] EXTENSIVE [-2] MODERATE [-1] NORMAL [0]	Substrate 13.0 Maximum	
Comments 21 INSTREAM COVER Indicate presence () to 3 and estiamite percent: 0-Absent; 1- Very small amounts or if more common of marginal AMOUNT Quality: in odderate amounts, but not of highest quality: on inderate or greater amounts (eg. very large bouldes in deep of ast vater, large diameter log that is stable, well developed root wad in deep/fast vater, or deep, well-defined, functineal pools.) Check Note (0: 2 and average) ** Amount ** SARE	_		✓ 3 or les	s [0] sludg	e from point-so	ources)	☐ COAL FINES [-2] □	NONE [1]	20	
2] JINS /REAM COVEN Indicate presence 0 to 3 and estamle percent: 0-Absert: 1- Very small anounts of mighted utality of manifel utality o	Comr	nents									
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 and average) SINUOSITY DEVELOPMENT CHANNEL/ZATION STABILITY HIGH [4] GOOD [5] FAIR [3] HIGH [3] MODERATE [2] Channel J. DWI [1] POOR [1] RECOVERED [4] MODERATE [2] Channel Maximum 20 J. BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) Image: Conservation TitLAGE [1] Image: Conservation TitLAGE [1] Image: Conservation TitLAGE [1] J. BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) Image: Conservation TitLAGE [1] Image: Conservation TitLAGE [1] MODERATE [2] Image: Conservation TitLAGE [1] Image: Conservation TitLAGE [1]<	quality quality that is % Amo	; 2-Moderate an in moderate or stable, well deve unt UNDERCUT E OVERHANGII SHALLOWS (ROOTMATS [VER Indicate pr nounts, but not of h greater amounts (eloped root wad in BANKS [1] NG VEGETATION [(IN SLOW WATER [1]	resence 0 to 3 a nighest quality o e.g., very large b deep/fast water % Amount P([1] Ri [1] B	nd estiamte pe r in small amou poulders in dee r, or deep, well- DOLS>70CM [2] DOTWADS [1] DULDERS [1]	rcent: U-Absent unts of highest q p or fast water, .defined, functin % Amount Amount OXE OXE OXE	;; 1- Very small a uality; 3- Highes large diameter lo oal pools.) BOWS, BACKWA JATIC MACROPH GS OR WOODY D	TERS [1]	AMOI AMOI heck One (Or 2 a EXTENSIVE > MODERATE 2 SPARSE -<25 NEARLY ABS Cov Maximu	of marginal JNT and average) -75% [11] 5-75% [7] % [3] ENT <5% [1] /er 20 4.0	
SiNUOSITY DEVELOPMENT CHANNELIZATION STABILITY HGH 4 EXCLLENT [7] RECOVERING [3] HGH 3 MODERATE [3] POOR [1] RECOVERING [3] HGH 3 MODERATE [2] Channel Channel Maximum MODERATE [2] Comments 000000000000000000000000000000000000	3] C	HANNEL MO	RPHOLOGY Ch	eck ONE in eac	n category (Or	2 and average)					
4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) River right looking downstrea L R RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L R L R EROSION WIDE >50m [4] CONSERVATION TILLAGE [1] UBBAN OR INDUSTRIAL [0] UBBAN OR INDUSTRIAL [0] MODERATE [2] NARROW 5-10m [2] CRUB OR OLD FIELD [1] Indicate predominant land use(s) Indicate predominant land use(s) MODERATE [1] V PRY NARROW [1] FENCED PASTURE [1] Indicate predominant land use(s) Riparian 5] POOL/GLIDE AND RIFFLE /RUN QUALITY Check ONE (OT 2 and average) CHANNEL WIDTH CHRENT VELOCITY Recreation Potential 0.7 - <im [4]<="" td=""> POOL WIDTH > RIFFLE WIDTH [2] TORRENT VELOCITY Cicicle one and comment on back) 0.4 - <0.7m [2]</im>	SINU HIG MO LOV V NO	OSITY H [4] DERATE [3] N [2] NE [1] nents	DEVELOF ■ EXCELLE GOOD [5] ■ FAIR [3] ▼ POOR [1]	PMENT ENT [7] 	CHANNE NONE [6] RECOVEI RECOVEI	LIZATION RED [4] RING [3] OR NO RECOVE	S1 ✓ □ :RY [1]	ABILITY HIGH [3] MODERATE LOW [1]	[2] Chani Maximi	nel um 20 6.0	
River right looking downstreal L R RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L R L R EROSION WDDE sATE [1] CONSERVATION TILLAGE [1] UDBEATE [1] Indicate predominant land use(s) Riparian Naxioung 3.5 Comments NONE [0] NONE [0] CURRENT VELOCITY Recreation Potential Recreation Potential Comments Check ONE (0r 2 and average) CURRENT VELOCITY Recreation Potential Recreation Potential 0.1 ~ 1m [6] POOL WIDTH > RIFFLE WIDTH [2] DORENTRIAL [-1] INTERSTITAL [-1] INTERSTITAL [-1] Pool/ Pool/ Pool/ 0.2 ~ 0.3 m [1] POOL WIDTH = RIFFLE WIDTH [2] DORENTRIAL [-1] INTERSTITAL [-1] INTERSTITAL [-1] Pool/ Pool/ Quarter 0.4 ~ 0.7 m [2] POOL WIDTH = RIFFLE WIDTH [1] INTERSTITAL [-1] INTERSTITAL [-1] INTERSTITAL [-1] INTERSTITAL [-1] Pool/ Quarter Pool/ Quarter	4] B.	ANK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in ea	ch category for l	EACH BANK (Or	2 per bank a	and average)		
5] POOL/GLIDE AND RIFFLE /RUN QUALITY Recreation Potential MAXIMUM DEPTH Check ONE (ONLY! CHANNEL WIDTH Check ONE (OY 2 and average) CURRENT VELOCITY Check All that apply Recreation Potential (Circle one and comment on back) 0.7 - <1m [4]	Rive L R V Comr	r right looking downs EROSION NONE/LITTLE [3 MODERATE [2] HEAVY/SEVERE nents	trea L R RIPA N WIDE MODE B] NARR E [1] ✔ ✔ NONE	ARIAN WIDT >50m [4] RATE 10-50m [3 OW 5-10m [2] NARROW [1] [0]	H L R FL FOF SCF ✓ ✓ RES FEN OPF	OOD PLAIN Rest, Swamp [3 Rub or old fie Sidential, Prk Iced Pasture En Pasure, Ro	QUALITY 3] 5LD [2] , NEW FIELD [1] [1] Indi WCROP [0] pas	L R D CO UR UR icate predom t 100m ripari	NSERVATION T BAN OR INDUS IING/CONSTRU inant land use(s ^{an} Ripari Maximu	ILLAGE [1] IRIAL [0] CTION [0] an JM 10 3.5	
MAXIMUM DEPTH Check ONE (ORLY! CHANNEL WIDTH Check ONE (OZ and average) CURRENT VELOCITY Check All that apply Rectautor Potential (Circle one and comment on back) > 1 m [6] POOL WIDTH > RIFFLE WIDTH [2] ORRENTIAL [-1] SLOW [1] Primary Contact 0.7 - <1m [4]	5] <i>P</i> (OOL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Decreation	Detential	
Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: RIFFLE DEPTH BEST AREAS >10cm [2] BEST AREAS >10cm [1] MAXIMUM >50cm [2] MAXIMUM >50cm [2] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [2] MOD. STABLE (e.g., Cobble, Boulder) [2] MOD. STABLE (e.g., Large Gravel) [1] MOD. STABLE (e.g., Fine Frvel, Sand) [0] Comments 6] GRADIENT (6.3 ft/mi) DRAINAGE AREA (3.47 sq. mi.) MAXIMUM > LOW [2 - 4] MODERATE [6 - 10] HIGH - VERY HIGH [10 - 6] MODERATE [6 - 10] MODERATE [6 - 10] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [6 - 10] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [5] MODERATE [6 - 10] MODERATE [5] MODERATE [5]	MAX Check ○ >1 ○ 0.7 ○ 0.4 ○ 0.2 ✓ <0.2	MUM DEPT ONE (ONLY! n [6] - <1m [4] - <0.7m [2] - <0.4m [1] 2m [0] nents	H CHAN Check ON POOL WI ✓ POOL WI POOL WI	NEL WIDTH JE (Or 2 and ave DTH > RIFFLE W DTH = RIFFLE W DTH < RIFFLE W	erage) /IDTH [2] /IDTH [1] /IDTH [0]	CURR Che TORRENTIAL VERY FAST [FAST [1] MODERATE [Indi	ENT VELOC cck All that apply [-1] SLO 1] INTE [1] EDD cate for reach - p	ITY W [1] ERSTITIAL [-1 ERMITTENT [- NES [1] Dools and riffl	(Circle one and cor Primary C Primary C Secondar 2] Po Curre es Maximi	oriential nment on back) contact y Contact ol/ ent 12 2.0	
of riffle-obligate species: Check One (Or 2 and average) NO RIFFLE [METRIC=0] RIFFLE DEPTH RUN DEPTH RIFFLE/RUN SUBSTRATE RIFFLE/RUN EMBEDDEDNES BEST AREAS>10cm [1] MAXIMUM >50cm [2] STABLE (e.g., Cobble, Boulder) [2] NONE [2] BEST AREAS 5-10cm [1] MAXIMUM >50cm [1] MAXIMUM <50cm [1]	Indic	ate for functiona	al riffles; Best areas	s must be large	enough to supp	oort a populatior	 ו				
6] GRADIENT (6.3 ft/mi) ✓ VERY LOW - LOW [2 - 4] % POOL: 3 % GLIDE: 2 DRAINAGE AREA (3.47 sq. mi.) ☐ MODERATE [6 - 10] ☐ MODERATE [6 - 10] Gradient Maximum 10 ☐ HIGH - VERY HIGH [10 - 6] % RUN: 90 % RIFFLE: 5 Gradient Maximum 10	of riff RIFF BES BES V BES	le-obligate spec LE DEPTH ST AREAS>10cn ST AREAS 5-10c ST AREAS 5-10c ST AREAS <5cm [metr nents	ries: RUN DE n [2] ☐ MAXIM rm [1] ☑ MAXIM i ric=0]	E PTH IUM >50cm [2] IUM<50cm [1]	Check One RIFFLE/R STABLE (MOD. ST/ UNSTABL	e (Or 2 and aver UN SUBSTF (e.g., Cobble, Bo ABLE (e.g, Large LE (e.g., Fine Fry	age) RATE RIF oulder) [2] e Gravel) [1] rel, Sand) [0]	☐ <u>1</u> FFLE/RUN ☐ NONE [2] ✔ LOW [1] ☐ MODERA ☐ EXTENSI	IO RIFFLE [MET EMBEDDE EMBEDDE E [0] R F [0] R VE [-1] Maximi	RIC=0] DNES [le/ um 8 2.0	
DRAINAGE AREA (3.47 sq. mi.) MODERATE [6 - 10] % RUN: 90 % RIFFLE: 5 Gradient Maximum 10 HIGH - VERY HIGH [10 - 6] % RUN: 90 % RIFFLE: 5 10	6] GR	ADIENT (6.3 f	īt/mi)	VERY LOW -	LOW [2 - 4]		3 % GI	_IDE: 2			
	DR	AINAGE ARE	A (3.47 sq. mi.)	MODERATE	[6 - 10] ' HIGH [10 - 6]	% RUN:	90 % RIF	FLE: 5	Gradie Maxim	ent um 10 6.0	

A-CANOPY

Comment

✓ >85% - Open	Looking upstrea	m (>10m, 3 read	ings, <10m reading in mid	ddle); Round to the n	earest whole percent
55% -<85%		Left	Middle	Right	Total Average
30%-<55%	% open	%	%	%	%
10%-<30%	•				
─ <10% - Closed					
B-AESTHETICS			<u>C-REC</u>	REATION	
Nuisance algae	Oil sheen		Area	Depth	
Invasive macrophytes	Trash/Litter		Pool: 🗌 > 100ft	2 > 3ft	
Excess turbidity	Nuisance or	lor			
Discoloration	Sludge depe	osits			
Foam/Scum	CSOs/SSOs	/Outfalls			
D-MAINTENANCE			<u>E-ISSU</u>	<u>ES</u>	
Public Private			WWTI	P 🗌 CSO 🗌 I	NPDES
✓ Active ☐ Historic			lndus	try 🖌 Urban	
Succession: 🔽 Young 🗌	Old		Harde	ened 🗌 Dirt G	rime
🗌 Spray 🗌 Islands 🗌 S	coured		Conta	minated 🗌 L	andfill
Snag: 🗌 Removed 🗌 Mo	odified		BMPs:	Construction	Sediment
Leveed: 🗌 One sided 🗌	Both banks		Loggi	ng 🗌 Irrigatior	n 🗌 Cooling
Relocated Cutoffs			Erosion:	🗸 Bank 🗌 🤅	Surface
Bedload: 🗌 Moving	Stable		False	bank 🗌 Manu	re 🗌 Lagoon
Armoured Slumped	l		Wash	H2O Tile	H2O table
🗌 Impounded 📃 Desiccat	ed		Mine:	Acid 🗌 Qua	rry
Flood control Drain	age		Flow:	Natural 🖌 St	agnant
			Wetla	nd 🗌 Park 🗌	Issues: Golf
			Lawn	Home	
			Atmos	spheric deposition	on

Stream S6S008h - facing downsteam

Stream S6S008h - facing upstream

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)									
	Sample #	Sample #		bioSample # Stream Name			Location		
1000	Surveyor	Sample Date	County	Maara	Somple Type				
1	jk lo	10/28/2015	Morgan	N/A	Sample Type	Complete	," QHEI	Score:	47.5
1] SU	IBSTRATE	Check ONLY Two estimate %	predominant su and check eve	bstrate TYPE by type preser	BOXES; it	Check	ONE (Or 2 and	average)	,
	BEST TYF NANT BLDR/SLABS [1 BOULDERS [9] COBBLE [8] GRAVEL [7] SAND [6] BEDROCK [5]	PRESENT TOTAL % PRESENT TOTAL % 10] P R P R P R 10] J S 10 J J S 10 J J S 10 J S 10 S 10 J S 10 J S 10 S 1 S 10 S 1 S 1 S 1 S 1 S 1 S 1 S	PREDOMINANT PR HARDF DETRIT DETRIT MUCK SILT [2 ARTIFIC	HER TYPE PRE PRE PRE PRE PRE PRE PRE P	S SENT TOTAL % R B B B C C C C C C C C C C C C C C C C	ORIGIN ✓ LIMESTONE TILLS [1] WETLANDS HARDPAN [SANDSTON RIP/RAP [0] LACSTRINE	I [0] [0] E [0] [0]	QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1] EXTENSIVE [-2] MODERATE [-1]	Substrate
NUMBE	R OF BEST T	YPES: ✔ 4 or mo	ore [2] (Scor s [0] ^{sludg}	e natural subs e from point-s	trates;ignore ources)	SHALE [-1]	S [-2]	Normal [0] None [1]	Maximum 20
Comm	ents								
2] //X quality; quality i that is s % Amou 10 1 20 2 40 2 15 1 Comm	STREAM CO 2-Moderate an n moderate or table, well devi- int UNDERCUT E OVERHANGII SHALLOWS (ROOTMATS	VER Indicate pr nounts, but not of h greater amounts (eloped root wad in BANKS [1] NG VEGETATION [(IN SLOW WATER) [1]	resence 0 to 3 a highest quality o e.g., very large b deep/fast water % Amount 1 10 1 R(11 0 1 B	nd estiamte pe r in small amo poulders in dea r, or deep, wel DOLS>70CM [2 DOTWADS [1] DULDERS [1]	ercent: 0-Absen unts of highest of ep or fast water, I-defined, functin % Amount 2] OX _101_ AC _151_ LO	nt; 1- Very smal quality; 3- High large diameter hoal pools.) BOWS, BACKV DATIC MACRO GS OR WOODY	I amounts or if est log (VATERS [1] PHYTES [1] / DEBRIS [1]	more common c AMOU Check One (Or 2 a EXTENSIVE > MODERATE 2 SPARSE -<25 NEARLY ABS Cov Maxim	of marginal UNT and average) 575% [11] 5-75% [7] % [3] ENT <5% [1] ver 20 14.0
31 CH	IANNEL MOI	RPHOLOGY Ch	eck ONE in eac	h category (Or	2 and average)				
SINU(HIGH MOE LOW NON	DSITY 1 [4] DERATE [3] / [2] IE [1] ents	DEVELOF ■ EXCELLE ■ GOOD [5] ■ FAIR [3] ■ POOR [1]	PMENT INT [7]	CHANNE NONE [6 RECOVE RECOVE RECOVE	ELIZATION] RED [4] RING [3] OR NO RECOV	ERY [1]	HIGH [3] MODERATE LOW [1]	[2] Chanı Maximi	nel um 20 7.0
4] BA	NK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in ea	ach category for	EACH BANK (Or 2 per bank a	and average)	
River	right looking downs EROSION IONE/LITTLE [3 IODERATE [2] IEAVY/SEVERE	trea L R RIPA N WIDE MODE B] NARR [1] ✓ VERY [1] NONE	ARIAN WIDT >50m [4] :RATE 10-50m [3 OW 5-10m [2] NARROW [1] [0]	H L R FL FO SC ✓ ✓ RE FE OP	.OOD PLAIN REST, SWAMP RUB OR OLD FI SIDENTIAL, PRI NCED PASTURE EN PASURE, RC	i QUALITY [3] ELD [2] {, NEW FIELD [[1] Ir DWCROP [0] P	L R D CO UR I] UR Idicate predom ast 100m ripari	NSERVATION T BAN OR INDUS IING/CONSTRU inant land use(s ^{an} Ripari Maxim	ILLAGE [1] TRIAL [0] CTION [0] s) jan um 10 4.5
5] <i>PC</i>	OL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Decreation	Dotontial
MAXII Check (□ >1 m □ 0.7 - □ 0.4 - ✔ 0.2 - □ <0.2 Comm	MUM DEPT DNE (ONLY! 1[6] <1m [4] <0.7m [2] <0.4m [1] m [0] eents	H CHAN Check ON POOL WI ✓ POOL WI POOL WI	NEL WIDTH IE (Or 2 and ave DTH > RIFFLE W DTH = RIFFLE W DTH < RIFFLE W	erage) /IDTH [2] /IDTH [1] /IDTH [0]	CURF Ch TORRENTIA VERY FAST FAST [1] MODERATE	RENT VELO eck All that app L [-1] SI [1] IN [1] IN [1] EI [1] EI [1] EI	CITY JOW [1] TERSTITIAL [-1 TERMITTENT [DDIES [1] - pools and riff	(Circle one and cor Primary C I] Secondar -2] Po Curre Maximi	Contact ry Contact of/ ent 12 3.0
Indica	te for functiona	l riffles; Best area	s must be large	enough to sup	port a populatio	n			
of riffe RIFFL ■ BES ■ BES ■ BES Comm	e-obligate spec E DEPTH T AREAS>10cn T AREAS 5-10c T AREAS <5cm [metr cents	ries: RUN DE n [2] ☐ MAXIM rm [1] ☑ MAXIM i ric=0]	E PTH IUM >50cm [2] IUM<50cm [1]	Check On RIFFLE/F STABLE MOD. ST UNSTAB	e (Or 2 and ave RUN SUBST (e.g., Cobble, B ABLE (e.g., Larg LE (e.g., Fine Fr	rage) RATE R oulder) [2] e Gravel) [1] vel, Sand) [0]	IFFLE/RUN NONE [2] LOW [1] ✓ MODERA EXTENSI	NO RIFFLE [MET EMBEDDE TE [0] Riff VE [-1] Maxim	RIC=0] DNES fle/ um 8
61 GR4	DIENT (6.3 f	īt/mi)	VFRY I OW -	I OW [2 - 4]	% POOL ·	30 %		D	
DRA	INAGE ARE	A (3.47 sq. mi.)	MODERATE	[6 - 10] / HIGH [10 - 6]	% RUN:	% R		Gradie Maxim	ent um 6.0
				-					

🗌 Wash H2O 📋 Tile 🗌 H2O table

Mine: Acid Quarry

Lawn Home Atmospheric deposition

Flow: V Natural Stagnant □ Wetland □ Park □ Issues: Golf

A-CANOPY					
🗌 >85% - Open	Looking upstre	am (>10m, 3 rea	dings, <10m reading in mi	iddle); Round to the i	nearest whole percent
55% -<85%		Left	Middle	Right	Total Average
✓ 30%-<55%	% open	%	%	%	%
10%-<30%	•				
─ <10% - Closed					
B-AESTHETICS			<u>C-REC</u>	REATION	
Nuisance algae	Oil sheen		Area	Depth	
Invasive macrophytes	Trash/Litte	r	Pool:	t ² > 3ft	
Excess turbidity	🗸 Nuisance d	odor			
Discoloration	🗌 Sludge dej	oosits			
Foam/Scum	CSOs/SSO	s/Outfalls			
D-MAINTENANCE			<u>E-ISSU</u>	<u>IES</u>	
Public Private			WWT	P CSO	NPDES
Active Historic			lndus	stry 🗸 Urban	
Succession: 🗌 Young 🔽	Old		Harde	ened 🔽 Dirt G	rime
Spray Islands S	coured		Conta	aminated 🗌 L	andfill
Snag: Removed M	odified		BMPs:	Construction	N 🗸 Sediment
Leveed: One sided	Both banks		🗌 Logg	ing 🗌 Irrigatio	n 🗌 Cooling
Relocated Cutoffs			Erosion	Bank	Surface
Bedload: 🖌 Moving	Stable		False	bank 🗌 Manı	ure 🗌 Lagoon

Relocated Bedload: 🖌 Moving

Armoured Slumped ☐ Impounded ☐ Desiccated Flood control Drainage

Stream S6S008j - facing downsteam

Stream S6S008j - facing upstream
Sample # blo3ample # Stream Name Location Surveyor Sample Date County Macro Sample Type Complete Complete Complete Complete Complete Cathers Complete Comp	IDEM		OWQ Bio	ological St	udies QHE	El (Qualitat	tive Habita	at Evaluat	ion Index)	
Augurds in the second set of the second set		Sample #		bioSample #	Stro Sa	eam Name		Locatio	n	
Include Include Include Complete Check ONE <		Surveyor	Sample Date	County	Macro	Sample Type	a 🗆 Hab	itat	_	
1) SUBSTRATE Check ONLY Two predominant substrate TYPE BOXES: Deck ONE (Or 2 and average) Check ONE (Or 2 and average) PESDIT YPES OTHER TYPES PREDUMENT OTHER TYPES PREDUMENT Check ONE (Or 2 and average) PRESULT TOTAL IS PREDUMENT PRESULT TOTAL IS PREDUMENT DEST TYPES ORIGIN QUALITY PRESULT TOTAL IS PREDUMENT PRESULT TOTAL IS PREDUMENT DEST TYPES Substrate Substrate ORIGIN QUALITY PRESULT TOTAL IS PREDUMENT PRESULT TOTAL IS PREDUMENT DEST TYPES Substrate Substrate<		jk lo	10/28/2015	Morgan	N/A	oumpic ryp	Comple		El Score:	45.5
BEST TYPES OTHER TYPES OTHER TYPES OTHER TYPES ORIGIN OULITY P CRUMINAT PERSINT TOTALS	1] SUI	BSTRATE	Check ONLY Two estimate %	predominant so and check eve	ubstrate TYPE ery type preser	BOXES; nt	Chec	k ONE (Or 2 a	nd average)	
NUMBER OF BEST TYPES: 4 or monit [2] studge from point-sources) COAL FIRES [2] NONE [1] 20 20 INSTREAM Comments COMMENTS [2] NONE [1] 20 21 INSTREAM Indicate presence 0 to 3 and estiante percent: 0-Absent: 1-Very small amounts or if more common of marginal mounts of highest quality: 3- Highest AMOUNT 1011111111111111111111111111111111111		BEST TYF ANT LDR/SLABS [1 OULDERS [9] OBBLE [8] RAVEL [7] AND [6] EDROCK [5]		PREDOMINANT PREDOMINANT PREDOMINANT PREDOMINANT HARDI DETRI MUCK SILT [2 ARTIFI	HER TYPE PRI PAN [4] [FUS [3] [[2] [] [CIAL [0] [S SENT TOTAL % R 20 20 10 10 10 10 10 10 10 10 10 1	ORIG LIMESTOI ✓ TILLS [1] ✓ HARDPAN SANDSTC RIP/RAP [LACSTRIM SHALF [-1]	IN VE [1] DS [0] V [0] VNE [0] VE [0] VE [0] 1	QUALITY HEAVY [-2] MODERATE [-1 NORMAL [0] FREE [1] EXTENSIVE [-2 MODERATE [-1 NORMAL [0]	Substrate
2] INSTREAM COVER Indicate presence 0 to 3 and estimate percent: 0-Absent; 1- Very small amounts of ingrest quality; 3- Highest quality; 3- Mighest quality; 3-	NUMBER	R OF BEST T	YPES:4 or mo ✓ 3 or les	s [0] sludg	je from point-s	ources)		ES [-2]	NONE [1]	20
2) INSTREAM COVER Indicate presence to to 3 and estimate precent: 0-Absert; 1- Very small amounts of imore common of marginal anounts of inforest quality of indiperts quality. 3- Mighest quality, 3-	Comme	ents								
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 and average) SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY HIGH [4] EXCELLENT [7] NONE [6] MODERATE [2] Channel LOW [2] FAR [3] RECOVERD [4] MODERATE [2] Channel MODERATE [3] GOOD [5] RECOVERD [4] MODERATE [2] Channel MODERATE [2] FAR [3] RECOVERD [4] MODERATE [2] Channel MODERATE [2] MODERATE [2] MODERATE [2] Channel 5.0 River right looking downateva I R RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) CONSERVATION TILLAGE [1] River right looking downateva I R RIPARIAN WIDTH I R FLOOD PLAIN QUALITY I R CONSERVATION TILLAGE [1] MODERATE [2] MODERATE [2] MODERATE [2] Riparian Riparian MODERATE [2] MODERATE [2] Recreation Pointial Riparian MODERATE [2] VERY NARROW [1] CONSERVATION TILLAGE [1] Indicate predominant land use(s) MODERATE [2] MODERATE [2] Riparian Riparian Riaximum	2] <i>INS</i> quality; 2 quality in that is st % Amoun <u>10</u> <u>1</u> <u>15</u> <u>1</u> <u>15</u> <u>1</u> Comme	TREAM CO 2-Moderate an a moderate or able, well devo t UNDERCUT E OVERHANGII SHALLOWS (ROOTMATS [VER Indicate pr nounts, but not of f greater amounts (eloped root wad in BANKS [1] NG VEGETATION [(IN SLOW WATER) [1]	resence 0 to 3 a nighest quality of e.g., very large deep/fast wate % Amount P 1] P 1] R	nd estiamte p r in small amc boulders in de r, or deep, wel OOLS>70CM [2 OOTWADS [1] OULDERS [1]	ercent: 0-Abse punts of highest ep or fast water II-defined, funct % Amount 2] 0 _101 A _11 L0	nt; 1- Very sm : quality; 3- Hig r, large diamet inoal pools.) XBOWS, BACH QUATIC MACR OGS OR WOOI	all amounts or hest er log (WATERS [1] OPHYTES [1] OY DEBRIS [1]	if more common AMO Check One (Or 2 ■ EXTENSIVE ✓ MODERATE ■ SPARSE -<2! ■ NEARLY AB: Cc Maxin	of marginal UNT and average) >75% [11] 25-75% [7] 5% [3] 5ENT <5% [1] over 20 12.0
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY HIGH (4) HIGH (4) EXCELLENT (7) NONE (6) MODERATE [3] GOOD [1] RECOVERED [4) MODERATE [2] Channel MODERATE [3] FAIR [3] RECOVERED [4] MODERATE [2] MoDERATE [2] MODERATE [3] POOR [1] RECOVERD [3] MODERATE [2] Channel 4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) Fiver right looking downstrea R RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L CONSERVATION TILLAGE [1] MODERATE [2] MODERATE [2] MODERATE [2] MODERATE [2] MODERATE [2] Reconstruction [0] MODERATE [2] MODERATE [2] MODERATE [2] Reconstruction [0] Indicate predominant land use(s) MODERATE [2] MODERATE [2] MODERATE [2] Reconstruction [0] Reconstruction [0] MODERATE [2] MODERATE [2] MODERATE [2] Reconstruction [0] Reconstruction [0] MODERATE [2] MODERATE [2] MODERATE [2] Reconstruction [0] Reconstruction [0] MODERATE [2] <td>31 CH/</td> <td>ANNEL MOI</td> <td>RPHOLOGY Ch</td> <td>eck ONE in eac</td> <td>h category (O</td> <td>r 2 and average</td> <td>e)</td> <td></td> <td></td> <td></td>	31 CH/	ANNEL MOI	RPHOLOGY Ch	eck ONE in eac	h category (O	r 2 and average	e)			
4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank and average) River right looking downstrea L R RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L R L R EROSION WIDE >50m [4] POREST, SWAMP [3] CONSERVATION TILLAGE [1] MODERATE [2] WIDE >50m [2] SCRUB OR OLD FIELD [2] MINING/CONSTRUCTION [0] MODERATE [2] VERY NARROW [1] SCRUB OR OLD FIELD [2] MINING/CONSTRUCTION [0] HEAVY/SEVERE [1] VERY NARROW [1] RESIDENTIAL, PRK, NEW FIELD [1] MINING/CONSTRUCTION [0] Comments FINCED PASTURE [1] Indicate predominant land use(s) Riparian MAXIMUM DEPTH CHANNEL WIDTH CURRENT VELOCITY Recreation Potential Check ONE (ONLY! POOL WIDTH > RIFFLE WIDTH [2] OREN FAST [1] INTERMITTENT [-2] Primary Contact 0.4. < 0.7m [2]	SINUC HIGH MODI LOW NONE	(4) ERATE [3] [2] Ents	DEVELOF EXCELLE GOOD [5] FAIR [3] ✓ POOR [1]	PMENT INT [7]	CHANNE NONE [6 RECOVE RECOVE ✓ RECENT	ELIZATION b] ERED [4] ERING [3] T OR NO RECOV) Very [1]	STABILIT HIGH [3] ✓ MODERAT LOW [1]	f TE [2] Char Maxin	nel num 20 5.0
River right looking downstrea L R RIPARIAN WIDTH L R FLOOD PLAIN QUALITY L R Montecharting 1 WIDE - Softm [4] WIDE - Softm [2] Indicate predominant land use(s) Riparian MAXIMUM DEPTH CHANNEL WIDTH CHANNEL WIDTH Check All that apply Indicate predominant land use(s) Riparian > 1 m [6] O.71m [4] POOL WIDTH - RIFFLE WIDTH [2] TORRENTIAL [-1] INTERMITTENT [-2] Primary Contact > 0.2 - 0.4m [1] POOL WIDTH - RIFFLE WIDTH [2] TORRENTIAL [1] INTERMITTENT [-2] Pool Pool WIDT - Softm [2] MIDE - Softm [2] MIDE - Softm [2] MIDE - Softm [2] Pool WIDT - Softm [2] Indicate for reach - pools and riffles Secondary Contact Pool Maximum Softm [2] Mintimum Softm [2] <td< td=""><td>4] BAI</td><td>NK EROSIO</td><td>N AND RIPARIA</td><td>AN ZONE Ch</td><td>eck ONE in e</td><td>ach category fo</td><td>r EACH BANK</td><td>(Or 2 per ban</td><td>k and average)</td><td></td></td<>	4] BAI	NK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in e	ach category fo	r EACH BANK	(Or 2 per ban	k and average)	
5] POOL/GLIDE AND RIFFLE /RUN QUALITY Maximum DEPTH Check ONE (ONLY! CHANNEL WIDTH Check ONE (Or 2 and average) CURRENT VELOCITY Check All that apply Recreation Potential (Circle one and comment on back primary Contact 0.7 - <1m [4]	River ri	ght looking downs EROSION DNE/LITTLE [3 ODERATE [2] EAVY/SEVERE Ents	trea L R RIPA N WIDE MODE B] NARR E [1] ✔ VERY	ARIAN WIDT >50m [4] :RATE 10-50m [OW 5-10m [2] NARROW [1] [0]	H L R FI FO SC FC FC FC FC FC FC FC FC FC F	LOOD PLAI REST, SWAMP RUB OR OLD F SIDENTIAL, PR NCED PASTUR PEN PASURE, R	N QUALITY [3] IIELD [2] IK, NEW FIELD E [1] OWCROP [0]	L R [1] Undicate prede past 100m rip	CONSERVATION JRBAN OR INDUS /IINING/CONSTRU /IINING/CONSTRU /IINING/CONSTRU /IINING/CONSTRUCT /IINING/	TILLAGE [1] STRIAL [0] JCTION [0] s) rian 10 4.0
MAXIMUM DEPTH Check ONE (ONLY! CHANNEL WIDTH Check ONE (Or 2 and average) CURRENT VELOCITY Check All that apply Recreation Potential (Circle one and comment on bac Circle one and comment on bac Circle one and comment on bac 1 n [6] 0.7 - <1m [4] 0.4 - <0.7m [2] 0.2 - <0.4m [1] <0.2m [0]	5] <i>PO</i> (OL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Decreation	Dotontial
Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check One (Or 2 and average) NO RIFFLE [METRIC=0] RIFFLE DEPTH BEST AREAS>10cm [2] MAXIMUM >50cm [2] STABLE (e.g., Cobble, Boulder) [2] NONE [2] BEST AREAS 5-10cm [1] MAXIMUM >50cm [1] MAXIMUM >50cm [1] STABLE (e.g., Large Gravel) [1] NONE [2] MOD. STABLE (e.g., Fine Frvel, Sand) [0] MODERATE [0] Riffle/ MAXIMUM > 0 Comments VERY LOW -1 OW [2 - 4] % POOL : 60 % CLUDE: 10	MAXIN Check O ○ >1 m 0.7 - ~ ✓ 0.4 - ~ 0.2 - ~ <0.2n Comme	1UM DEPT NE (ONLY! [6] <1m [4] <0.7m [2] <0.4m [1] 1 [0] ents	H CHAN Check ON POOL WI POOL WI POOL WI	NEL WIDTH IE (Or 2 and av DTH > RIFFLE V DTH = RIFFLE V DTH < RIFFLE V	erage) VIDTH [2] VIDTH [1] VIDTH [0]	CUR C TORRENTI/ VERY FAST FAST [1] MODERATE	RENT VEL(heck All that a AL [-1] [1] [1] [1] [1] [1] [1] [1] [1]	DCITY pply SLOW [1] INTERSTITIAL INTERMITTEN EDDIES [1] ch - pools and i	(Circle one and co (Circle one and co Primary [-1] Seconda [-2] P Curr iffles Maxin	contact ary Contact off rent 12 5.0
of riffle-obligate species: Check One (Or 2 and average) NO RIFFLE [METRIC=0] RIFFLE DEPTH RUN DEPTH RIFFLE/RUN SUBSTRATE RIFFLE/RUN EMBEDDEDNES BEST AREAS >10cm [2] MAXIMUM >50cm [2] STABLE (e.g., Cobble, Boulder) [2] NONE [2] MOD. STABLE (e.g., Large Gravel) [1] MODERATE [0] Riffle/ MODERATE [0] Riffle/ Maximum Comments VERY LOW -1 OW [2 - 4] % POOL • 60 % CLUDE • 10	Indicat	e for functiona	l riffles; Best area	s must be large	enough to sup	oport a populati	on			
	of riffle RIFFLI BEST BEST Comme	-obligate spec E DEPTH AREAS>10cn AREAS 5-10c AREAS 5-10c AREAS <5cm [metr	RUN DE RUN DE n [2] ☐ MAXIM m [1] ✔ MAXIM ic=0]	E PTH IUM >50cm [2] IUM<50cm [1]	Check Or RIFFLE/I STABLE MOD. ST UNSTAE	ne (Or 2 and av RUN SUBST (e.g., Cobble, F FABLE (e.g, Lar BLE (e.g., Fine F	erage) F RATE Boulder) [2] ge Gravel) [1] Trvel, Sand) [0]	RIFFLE/RU NONE LOW [MODE V EXTEN] <u>NO RIFFLE [ME</u> I N EMBEDDE [2]] RATE [0] [SIVE [-1] Maxin	TRIC=0] DNES ffle/ Run 8 1.0
	61 GRA	DIENT (6.3 f	īt/mi)	VERYIOW	- LOW [2 - 4]	% POOL ·	60 %		10	
DRAINAGE AREA (1.66 sq. mi.) MODERATE [6 - 10] % RUN: 10 % RIFFLE: 20 Gradient Maximum 10	DRA	INAGE ARE	A (1.66 sq. mi.)	MODERATE	[6 - 10] / HIGH [10 - 6]	% RUN:	10 %		20 Grad	ient num 10.0

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)



A-CANOPY

Comment

✓ >85% - Open	Looking upstream	(>10m, 3 readi	ngs, <10m reading in mi	idale); Round to the	nearest whole percent
55% -<85%		Left	Middle	Right	Total Average
30%-<55%	% open	%	%	%	%
10%-<30%	· <u> </u>				
<10% - Closed					
B-AESTHETICS			<u>C-REC</u>	REATION	
Nuisance algae	Oil sheen		Area	Depth	
🖌 Invasive macrophytes 🛛 🖌	Trash/Litter		Pool:	t ² □ > 3ft	
Excess turbidity	Nuisance odd	or			
Discoloration	Sludge depos	sits			
✓ Foam/Scum	CSOs/SSOs/0	Dutfalls			
D-MAINTENANCE			<u>E-ISSU</u>	<u>JES</u>	
Public 🗸 Private			WWT	P CSO	NPDES
Active Historic			lndus	stry 🔽 Urban	
Succession: 🗌 Young 🗌	Old		Harde	ened 🖌 Dirt G	irime
🗌 Spray 🔲 Islands 🔲 Sc	oured		Conta	aminated 🗌 I	_andfill
Snag: 🗌 Removed 🗌 Mo	dified		BMPs:	Construction	n 🗸 Sediment
Leveed: One sided	Both banks		🗌 Logg	ing 🗌 Irrigatio	n 🗌 Cooling
Relocated Cutoffs			Erosion	: 🗸 Bank 🗌	Surface
Bedload: Moving	Stable		False	bank 🗌 Man	ure 🗌 Lagoon
Armoured Slumped			Wash	n H2O 🔄 Tile	H2O table
🗌 Impounded 📃 Desiccate	d		Mine:	Acid Qua	arry
Flood control	ge		Flow:	Natural S	tagnant
			Wetla	and 🗌 Park 🗌	Issues: Golf
			Lawn	h Home	

Stream Drawing:





Stream S6S008I - facing downstream



Stream S6S008I - facing upstream

IDEM		OWQ Bio	ological Stu	idies QHE	l (Qualitat	ive Habitat	t Evaluatio	n Index)	
	Sample #		bioSample #	Stre Sarl	am Name		Location		
1	Surveyor	Sample Date	County	Macro 9	amnlo Tyno	- Habit	at	_	
	jk lo	10/28/2015	Morgan	N/A	ample Type	Complete	" QHEI	Score:	32
1] SL	IBSTRATE	Check ONLY Two estimate %	predominant su and check eve	bstrate TYPE E ry type present	BOXES;	Check	ONE (Or 2 and	average)	
	BEST TYF NANT BLDR/SLABS [1 BOULDERS [9] COBBLE [8]	PES PRESENT TOTAL % P R IO] P R D D D D D D D D D		HER TYPES PRES P AN [4] US [3] 2]	R R	ORIGIN LIMESTONE ✓ TILLS [1] WETLANDS HARDPAN [↓ [1]	QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1]	Substrate
	GRAVEL [7] Sand [6] Bedrock [5]					Sandston Rip/Rap [0] Lacstrine	E [0]	Extensive [-2] Moderate [-1]	0.0
NUMBE	R OF BEST T	YPES: 4 or mo 3 or les	s [0] (Scor s [0] sludg	e natural subst e from point-so	rates;ignore urces)	Shale [-1] Coal Fine:	S [-2]	NORMAL [0] NONE [1]	Maximum 20
Comm	ents								
2] ///3 quality; quality; that is s % Amou 	STREAM CO 2-Moderate an n moderate or itable, well dev int UNDERCUT I OVERHANGI SHALLOWS ROOTMATS	VER Indicate pr nounts, but not of f greater amounts (eloped root wad in BANKS [1] NG VEGETATION [(IN SLOW WATER) [1]	esence 0 to 3 a ighest quality o s.g., very large b deep/fast water % Amount P(1] P([1] B(nd estiamte per r in small amou oulders in dee , or deep, well- DOLS>70CM [2] DOTWADS [1] DULDERS [1]	rcent: 0-Abser nts of highest p or fast water, defined, functii % Amount 0X 0X 0X	nt; 1- Very smal quality; 3- High large diameter noal pools.) BOWS, BACKV UATIC MACRO GS OR WOODY	I amounts or if i est · log C VATERS [1] / PHYTES [1] / DEBRIS [1]	More common c AMOU heck One (Or 2 a EXTENSIVE > MODERATE 2 SPARSE -<25° NEARLY ABS Cov Maximu	of marginal JNT and average) -75% [11] 5-75% [7] % [3] ENT <5% [1] /er _um _20 6.0
31 CH	IANNEL MOI	RPHOLOGY Ch	eck ONE in each	n category (Or :	2 and average)			
SINU(HIGI MOE LOW NON	DSITY + [4] DERATE [3] / [2] IE [1] wents	DEVELOF EXCELLE GOOD [5] FAIR [3] ✓ POOR [1]	P MENT NT [7]	CHANNE NONE [6] RECOVER RECOVER RECOVER	LIZATION RED [4] RING [3] OR NO RECOV	ERY [1]	STABILITY HIGH [3] MODERATE LOW [1]	[2] Chanı Maximi	nel um 20 5.0
4] BA	NK EROSIO	N AND RIPARIA	AN ZONE Ch	eck ONE in ea	ch category for	EACH BANK (Or 2 per bank a	and average)	
River	right looking downs EROSION IONE/LITTLE [3 IODERATE [2] IEAVY/SEVERE	L R RIPA N WIDE MODE N NARR [1] V VCRY	RIAN WIDT >50m [4] RATE 10-50m [3 OW 5-10m [2] NARROW [1] [0]	H L R FL FOR SCR RES FEN OPE	OOD PLAIN Rest, Swamp Rub or old Fi Jidential, Pri Iced Pasture In Pasure, Ro	I QUALITY [3] ELD [2] 5, NEW FIELD [5 [1] Ir DWCROP [0] P	L R D CO UR 1] D MIN ndicate predom ast 100m ripari	NSERVATION T BAN OR INDUS IING/CONSTRU inant land use(s ^{an} Ripari Maximu	ILLAGE [1] IRIAL [0] CTION [0] an Jm 10
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MAXII Check () >1 m 0.7 - ✓ 0.4 - 0.2 - (0.2 Comm	MUM DEPT DNE (ONLY! <1m [4] <0.7m [2] <0.4m [1] m [0] teents	H CHAN Check ON POOL WI ✓ POOL WI POOL WI	NEL WIDTH IE (Or 2 and ave DTH > RIFFLE W DTH = RIFFLE W DTH < RIFFLE W	arage) IDTH [2] IDTH [1] IDTH [0]	CURF Ch TORRENTIA VERY FAST FAST [1] MODERATE	RENT VELO leck All that app L [-1] SI [1] IN [1] IN [1] El Jicate for reach	CITY bly LOW [1] ITERSTITIAL [-1 ITERMITTENT [- DDIES [1] - pools and riffl	(Circle one and cor Primary C] Secondar 2] Po Curre es Maximi	contact y Contact ol/ ent 12 4.0
Indica	te for functiona	al riffles; Best area	s must be large	enough to supp	oort a populatio	n			
of riffle RIFFL ■ BES ■ BES Comm	e-obligate spec E DEPTH T AREAS>10cr T AREAS 5-10cr T AREAS 5-10cr T AREAS <5cm [metr tents	ries: RUN DE n [2] □ MAXIM rm [1] ☑ MAXIM n ric=0]	E PTH UM >50cm [2] UM<50cm [1]	Check One RIFFLE/R STABLE (MOD. STA UNSTABL	e (Or 2 and ave UN SUBST (e.g., Cobble, B ABLE (e.g, Larg LE (e.g., Fine Fi	rage) RATE R oulder) [2] je Gravel) [1] rvel, Sand) [0]	LIFFLE/RUN NONE [2] LOW [1] MODERA ✓ EXTENSI	IO RIFFLE [MET EMBEDDE EMBEDDE EMBEDDE RIF TE [0] R VE [-1] Maximi	RIC=0] DNES
		ft/mi)				85 0/ 4			
oj GRA DRA	NINAGE ARE	ivmi) A (1.66 sq. mi.)	VERY LOW - MODERATE HIGH - VERY	LOW [2 - 4] [6 - 10] HIGH [10 - 6]	% POOL: % RUN:	<u> </u>	IFFLE: 5	Gradie Maximi	ent um 10 10.0

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)



Stream Drawing:



Stream S6S008o - facing downstream



Stream S6S008o - facing upstream

Stream S6S009



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name: UNT 1 Sartor Ditch Quadrangle	: Martinsville
Basin:Indian Creek - Sand CreekCounty:	Morgan
14-digit HUC: 05120201170070 Township :	T11N
Drainage area: 0.005 sq. mi. Range:	R1E
Legal Drain: No Section:	9
IDEM 303(d) Listed: No Quarter:	NE
USACE Jurisdiction Yes Latitude:	39.406962
IDEM Jurisdiction: Yes Longitude:	-86.423479

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S009a	Ephemeral	Roadside Ditch	4.57	0.63	HHEI = 26	296	0.03	0.00
S6S009b	Ephemeral	Culvert	4.60	0.10	N/A	34	<0.01	0.00
S6S009c	Ephemeral	Roadside Ditch	4.60	0.10	HHEI = 16	64	0.01	0.00
Total	-			•	-	394	0.04	0.00

* Includes both permanent and temporary impacts

Approximately 394 feet (0.042 acre) of the roadside channel UNT 1 to Sartor Ditch will be relocated. The OHWM of the UNT 1 to Sartor Ditch averages 4.6 wide by 0.1 to 0.6 feet deep. Currently, 45 feet (0.006 acres) of the stream are encapsulated. The relocated channel will be 220 feet (0.002 acre) in length including 19 linear feet (0.002 acre) of revetment riprap, and 201 (0.021 acre) of open natural channel. The relocation of UNT 1 to Sartor Ditch will result in the loss of 174 feet of channel. The channel will be moved from the west side of the existing Mahalasville Road/Southview Drive. The new channel will originate from the outlet of a new encapsulated storm sewer system.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. A total of 201 feet of impacts to this stream are being considered restored on-site and 193 feet of mitigation is being offered for the loss of stream length and riprap scour protection area.

Primary Headwater Habitat Evaluation Form

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

26

SITE NAME/LOCATION UNT 1 Sartor Ditch	h	
SITE NUMBER SE	6S009a RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.005
LENGTH OF STEAM REACH (ft)	LAT 39.406962 LONG86.423479 RIVER CODE N/A RIVER MILE	N/A
DATE 10/27/2015 SCORER ry	COMMENT	
NOTE: Complete All Items On This Form	- Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL NONE / NATUR MODIFICATIONS:	AL CHANNEL 🗌 RECOVERED 📄 RECOVERING 🔽 RECENT OR NO RE	COVERY
1. SUBSTRATE (Estimate percent of eve (Max of 32). Add total number of signific	ery type of substrate presentCheck ONLY two predominant substrate TYPE boxes cant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	HHEI Metric
	ERCENT TYPE PERCENT	Points
□ □	0 SIL [3 pt] 40 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 0 FINE DETRITUS [3 pts] 0 0 CLAY or HARDPAN [0 pts] 0 0 MUCK [0 pts] 0 60 ARTIFICIAL [3 pts] 0	Substrate Max = 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SU	JBSTRATE TYPES 9 TOTAL NUMBER OF SUBSTRATE TYPES 2	
2. MAXIMUM POOL DEPTH (Measure the evaluation. Avoid plunge pools from response of the evaluation.	he maximum pool depth within the 61 meter (200 ft)evaluation reach at the time of oad culverts or storm water pipes)	Pool Depti Max = 30
 >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] 	0
	MAXIMUM POOL DEPTH (centimeters): 0	
Source Second Provided Address 3. BANK FULL WIDTH (Measured Address) 3.0 >4.0 3.0 m - 4.0 >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3")	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured at the second se	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured at a structure) > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured at a stress (>13') [30 pts] > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 15
COMMENTS: 3. BANK FULL WIDTH (Measured and a construction of the second of the s	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") >15 pts] <=1.0m (<=3'3")	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured at a stress (>13') [30 pts] > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box):	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured at a stress (>13') [30 pts] > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R Wide >10 m Moderate 5-10 m Narrow <5 m	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box):	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured at a strength of the streng strength of the strengt of the strength of	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 15

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DOWNSTREAM DESIGNATED USE(S) Distance fro WWH Name: Sator Ditch Distance fro CWH Name: Distance fro EWH Name: Distance fro Distance fro MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY M JSGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRC County: Morgan Township / City: Washington Master Clearly M Sase flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quai Photograph information:	QHEI form)
WWH Name: Sartor Ditch Distance fro CWH Name: Distance fro EWH Name: Distance fro Distance fro MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY M JSGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRC County: Morgan Township / City: Washington Mashington Base flow conditions? No Date of last precipitation: 10/27/2015 Qua Photograph information:	
CWH Name: Distance fro EWH Name: Distance fro Distance fro MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY M JSGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRC County: Morgan Township / City: Washington Mashington Miscellaneous Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quai Photograph information:	Evaluated Stream
	Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY M JSGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRC County: Morgan Township / City: Washington MRCS Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Qual Photograph information:	Evaluated Stream
USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCC County: Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quar Photograph information:	RK THE SITE LOCATION
County: Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Qua Photograph information:	Soil Map Stream Order:
MISCELLANEOUS Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Qua Photograph information:	
Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Qua Photograph information:	
Date of last precipitation:	ity 0.93
Elevated Turbidity? (Y/N)No Canopy (% open):100 Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach resu Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductions is the sampling reach representative of the stream? (Y/N) Yes 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 sa ID number. Include apropriate field data sheets from the Primary Headwater Habit Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? Comments Regarding Biology:	
Elevated Turbidity? (Y/N) No Canopy (% open): 100 Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach resu Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conduct s the sampling reach representative of the stream? (Y/N) Yes 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 sa ID number. Include apropriate field data sheets from the Primary Headwater Habit Fish observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? Conduct? (Y/N) Comments Regarding Biology:	
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Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conduct is the sampling reach representative of the stream? (Y/N) Yes If not, please explain: Additional comments/description of pollution impacts:	s) Lab number: N/A
s the sampling reach representative of the stream? (Y/N) Yes 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 sa ID number. Include apropriate field data sheets from the Primary Headwater Habit Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N) Voucher Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? Comments Regarding Biology:	ty (umhos/cm):
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Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? Comments Regarding Biology:	er? (Y/N)
Comments Regarding Biology:	Y/N) Voucher? (Y/N)

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Stream S6S009a - facing upstream



Stream S6S009a - facing downstream

ChieFPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	6
SITE NAME/LOCATION UNT 1 Sartor Ditch	
SITE NUMBER S6S009c RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.005
LENGTH OF STEAM REACH (ft) LAT 39.407413 LONG86.423518 RIVER CODE N/A RIVER MILE N/	/A
DATE 10/26/2015 SCORER ry COMMENT	
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 RECO MODIFICATIONS:	VERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes	
(Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	Metric
TYPE PERCENT TYPE PERCENT Image: Bit DR SLARS [16 ptc] 0 Image: Slars [16 ptc] 0	Points
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Substrate
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Max = 40
GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0 SAND (<2 mm) [6 pts]	1
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	(A+B)
Bldr Slabs, Boulder, Cobble, Bedrock	、
2 MAXIMUM POOL DEPTH (Measure the maximum pool depth within the 64 meter (200 fb)valuation reach at the time of	Bool Dopth
evaluation. Avoid plunge pools from road culverts or storm water pipes)	Max = 30
 > >30 centimeters [20 pts] > >5 cm - 10 cm [15 pts] > 22.5 - 30 cm [30 pts] < 5 cm [5 pts] 	
Solution → 10 - 22.5 cm [25 pts] ✓ No Water or Moist Channel [0 pts]	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.0 m - 1.5m (>3'3" - 4'8") [15 pts]	Width Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.4	15
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River left (L) and Right (R) as looking downstream	
<u>RIPARIAN WIDTH</u> <u>FLOODPLAIN QUALITY</u>	
Wide >10 m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10 m Immature Forest, Shrub or Old Field Viban or Industrial	
✓ None ✓ Fenced Pasture ✓ ✓ Mining or Construction	
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
 Steam 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)	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
STREAM GRADIENT ESTIMATE	ft)
	••)

ADDITIONAL STREAM INF	ORMATION (This inf	ormation must also	be complete		
QHEI PERFORMED	🗌 Yes 🖌 No	QHEI Score:	(If yes, attach co	mpleted QHEI form)	
DOWNSTREAM DES	IGNATED USE(S)				
WWH Name: Sartor Dite	:h		Distar	nce from Evaluated St	ream
CWH Name:			Distar	nce from Evaluated St	ream
				ice from Evaluated St	ream
MAPPING: ATTACH	COPIES OF MAPS, INCLU	IDING THE ENTIRE WATE	RSHED AREA. CLEA	ARLY MARK THE SITE L	OCATION
USGS Quadrangle Name: Mart	insville	NRCS Soil I	Map Page: 48	NRCS Soil Map Stre	eam Order: 0
County: Morgan		Township / City: Wa	shington		
MISCELLANEOUS	3				
Base flow conditions? (Y/N)	No Date of last pr	recipitation: 10/24/2015	1	Quantity 0.28	
Photograph information:					
Elevated Turbidity? (Y/N)	o Canopy (% o	pen): 100			
Were samples collected for wate	r chemistry? (Y/N)	No (Note lab sample	e no. or id. and attac	h results) Lab number	n: N/A
Field Measures: Temp (C)	Dissolved oxy	rgen (mg/l):	pH: Co	onductivity (umhos/cm):
Is the sampling reach represent	ative of the stream? (Y/N	I) Yes If not, pleas	se explain:		
Additional comments/description	of pollution impacts:				
Comments Regarding Biology:					
DRAWING AME Include important landm) NARRATIVE DESCRIF arks and other features of in	PTION OF STREAM RE	ACH (This <u>must</u> b nd a narrative descripti	e completed): ion of the stream's location	n
1 Sta	4		Andry	k Ray	NT
E son	nthuren T	Drive H -		Mahalusull	
		K	1 11	1	



Stream S6S009c - facing downstream



Stream S6S009c - facing upstream

Stream S6S010



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 2 Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.01 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	9
IDEM 303(d) Listed:	No	Quarter:	NE
USACE Jurisdiction	Yes	Latitude:	39.408978
IDEM Jurisdiction:	Yes	Longitude:	-86.421911

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S010a	Ephemeral	Roadside Ditch	3.00	0.85	HHEI = 17	502	0.03	0.00
S6S010b	Ephemeral	Roadside Ditch	2.67	0.47	HHEI = 17	808	0.05	0.00
S6S010c	Ephemeral	Culvert	3.13	0.27	N/A	80	0.01	0.00
S6S010d	Ephemeral	Roadside Ditch	3.13	0.27	HHEI = 17	134	0.01	0.00
Total						1524	0.10	0.00

* Includes both permanent and temporary impacts

Approximately 1,529 feet (0.105 acre) of the UNT 2 to Sartor Ditch will be relocated into a proposed new relocated channel. Of this channel length 1,444 is open roadside channel and 80 feet is existing encapsulation. The OHWM of the UNT 2 to Sartor Ditch ranges from 2.7 to 3.1 feet wide by 0.3 to 0.9 feet deep. The proposed new relocated channel will consist of 914 feet (0.063 acre) of open natural bottom channel which is broken into two segments. One segment is 390 feet in length and is located north of the relocated Sartor Ditch and one segment is 524 linear feet and is south of the Sartor Ditch. The relocation of this channel will result in the loss of 610 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. A total of 914 feet of the impacts to this stream area are being considered restored on-site and 540 feet of mitigation is being offered for the loss in stream length.

OhieEPA	Primary Head	vater Ha н	ibitat Evaluatioi IHEl Score (sum of n	n Form netrics 1, 2, 3)	17
SITE NAME/LOCATION LENGTH OF STEAM RE/ DATE <u>10/28/2015</u> S NOTE: Complete All Ite	UNT 2 Sartor Ditch SITE NUMBER S6S010a ACH (ft) LAT 39.4 SCORER ry CO ems On This Form - Refer to ""F	RIVER BASIN 08978 LONG. MMENT ield Evaluation	Indian Creek - Sand Cree C -86.421911 RIVER CODE	DRAINAGE AREA (mi) N/A RIVER MILE reams" for Instructions	0.01 N/A
MODIFICATIONS: 1. SUBSTRATE (Esti (Max of 32). Add to	mate percent of every type of su tal number of significant subsrate <u>PERCENT</u>	bstrate present types found (Ma	Check ONLY two predominan x of 8). Final metric score is s	t substrate TYPE boxes sum of boxes A and B.) <u>PERCENT</u>	HHEI Metric Points
BLDR SLABS [BOULDER (>29 BEDROCK [16 COBBLE (65-2 GRAVEL (2-64 SAND (<2 mm)	16 pts] 0 56 mm) [16 pts] 0 pts] 0 56 mm) [9 pts 0 mm) [9 pts] 0 i [6 pts] 0	✓ ✓ SI LE C M A	ILT [3 pt] EAF PACK/WOODY DEBRIS INE DETRITUS [3 pts] LAY or HARDPAN [0 pts] UCK [0 pts] RTIFICIAL [3 pts]	[3 pts] <u>0</u> 0 0 0 0 0	Substrate Max = 40
Total of Perce Bldr Slabs, Boulder, SCORE OF TWO MOST 2. MAXIMUM POOL	ntages of Cobble, Bedrock 0.00% PREDOMINATE SUBSTRATE TY DEPTH (Measure the maximum	(A) 'PES 6	Substrate Percentage Check 100 % TOTAL NUMBER OF SUBS nin the 61 meter (200 ft)evalue	(B) TRATE TYPES 1 ation reach at the time of	(A+B) Pool Depth

~

This information must also be completed

Immature Forest, Shrub or Old Field

✓

2.0

2.5

Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft /100 ft)

R (Most Predominant Per Bank)

Mature Forest, Wetland

Fenced Pasture

Residential, Park, New Field

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

FLOODPLAIN QUALITY

L

FLOW REGIME (At time of evaluation) (Check ONLY one box):

1.0

1.5

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

>5 cm - 10 cm [15 pts]

<=1.0m (<=3'3") [5 pts]

No Water or Moist Channel [0 pts]

>1.0 m - 1.5m (>3'3" - 4'8") [15 pts]

MAXIMUM POOL DEPTH (centimeters):

AVERAGE BANKFULL WIDTH (Meters):

NOTE: River left (L) and Right (R) as looking downstream

✓ ✓

Dry channel, no water (Ephemeral)

L R

Moist channel, isolated pools, no flow (Intermittent)

<5 cm [5 pts]

evaluation. Avoid plunge pools from road culverts or storm water pipes)

RIPARIAN ZONE AND FLOODPLAIN QUALITY

Subsurface flow with isolated pools (interstitial)

STREAM GRADIENT ESTIMATE

Max = 30

5

Bankfull

Width

Max = 30

5

0

0.9

Conservation Tillage

Open Pasture, Row Crop

Mining or Construction

Urban or Industrial

3.0

>3.0

⊻

3.

> >30 centimeters [20 pts]

> 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]

RIPARIAN WIDTH

Moderate 5-10 m

(Per Bank

Wide >10 m

Narrow <5 m

None

Comments:

Steam flowing

Comments:

None

0.5

Flat (0.5 ft/100 ft)

>22.5 - 30 cm [30 pts]

>10 - 22.5 cm [25 pts]

COMMENTS:

COMMENTS:

L R

QHEI PERFORMED Yes 🔽 No QHEI Score: (If y	es, attach completed QHEI form)
DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EVVH Name:	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED	AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Martinsville NRCS Soil Map Pa	ge: 48 NRCS Soil Map Stream Order:
County: Morgan Township / City: Washington	on
MISCELLANEOUS	
Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015	Quantity 0.93
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open): 100	
Nere samples collected for water chemistry? (Y/N) No (Note lab sample no. or	rid. and attach results) Lab number: N/A
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):
s the sampling reach representative of the stream? (Y/N) Yes If not, please expla	ain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional ID number. Include apropriate field data sheets from the Print	I. Note: all voucher samples must be labeled with the site mary 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 Macroinver	rtebrates observed? (Y/N) Voucher? (Y/N)
Commente Demendin a Diele au	

200 ed Mound Fra



Stream S6S010a - facing downstream



Stream S6S010a - facing downstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2,	3) 17
SITE NAME/LOCATION UNT 2 Sartor Ditch	
SITE NUMBER S6S010b RIVER BASIN Indian Creek - Sand Cree DRAINAGE ARE/	A (mi) 0.01
LENGTH OF STEAM REACH (ft) LAT 39.410147 LONG86.420158 RIVER CODE N/A RIVER	ER MILE N/A
DATE 10/28/2015 SCORER ry COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instr	ructions
STREAM CHANNEL _ NONE / NATURAL CHANNEL _ RECOVERED _ RECOVERING ✔ RECENT OF MODIFICATIONS:	R NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A a	boxes Ind B.) HHEI Metric
TYPE PERCENT TYPE PERCE Image: DR SLABS [16 pts] 0 Image: Question of the state of the sta	NT Points
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0	Substrate
	Max = 40
Image: Constraint of the state of	_ 7
Total of Percentages of 0.00% (A) Substrate Percentage 100 % (B) Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) Check 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 6 TOTAL NUMBER OF SUBSTRATE TYPES	1
 MAXIMUM POOL DEPTH (Measure the maximum pool depth within the 61 meter (200 ft)evaluation reach at the evaluation. Avoid plunge pools from road culverts or storm water pipes) 	e time of Pool Dept Max = 30
>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
>22.5 - 30 cm [30 pts] ✓ <5 cm [5 pts]	5
COMMENTS: MAXIMUM POOL DEPTH (centimeters):	0
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
 > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] 	Width Max = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters):	0.8 5
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River left (L) and Right (R) as looking downst	ream
RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank L R (Most Predominant Per Bank) L R	
Wide >10 m Ature Forest, Wetland Conservation Till Mature Forest. Shrub or Old Field V Urban or Industri	age al
Narrow <5 m Residential, Park, New Field Open Pasture, R	ow Crop
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
□ Steam flowing □ Moist channel, isolated pools, no flow (In □ Subsurface flow with isolated pools (interstitial) ✓ Dry channel, no water (Ephemeral) Comments: □ □ □ □	termittent)
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 >3.0	
STREAM GRADIENT ESTIMATE □ Flat (0.5 ft/100 ft) ✓ Flat to Moderate □ Moderate (2 ft/100 ft) □ Moderate to Severe □ Sever	e (10 ft /100 ft)

ADDITIONAL STREAM INFOR	RMATION (This inform	ation must also l	<u>pe complete</u>	
QHEI PERFORMED	Yes 🖌 No QHE	El Score:	(If yes, attach co	mpleted QHEI form)
DOWNSTREAM DESIG	NATED USE(S)			
WWH Name: Sartor Ditch			Dista	nce from Evaluated Stream
CWH Name:			Dista	nce from Evaluated Stream
EWH Name:			Dista	nce from Evaluated Stream
MAPPING: ATTACH CO	PIES OF MAPS, INCLUDING	THE ENTIRE WATE	RSHED AREA. CLEA	ARLY MARK THE SITE LOCATION
JSGS Quadrangle Name: Martins	sville	NRCS Soil M	ap Page: 48	NRCS Soil Map Stream Order: 2
County: Morgan	То	wnship / City: Was	hington	
MISCELLANEOUS				
Base flow conditions? (Y/N) Ye	s Date of last precipi	tation: 10/27/2015		Quantity 0.93
Photograph information:				
Elevated Turbidity? (Y/N) No	Canopy (% open)	100		
Vere samples collected for water of	 chemistry? (Y/N) No	(Note lab sample	no. or id. and attac	ch results) Lab number: N/A
Field Measures: Temp (C)	Dissolved oxygen	 (mg/l):	pH: C	onductivity (umhos/cm):
s the sampling reach representativ	/e of the stream? (Y/N)	Yes If not, please	e explain:	· · · · · ·
			·	
Additional comments/description o	f pollution impacts:			
BIOTIC EVALUATIO	N			
Performed? (Y/N) No (If Yes, record all observations D number. Include apropriate	Voucher collections of field data sheets from	optional. Note: all vou the Primary Headwat	ucher samples must be labeled with the site er Habitat Assessment Manual.)
Fish observed? (Y/N)	oucher? (Y/N) S	alamanders observe	ed? (Y/N)	Voucher? (Y/N)
Frogs or tadpoles observed? (Y/N)	Voucher? (Y/N)	Aquatic Macr	oinvertebrates obs	erved? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:				
			CH /This must k	a completed):
Include important landmark	S and other features of interests	tor site evaluation an	d a narrative descript	ion of the stream's location
morade important la lullar			a a narraive descript	





Stream S6S010b - facing downstream



Stream S6S010b - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	7
SITE NAME/LOCATION UNT 2 Sartor Ditch	
SITE NUMBER S6S010d RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.005
LENGTH OF STEAM REACH (ft) LAT 39.411019 LONG86.419046 RIVER CODE N/A RIVER MILE N	/A
DATE 10/28/2015 SCORER ry COMMENT	
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 RECO	VERY
MODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.)	HHEI
	Metric
$\square \square BLDR SLABS [16 pts] \qquad 0 \qquad \forall \forall SILT [3 pt] \qquad 100$	Points
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0	Substrate
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	7
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 6 TOTAL NUMBER OF SUBSTRATE TYPES 1	
 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) 	Pool Depth Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
>22.5 - 30 cm [30 pts] ✓ <5 cm [5 pts]	5
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	L
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <= 1.0m (<=3'3") [5 pts]	Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 0.9	5
This information m <u>ust a</u> lso 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	
Moderate 5-10 m Immature Forest, Welland Conservation Tillage Conservation Tillage	
Narrow <5 m Residential, Park, New Field Open Pasture, Row Crop	
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
 Steam flowing Subsurface flow with isolated pools (interstitial) Comments: 	
SINUOSITY (Number of bends per 61 m (200 ft) of channel. Check ONLY one box)	
▼ None 1.0 2.0 3.0	
U UU	
☐ Flat (0.5 ft/100 ft) ✓ Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft /100	ft)

	attach completed OHEL form)
WWH Name: Sartor Ditch	Distance from Evaluated Stream
	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AF	REA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Martinsville NRCS Soil Map Page:	: NRCS Soil Map Stream Order:0
County: Morgan Township / City: Washington	
Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015	Quantity 0.93
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open): 100	
Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id.	. and attach results) Lab number: N/A
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):
s the sampling reach representative of the stream? (Y/N) Yes If not, please explain:	· · · · · <u></u>
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	late: all vauabar complex must be labeled with the site
BIOTIC EVALUATION Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. No ID number. Include apropriate field data sheets from the Primar	Note: all voucher samples must be labeled with the site ry Headwater Habitat Assessment Manual.)
BIOTIC EVALUATION Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. N ID number. Include apropriate field data sheets from the Primar Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N)	Note: all voucher samples must be labeled with the site ry Headwater Habitat Assessment Manual.) Voucher? (Y/N)
BIOTIC EVALUATION Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. N ID number. Include apropriate field data sheets from the Primar Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N) Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverted	Note: all voucher samples must be labeled with the site ry Headwater Habitat Assessment Manual.) Voucher? (Y/N) prates observed? (Y/N) Voucher? (Y/N)

/ ,	1	6	M	F	Commercial
SR	31	T T T		El	
/	1 AND I	12 June Row	\mathbb{N}	F	/
1	//	Tradition	A	/	



Stream S6S010d - facing upstream

Stream S6S011



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 3 Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.532 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	3
IDEM 303(d) Listed:	No	Quarter:	SW
USACE Jurisdiction	Yes	Latitude:	39.413025
IDEM Jurisdiction:	Yes	Longitude:	-86.41773

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S011a	Intermittent	Channelized Ditch	5.33	0.83	HHEI = 63	20	<0.01	0.00
S6S011b	Intermittent	Culvert	5.33	0.83	N/A	0	0.00	0.00
S6S011c	Intermittent	Culvert	5.00	0.70	N/A	217	0.02	0.00
S6S011d	Intermittent	Channelized Ditch	5.00	0.70	HHEI = 56	187	0.02	0.00
S6S011e	Intermittent	Culvert	5.67	0.83	N/A	0	0.00	0.00
S6S011f	Intermittent	Channelized Ditch	5.67	0.83	HHEI = 51	0	0.00	0.00
S6S011g	Ephemeral	Channelized Ditch	5.33	0.23	HHEI = 31	165	0.02	0.00
Total						589	0.07	0.00

* Includes both permanent and temporary impacts

The OWHM of the UNT 3 to Sartor Ditch ranges from 5.0 to 5.3 feet wide by 0.7 to 0.8 feet deep. Impacts to the UNT 3 to Sartor Ditch include replacing the existing 217 feet long by 60-inch-wide by 40-inch-high CMP that carries the SR 37 over the UNT 3 to Sartor Ditch with a new 210 feet long 68-inch-wide by 43-inch-high CMP structure (27 cubic yards) (Structure P134). In addition to the impact for the placement of the new CMP, approximately 38 feet (0.004 acre) will be impacted for the placement of revetment riprap for scour protection. The permanent impacts to the UNT 3 to Sartor Ditch include 210 feet (0.026 acre) of previously encapsulated stream channel and 38 feet (0.002 acre) of open captured roadside drainage channel for a total impact of 248 feet.

Approximately 424 feet (0.049 acre) of the UNT 3 to Sartor Ditch is located within the existing right-of-way and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 31 feet of mitigation is being offered for impacts to this stream due to the increase in permanent impacts from 217 feet to 248 feet with the installation of the new structure and riprap scour protection.

The OWHM of the UNT 3 to Sartor Ditch averages 5.3 feet wide by 0.2 feet deep. Impacts to the UNT 3 to Sartor Ditch include installation of a new culvert for Artesian Avenue. The new culvert will be 108 feet long 30 inch reinforced concrete pipe (4 cubic yards) (Structure P504a). The permanent impacts to the UNT 3 to Sartor Ditch include 20 feet (0.002 acre) of revetment riprap and 108 feet (0.012 acre) of stream encapsulation for a total impact of 128 feet.

Note, this structure will carry UNT 3 to Sartor Ditch. At this location, the main volume of flow in this stream is from the roadside ditch and Wetland S6W137a (Wetland Impacts #10) which is downstream of this culvert outlet. There is minimal flow upstream of Wetland S6W137a. This culvert was sized to adequately convey the stormwater flows but is smaller than the average channel width.

Approximately 165 feet (0.02 acre) of the UNT 3 to Sartor Ditch is located within the existing right-of-way for Artesian Avenue and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 128 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection.

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

63

SITE NAME/LOCATION UNT 3 Sartor Ditch	
SITE NUMBER S6S011a RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.532
LENGTH OF STEAM REACH (ft) LAT 39.413021 LONG86.418094 RIVER CODE N/A RIVER MILE	N/A
DATE 10/28/2015 SCORER jk lo COMMENT	
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 REC MODIFICATIONS:	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	HHEI
<u>TYPE</u> <u>PERCENT</u> <u>TYPE</u> <u>PERCENT</u>	Points
BLDR SLABS [16 pts] 0 Image: SILT [3 pt] 0 BOULDER (>256 mm) [16 pts] 0 Image: LEAF PACK/WOODY DEBRIS [3 pts] 0 BEDROCK [16 pts] 0 Image: LEAF PACK/WOODY DEBRIS [3 pts] 0 COBBLE (65-256 mm) [9 pts] 0 Image: LEAF PACK/WOODY DEBRIS [3 pts] 0 COBBLE (65-256 mm) [9 pts] 10 Image: LEAF PACK/WOODY DEBRIS [3 pts] 0 GRAVEL (2-64 mm) [9 pts] 30 Image: LEAF PACK/WOODY DEBRIS [3 pts] 0 MUCK [0 pts] 0 Image: LEAF PACK/WOODY DEBRIS [3 pts] 0 SAND (<2 mm) [6 pts]	Substrate Max = 40 18
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10.00% (A)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 15 TOTAL NUMBER OF SUBSTRATE TYPES 3	
 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) 	Pool Dept Max = 30
> >30 centimeters [20 pts] >5 cm - 10 cm [15 pts] ✓ >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] No Water or Moist Channel [0 pts]	30
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>97" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: two 24" culverts AVERAGE BANKFULL WIDTH (Meters): 1.5 two 24" culverts AVERAGE BANKFULL WIDTH (Meters):	Bankfull Width Max = 30 15
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8") [15 pts] >1.5 m - 3.0 m (>3'3" - 4'8" - 10 m (>3'3	Bankfull Width Max = 30
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>9'7" - 4'8") [20 pts] >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] COMMENTS: two 24" culverts 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 <u>RIPARIAN WIDTH</u> FLOODPLAIN QUALITY NOTE: River left (L) and Right (R) as looking downstream Mide >10 m Mature Forest, Wetland Immature Forest, Shrub or Old Field Open Pasture, Row Crop Moderate 5-10 m Mature forest, Shrub or Old Field Open Pasture, Row Crop Open Pasture, Row Crop None Y Residential, Park, New Field Open Pasture, Row Crop Mining or Construction Comments:	Bankfull Width Max = 30
COMMENTS:	Bankfull Width Max = 30

OhigEPA

QHEI PEI	RFORMED	Yes 🖌 No	QHEI Score:	(If yes, atta	ach completed QHEI f	orm)
DOWNST	REAM DESIGN	NATED USE(S)				
WWH Name:	Sartor Ditch				Distance from Evalua	ated Stream
CWH Name:					Distance from Evalua	ated Stream
EWH Name:					Distance from Evalua	ated Stream
MAPPIN	G: АТТАСН СО	PIES OF MAPS, IN	CLUDING THE ENTIR		CLEARLY MARK THE	SITE LOCATION
USGS Quadrangle I	Name: Martins	ville	NRC	S Soil Map Page:	48 NRCS Soil M	ap Stream Order:
County: Morgan			Township / Ci ^r	ty: Washington		
MISCEL	LANEOUS					
Base flow conditions	s? (Y/N) No	Date of las	st precipitation: 10 /2	28/2015	Quantity	0.45
Photograph informa	tion:					
Elevated Turbidity?	(Y/N) No	Canopy ('	% open): 80			
Were samples colle	cted for water c	hemistry? (Y/N)	No (Note lab	o sample no. or id. and	d attach results) Lab r	number: N/A
Field Measures:	Temp (C)	Dissolved	oxygen (mg/l):	pH:	Conductivity (umł	nos/cm):
s the sampling read	ch representativ	e of the stream? (Y/N) Yes If no	ot, please explain:		
Additional comment	s/description of	pollution impacts	:			
BIOTIC	EVALUATIO	N				
Performed? (Y/N)	No (l'	f Yes, record all obs) number. Include a	ervations. Voucher co propriate field data she	ets from the Primary He	all voucher samples mu eadwater Habitat Assess	st be labeled with the site ment Manual.)
Fish observed? (Y/N	N) Vo	oucher? (Y/N)	Salamanders	s observed? (Y/N)	Voucher? (Y/	N)
Frogs or tadpoles ol	bserved? (Y/N)	Voucher	? (Y/N) Aqua	atic Macroinvertebrate	es observed? (Y/N)	Voucher? (Y/N)
					-	





Stream S6S011a - facing downstream



Stream S6S011a - facing upstream

ChieEPA Primary Headwater H	Iabitat Evaluation Form56HHEI Score (sum of metrics 1, 2, 3)
SITE NAME/LOCATION UNT 3 Sartor Ditch	
SITE NUMBER S6S011d RIVER BASI	N Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.05
LENGTH OF STEAM REACH (ft) LAT 39.413018 LON	G86.417035 RIVER CODE N/A RIVER MILE N/A
DATE 10/28/2015 SCORER jk lo COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluati	on Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECO	VERED RECOVERING V RECENT OR NO RECOVERY
MODIFICATIONS:	
 SUBSTRATE (Estimate percent of every type of substrate press (Max of 32). Add total number of significant substrate types found (entCheck ONLY two predominant substrate TYPE boxes Max of 8), Final metric score is sum of boxes A and B.)
	Metric
$\square \square BLDR SLABS [16 pts] 0 0 0$	SILT [3 pt] POINTS
BOULDER (>256 mm) [16 pts] 0	LEAF PACK/WOODY DEBRIS [3 pts] 0 Substrate
COBBLE (65-256 mm) [9 pts 0	CLAY or HARDPAN [0 pts]
	MUCK [0 pts] 0 11 ARTIFICIAL [3 pts] 0 11
Total of Percentages of 0.00% (A)	Substrate Percentage Check 100 % (B) (A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 9	TOTAL NUMBER OF SUBSTRATE TYPES 2
2. MAXIMUM POOL DEPTH (Measure the maximum pool depth v evaluation. Avoid plunge pools from road culverts or storm water	vithin the 61 meter (200 ft)evaluation reach at the time of pipes) Pool Depth Max = 30
>>30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]
>10 - 22.5 cm [25 pts]	No Water or Moist Channel [0 pts] 30
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0
3. BANK FULL WIDTH (Measured as the average of 3-4 m	easurements) (Check ONLY one box): Bankfull
	' >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Width <=1 0m (<=3'3") [5 pts] Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 1.5
This information muse RIPARIAN ZONE AND FLOODPLAIN QUALITY NO	<u>st a</u> lso be completed TE: River left (L) and Right (R) as looking downstream
RIPARIAN WIDTH FLOODPLAIN QUALITY	Y
L R (Per Bank L R (Most Predomina	ant Per Bank) L R
Wide >10 m Mature Forest, V	Netland Conservation Tillage
Moderate 5-10 m Immature Fores	t, Shrub or Old Field
✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ <	Mining or Construction
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY on	e box):
Subsurface flow with isolated pools (interstitial)	Dry channel, no water (Ephemeral)
Comments: <u>64"x41" culvert under SR37</u>	
SINUOSITY (Number of bends per 61 m (200 ft) of channel	. Check ONLY one box)
▶ None 1.0 0.5 1.5	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
STREAM GRADIENT ESTIMATE	_
☐ Flat (0.5 ft/100 ft)	/100 ft)

QHEI PERFORMED 📋 Yes 🖌 No QHEI	Score: (If yes, attach completed QHEI form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Sartor Ditch	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
JSGS Quadrangle Name: Martinsville	NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: 1
County: Morgan Tow	vnship / City: Washington
MISCELLANEOUS	
Base flow conditions? (Y/N) No Date of last precipita	ation: 10/28/2015 Quantity 0.45
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open):	90
Nere samples collected for water chemistry? (Y/N) No	(Note lab sample no. or id. and attach results) Lab number: N/A
Field Measures: Temp (C) Dissolved oxygen (n	ng/I): pH: Conductivity (umhos/cm):
s the sampling reach representative of the stream? (Y/N)	Yes If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N) No (If Yes, record all observations. ID number. Include apropriate fi	Voucher collections optional. Note: all voucher samples must be labeled with the site ield data sheets from the Primary Headwater Habitat Assessment Manual.)
Fish observed? (Y/N) Voucher? (Y/N) Sal	lamanders observed? (Y/N) Voucher? (Y/N)
	Aquatic Macroinvertebrates observed? (Y/N) Voucher? (Y/N)
-rogs or tadpoles observed? (Y/N) Voucher? (Y/N)	
-rogs or tadpoles observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology:	





Stream S6S011d - facing upstream



Stream S6S011d - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 57	1
SITE NAME/LOCATION UNT 3 Sartor Ditch	
SITE NUMBER S6S011f RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.49
LENGTH OF STEAM REACH (ft) LAT LAT LONG86.415383 RIVER CODE N/A RIVER MILE/A	A
DATE 10/28/2015 SCORER jk lo COMMENT	
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 RECOVERING RECENT OR NO RECOVERING	VERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) TYPE PERCENT TYPE PERCENT TYPE PERCENT	HHEI Metric Points
BLDR SLABS [16 pts] 0 V SLI [3 pt] 10 BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 S BEDROCK [16 pts] 0 FINE DETRITUS [3 pts] 0 I COBBLE (65-256 mm) [9 pts] 0 CLAY or HARDPAN [0 pts] 0 I GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0 0	Substrate Max = 40
SAND (<2 mm) [6 pts] 90 ARTIFICIÁL [3 pts] 0	11
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) Substrate Percentage 100 % (B) (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 9 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) 	Pool Depth Max = 30
 ✓ >>30 centimeters [20 pts] >22.5 - 30 cm [30 pts] >5 cm - 10 cm [15 pts] <5 cm [5 pts] 	20
>10 - 22.5 cm [25 pts] No Water or Moist Channel [0 pts]	20
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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m (<3'3" - 4'8") [15 pts]	Bankfull Width Max = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.7	20
This information must also be completed	
I R (Per Bank I R (Most Predominant Per Bank) I R	
Image: Section of the section of t	
FLOW REGIME (At time of evaluation) (Check ONLY one box): Steam flowing Image: Comments: Moist channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)	
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 >3.0	
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)	ft)

QHEI PER	RFORMED] Yes 🖌 No	QHEI Score:	(If yes, atta	ach completed QHEI fo	rm)		
DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch Distance						ce from Evaluated Stream		
_ CWH Name: _ EWH Name:					Distance from Evaluat Distance from Evaluat	ed Stream ed Stream		
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOC								
USGS Quadrangle I	Name: Martinsv	ille	NRC	S Soil Map Page:	48 NRCS Soil Ma	p Stream Order:		
County: Morgan			Township / Cit	y: Washington				
MISCEL	LANEOUS							
Base flow conditions	s? (Y/N) No	Date of last	t precipitation: 10/2	8/2015	Quantity	0.45		
Photograph informa	tion:							
Elevated Turbidity?	(Y/N) No	Canopy (%	% open): 40					
Were samples colle	cted for water ch	emistry? (Y/N)	No (Note lab	sample no. or id. and	d attach results) Lab nu	mber: N/A		
Field Measures:	Temp (C)	Dissolved of	oxygen (mg/l):	pH:	Conductivity (umho	os/cm):		
ls the sampling read	h representative	of the stream? (//N) Yes If no	t, please explain:	_			
Additional comment	s/description of p	ollution impacts:						
BIOTIC	EVALUATION							
Performed? (Y/N)	No (If	Yes, record all obse number. Include ar	rvations. Voucher col propriate field data she	lections optional. Note: eets from the Primary He	all voucher samples must adwater Habitat Assessm	be labeled with the site ent Manual.)		
Fish observed? (Y/N	l) <u>Yes</u> Vol	ucher? (Y/N)	Salamanders	observed? (Y/N)	Voucher? (Y/N)		
Frogs or tadpoles of	bserved? (Y/N)	Voucher?	' (Y/N) Aqua	tic Macroinvertebrate	es observed? (Y/N)	Voucher? (Y/N)		
	-							



Stream S6S011f - facing downstream



Stream S6S011f - facing downstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 31	
SITE NAME/LOCATION UNT 3 Sartor Ditch	
SITE NUMBER S6S011g RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.385
LENGTH OF STEAM REACH (ft) LAT 39.413096 LONG86.409369 RIVER CODE N/A RIVER MILE N/A	
DATE 10/28/2015 SCORER jk lo COMMENT	
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 RECOVER MODIFICATIONS:	ERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) TYPE PERCENT TYPE PERCENT	HHEI Aetric
Image: Note of the state of	oints
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 Su BEDROCK [16 pts] 0 I FINE DETRITUS [3 pts] 0 Ma	ubstrate lax = 40
COBBLE (65-256 mm) [9 pts 0 CLAY or HARDPAN [0 pts] 0 GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0	
□ ✓ SAND (<2 mm) [6 pts]	11
Total of Percentages of 0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 9 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)	ool Depth Max = 30
> >30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
>22.5 - 30 cm [30 pts] < 5 cm [5 pts]	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
 > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] 	Width Max = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.6	20
This information must also be completed PIPAPIAN ZONE AND ELOODPLAIN OLIALITY NOTE: River left (L) and Right (R) as looking downstream	
RIPARIAN ZONE AND FLOODFLAIN QUALITY	
I R (Per Bank I R (Most Predominant Per Bank) I R	
Wide >10 m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10 m Merce Forest, Shrub or Old Field Urban or Industrial V Narrow <5 m 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):	
 Steam Trowing Subsurface flow with isolated pools (interstitial) Comments: 	
SINUOSITY (Number of bends per 61 m (200 ft) of channel. Check ONLY one box)	
▼ None □ 1.0 □ 2.0 □ 3.0 □ 3.0	
✓ Flat (0.5 ft/100 ft))

DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch CWH Name: Distance from Evaluated Stream Distance from Evaluated Stream Distance from Evaluated Stream EWH Name: Distance from Evaluated Stream BWH Name: Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION SGS Quadrangle Name: Martinsville ounty: Morgan Township / City: Washington MISCELLANEOUS ase flow conditions? (Y/N) No ase flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quantity 0.93 hotograph information:	QHEI PERFORME	D Yes V No	QHEI Score:	(If yes, attach c	ompleted QHEI form)	
WWH Name: Sartor Ditch Distance from Evaluated Stream CWH Name: Distance from Evaluated Stream Distance from Evaluated Stream EWH Name: Distance from Evaluated Stream Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION JSGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: Morgan Township / City: Washington MisCELLANEOUS Biase flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quantity 0.93 'hotograph information:	DOWNSTREAM D	DESIGNATED USE(S)				
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 JSGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information: 2 Elevated Turbidity? (Y/N) No Canopy (% open): 70 Vere samples collected for water chemistry? (Y/N) No (Id Measures: Temp (C) Dissolved oxygen (mg/l): pH: conductivity (umhos/cm): s the sampling reach representative of the stream? (Y/N) Yerformed? (Y/N) No (If Yes, record all observations. Voucher collections optional. Note: all voucher samples must be labeled with the sit ID number. Include apropriate field data sheets from the Primary Headwater Habitat Assessment Manual.) Yerformed? (Y/N) No Salamanders observed? (Y/N) Voucher? (Y/N)	WWH Name: Sartor	Ditch		Dista	ance from Evaluated Stream	_
EWH Name: Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION JSGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: Morgan Township / City: Washington MISCELLANEOUS No Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	CWH Name:			Dista	ance from Evaluated Stream	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION ISGS Quadrangle Name: Martinsville	EWH Name:			Dista	ance from Evaluated Stream	
NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: county: Morgan Township / City: Washington MISCELLANEOUS wase flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quantity 0.93 thotograph information: levated Turbidity? (Y/N) No Canopy (% open): 70 Vere samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A ield Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): is the sampling reach representative of the stream? (Y/N) Yes If not, please explain: diditional comments/description of pollution impacts: BIOTIC EVALUATION terformed? (Y/N) No (If Yes, record all observations, Voucher collections optional. Note: all voucher samples must be labeled with the site iD number. Include apropriate field data sheets from the Primary Headwater Habitat Assessment Manual.) ish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N) Voucher? (Y/N)	MAPPING: ATTA	ACH COPIES OF MAPS, IN	CLUDING THE ENTIRE WAT	ERSHED AREA. CLE	ARLY MARK THE SITE LOCAT	ION
Kounty: Morgan Township / City: Washington MISCELLANEOUS Hase flow conditions? (Y/N) No Date of last precipitation: Photograph information: Protograph information: Elevated Turbidity? (Y/N) No Canopy (% open): 70 Vere samples collected for water chemistry? (Y/N) No Automation: Wore samples collected for water chemistry? (Y/N) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): N/A If not, please explain: Heid manual. Automational 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 in number. Include apropriate field data sheets from the Primary Headwater Habitat Assessment Manual.)	ISGS Quadrangle Name: M	lartinsville	NRCS Soil	Map Page: 48	NRCS Soil Map Stream	Order: 2
MISCELLANEOUS iase flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quantity 0.93 'hotograph information:	ounty: Morgan		Township / City: Wa	ashington		
Bise flow conditions? (Y/N) No Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information: Sevented Turbidity? (Y/N) No Canopy (% open): 70 Vere samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A ield Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): is the sampling reach representative of the stream? (Y/N) Yes If not, please explain: dditional comments/description of pollution impacts: BIOTIC EVALUATION 'erformed? (Y/N) No (If Yes, record all observations. Voucher collections optional. Note: all voucher samples must be labeled with the site in D number. Include apropriate field data sheets from the Primary Headwater Habitat Assessment Manual.) ish observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Coucher? (Y/N) Voucher? (Y/N)	MISCELLANEO	DUS				
Photograph information:	ase flow conditions? (Y/N)	No Date of las	st precipitation: 10/27/201	5	Quantity 0.93	
Elevated Turbidity? (Y/N)No Canopy (% open):70 Vere samples collected for water chemistry? (Y/N)No (Note lab sample no. or id. and attach results) Lab number:N/A ield Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): is the sampling reach representative of the stream? (Y/N)YesIf not, please explain: idditional 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 apropriate field data sheets from the Primary Headwater Habitat Assessment Manual.) is hobserved? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N) Voucher? (Y/N) is observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? (Y/N) Voucher? (Y/N)	Photograph information:					
Vere samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A ield Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm):	Elevated Turbidity? (Y/N)	No Canopy (% open): 70			
Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): s the sampling reach representative of the stream? (Y/N) Yes 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 apropriate field data sheets from the Primary Headwater Habitat Assessment Manual.) Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N) Voucher? (Y/N	Vere samples collected for v	water chemistry? (Y/N)	No (Note lab samp	le no. or id. and atta	ch results) Lab number:	N/A
s the sampling reach representative of the stream? (Y/N) Yes 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 apropriate 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)	ield Measures: Temp (C) Dissolved	oxygen (mg/l):	pH: C	conductivity (umhos/cm):	
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Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? (Y/N) Voucher? (Y/N)	ish observed? (Y/N)	Voucher? (Y/N)	Salamanders obser	ved? (Y/N)	Voucher? (Y/N)	
	rogs or tadpoles observed?	Y (Y/N) Voucher	? (Y/N) Aquatic Ma	croinvertebrates ob	served? (Y/N) Vouch	ner? (Y/N)
Comments Regarding Biology:	Comments Regarding Biolog	jà:				

DRAWING AMD NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

from the Backyan Residential The Backyan Backyan Contraction The st Channel No. Wethend Sixters to well Ag


Stream S6S011g - facing downstream



Stream S6S011g - facing upstream

Stream S6S013



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 5 Indian Creek	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.265 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	10
IDEM 303(d) Listed:	No	Quarter:	NW & NE
USACE Jurisdiction	Yes	Latitude:	39.406093
IDEM Jurisdiction:	Yes	Longitude:	-86.409489

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S013a	Intermittent	Channelized Ditch	9.33	1.43	QHEI = 24.5	165	0.04	0.00
S6S013b	Intermittent	Channelized Ditch	8.50	1.00	QHEI = 35	165	0.03	0.16
Total						330	0.07	0.16

* Includes both permanent and temporary impacts

The OHWM of the UNT 5 to Indian Creek ranges from 8.5 to 9.3 feet wide by 1.0 to 1.4 feet deep. The new culvert under the southern end of Artesian Way will be an 85 feet long by 20 feet wide by 5 feet high reinforced box culvert (41 cubic yards) (Structure P505). The proposed UNT 5 to Indian Creek channel will consist of 85 feet (0.02 acre) of encapsulation and 64 feet (0.014 acre) of open channel lined with revetment riprap for scour protection.

Approximately 165 feet (0.04 acre) of the UNT 5 to Indian Creek is located within the proposed right-of-way for Artesian Avenue and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 149 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection.

The OHWM of the UNT 5 to Indian Creek ranges from 8.5 to 9.3 feet wide by 1.0 to 1.4 feet deep. The new culvert under the southern end of Artesian Way will be an 82 feet long by 20 feet wide by 5 feet high reinforced box culvert (26 cubic yards) (Structure P504). The proposed UNT 5 to Indian Creek channel will consist 82 feet (0.020 acre) of encapsulation and 67 feet (0.013 acre) of open channel lined with revetment riprap for scour protection.

Approximately 165 feet (0.03 acre) of the UNT 5 to Indian Creek is located within the proposed right-of-way for Artesian

Avenue and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16.If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 149 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection.

IDEM		OWQ Bio	ological St	udies QHE	l (Qualitativ	/e Habitat I	Evaluatio	n Index)	
	Sample #		bioSample #	Strea	am Name		Location		
1000	Survoyor	Sampla Data	County	Macro S					1
	jk lo	10/28/2015	Morgan	N/A	ample Type	Complete	QHEI	Score:	24.5
1] SU	JBSTRATE	Check ONLY Two	predominant s	ubstrate TYPE E	BOXES;		NE (Or 2 and		
PREDOM	BEST TYI INANT BLDR/SLABS [' BOULDERS [9] COBBLE [8] GRAVEL [7] SAND [6]		OT PREDOMINANT PR HARD HARD DETRI MUCK SILT [2 ATTIF	PAN [4] P [2] [2] [2] [2]	R 70 V	ORIGIN LIMESTONE [TILLS [1] WETLANDS [0 HARDPAN [0] SANDSTONE RIP/RAP [0]		QUALITY HEAVY [-2] MODERATE [-1] NORMAL [0] FREE [1]	Substrate
	BEDROCK [5]		(Sco	re natural substr	rates:ignore	LACSTRINE [)]	MODERATE [-1]	Maximum
NUMB	ER OF BEST I	V 3 or les	s [0] slud	ge from point-so	urces)		-2]	NONE [1]	20
Comn	nents								
2J IN quality; quality that is s % Amo 30 2 Comm	STREAM CO 2-Moderate ar in moderate or stable, well dev unt UNDERCUT I OVERHANGI SHALLOWS ROOTMATS	WER Indicate pr nounts, but not of f greater amounts (eloped root wad in BANKS [1] NG VEGETATION [(IN SLOW WATER) [1]	resence 0 to 3 a nighest quality of e.g., very large deep/fast wate % Amount 1 F 1 F	and estiamte per or in small amou boulders in deep er, or deep, well- POOLS>70CM [2] COOTWADS [1] COULDERS [1]	cent: 0-Absent nts of highest q p or fast water, I defined, functind % Amount <u>~</u>	; 1- Very small a uality; 3- Highes arge diameter lo oal pools.) 30WS, BACKWA JATIC MACROPI SS OR WOODY E	mounts or if i t yg C TERS [1] HYTES [1] DEBRIS [1]	hore common c AMOU heck One (Or 2 a EXTENSIVE > MODERATE 2 SPARSE -<250 NEARLY ABSI Cov Maximu	of marginal JNT and average) .75% [11] 5-75% [7] % [3] ENT <5% [1] ver _m 20 6.0
3] CI	ANNEL MO	RPHOLOGY Ch	eck ONE in ead	ch category (Or 2	2 and average)				
SINU HIG MOI LOV NOI	OSITY H [4] DERATE [3] V [2] NE [1] Dents	DEVELOF	PMENT INT [7]	CHANNEI NONE [6] RECOVER RECOVER ✓ RECENT (L IZATION RED [4] RING [3] DR NO RECOVE	S1 ¥ RY [1]	F ABILITY HIGH [3] MODERATE LOW [1]	[2] Chanr Maximu	nel um 20 5.0
4] BA	ANK EROSIO	N AND RIPARIA	AN ZONE C	heck ONE in eac	ch category for E	EACH BANK (O	⁻ 2 per bank a	and average)	
River	right looking downs EROSION NONE/LITTLE [3 MODERATE [2] HEAVY/SEVERI MENTS	strea L R RIPA N WIDE 3] NARR E [1] ✔ ✔ NONE	ARIAN WID >50m [4] :RATE 10-50m OW 5-10m [2] NARROW [1] [0]	TH L R FL(☐ FOR 3] ☐ SCR ☐ RES ☐ FEN ☑ OPE	DOD PLAIN EST, SWAMP [3 UB OR OLD FIE IDENTIAL, PRK, CED PASTURE N PASURE, ROV	QUALITY] LD [2] .NEW FIELD [1] [1] Ind WCROP [0] pas	L R D CO UR UR MIN icate predom it 100m ripari	NSERVATION T BAN OR INDUST IING/CONSTRUC inant land use(s ^{an} Ripari Maximu	ILLAGE [1] (RIAL [0] CTION [0]) an JM 10 3.5
5] PC	OOL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Decreation	Dotontial
MAXI Check → 1 r 0.7 ✓ 0.4 0.2 < 0.2 Comn	MUM DEPT ONE (ONLY! n [6] - <1m [4] - <0.7m [2] - <0.4m [1] m [0] ments	H CHAN Check ON POOL WI ✓ POOL WI POOL WI	NEL WIDTH IE (Or 2 and av DTH > RIFFLE \ DTH = RIFFLE \ DTH < RIFFLE \	I erage) NIDTH [2] NIDTH [1] NIDTH [0]	CURRI Che TORRENTIAL VERY FAST [1] MODERATE [India	ENT VELOC ck All that apply [-1] SLC I] INTI I] INTI 1] EDE cate for reach -	ITY ERSTITIAL [-1 ERMITTENT [- DIES [1] DOOOIs and riffl	(Circle one and cor Primary C] Secondar 2] Po Curre es Maximu	contact y Contact ol/ ent 12
Indica	ate for functiona	al riffles; Best area	s must be large	enough to supp	ort a population				
of riff RIFFI BES BES ▼ BES	e-obligate spec E DEPTH ST AREAS>10cr ST AREAS 5-10c ST AREAS <5cm [meti	cies: RUN DE n [2] MAXIM cm [1] MAXIM n ric=0]	EPTH IUM >50cm [2] IUM<50cm [1]	Check One RIFFLE/R STABLE (MOD. STA UNSTABL	(Or 2 and avera UN SUBSTR e.g., Cobble, Bo IBLE (e.g, Large E (e.g., Fine Frv	age) RATE RIF ulder) [2] Gravel) [1] el, Sand) [0]	FFLE/RUN ■ NONE [2] ■ LOW [1] ■ MODERA ▼ EXTENSI	IO RIFFLE [MET EMBEDDEI TE [0] Riff VE [-1] Maximi	
Comn	nents	:				100 01 -			
6] <i>GR</i> /	A<i>DIENT</i> (1 ft/	mı)	U VERY LOW	- LOW [2 - 4] 5 [6 - 10]	% POOL:	100 % GI		Gradie	ent a
DR	AINAGE ARE	A (0.1 sq. mi.)	HIGH - VER	Y HIGH [10 - 6]	% RUN:	% RIF	FLE:	Maximu	um 2.0 10

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)



A-CANOPY

Comment

Sector Se	upstream (>10m, 3 read	ings, <10m reading in m	iddle); Round to the r	nearest whole percent
☐ 55% -<85%	Left	Middle	Right	Total Average
30%-<55% % oper	n %	%	%	%
10%-<30%				
✓ <10% - Closed				
B-AESTHETICS		<u>C-REC</u>	REATION	
Nuisance algae Oil sh	een	Area	Denth	
✓ Invasive macrophytes ✓ Trash	/Litter			
Excess turbidity	nce odor			
Discoloration Sludg	e deposits			
✓ Foam/Scum	/SSOs/Outfalls			
D-MAINTENANCE		E-ISSU	JES	
Public V Private		TWW	P CSO	NPDES
Active Historic		 Indus	stry 🗸 Urban	
Succession: Succession: Succession		Hard	ened 🔽 Dirt G	rime
Spray Islands Scoured		Cont	aminated L	andfill
Snag: ☐ Removed ✔ Modified		BMPs:	Construction	Sediment
Leveed: One sided Both ba	inks	🗌 Logg	ing 🗸 Irrigatio	n Cooling
Relocated Cutoffs		Erosion	: 🗸 Bank 🗸	Surface
Bedload: 🗌 Moving 🗌 Stable		False	e bank 🗌 Manı	ıre 🗌 Lagoon
Armoured Slumped		Wasł	n H2O 🗌 Tile 🛛	H2O table
Impounded Desiccated		Mine:	Acid Qua	rry
Flood control Drainage		Flow:	Natural S	tagnant
		Wetla	and Park	Issues: Golf
		Lawr	n 🗌 Home	
		Atmo	spheric depositi	on

Stream Drawing:





Stream S6S013a - facing downstream



Stream S6S013a - facing upstream

IDE		OWQ Bi	ological St	udies QHEI	(Qualitativ	e Habitat E	valuatio	n Index)	
	Sample #		bioSample #	Strea	am Name		Location		
1 time	SURVEYOR	Samula Data	N/A	Maara S		- Hobitot	-	1	1
1	jk lo	10/28/2015	Morgan	N/A	ample Type	Complete	QHEI	Score:	35
1] S	SUBSTRATE	Check ONLY Two estimate %	predominant so 6 and check eve	ubstrate TYPE B	OXES;	Check ON	E (Or 2 and	average)	
	BEST TYF BLDR/SLABS [1 BOULDERS [9] COBBLE [8] GRAVEL [7] SAND [6] BEDROCK [5] BER OF BEST T	PES PRESENT TOTAL % PRESENT TOTAL %	OT PREDOMINANT PR HARDI DETRI MUCK SILT [2 ARTIFI Ore [2] (Sco ss [0]	PAN [4] [2] [2] CIAL [0] PAN [4] PAN [4] P	ENT TOTAL % R 50 30 ates;ignore urces)	ORIGIN LIMESTONE [1] TILLS [1] WETLANDS [0] HARDPAN [0] SANDSTONE [0] LACSTRINE [0] SHALE [-1] COAL FINES [-]	QUALITY IEAVY [-2] MODERATE [-1] IORMAL [0] REE [1] XTENSIVE [-2] MODERATE [-1] IORMAL [0] IONE [1]	Substrate
Com	ments								
2] <i>I</i> , qualit qualit that is % An 20 20 20 20	NSTREAM CO y; 2-Moderate an y in moderate or s stable, well dev nount UNDERCUT E 1. OVERHANGI SHALLOWS (1. ROOTMATS)	VER Indicate p nounts, but not of I greater amounts (eloped root wad in BANKS [1] NG VEGETATION (IN SLOW WATER [1]	resence 0 to 3 a highest quality of e.g., very large deep/fast wate % Amount P [1] R [1] B	nd estiamte per or in small amoun boulders in deep r, or deep, well-o OOLS>70CM [2] OOTWADS [1] OULDERS [1]	cent: 0-Absent; hts of highest qu o or fast water, la defined, functino % Amount <u>0 0XB</u> <u>30 2</u> AQU <u>10 1</u> LOG	1- Very small ar iality; 3- Highest arge diameter log al pools.) OWS, BACKWAT ATIC MACROPH S OR WOODY DI	nounts or if n	nore common c AMOU heck One (Or 2 a EXTENSIVE > MODERATE 2 SPARSE -<25 NEARLY ABS Cov Maximu	of marginal JNT and average) 75% [11] 5-75% [7] % [3] ENT <5% [1] ver 20 11.0
31 (CHANNEL MOI	RPHOLOGY Ch	eck ONE in eac	h category (Or 2	and average)				
	JOSITY GH [4] DDERATE [3] DW [2] DNE [1] ments	DEVELOI	PMENT ENT [7] I	CHANNEL NONE [6] RECOVER RECOVER ✓ RECENT C	LIZATION ED [4] ING [3] DR NO RECOVER	ST. ↓ ♥ M ₹Y [1]	ABILITY HIGH [3] MODERATE [₋OW [1]	2] Chani Maximi	nel Jm 20 5.0
4] <i>E</i>	BANK EROSIO	N AND RIPARI	AN ZONE Ch	neck ONE in eac	h category for E	ACH BANK (Or	2 per bank a	nd average)	
	ver right looking downs EROSION NONE/LITTLE [3 MODERATE [2] HEAVY/SEVERE	L R RIPA WIDE MODE MODE MODE MODE NARR E [1]	ARIAN WID1 >50m [4] RATE 10-50m [OW 5-10m [2] NARROW [1] [0]	H L R FLC □ FOR FOR 3] □ SCR □ FEN □ FEN □ OPE	DOD PLAIN EST, SWAMP [3] UB OR OLD FIEI DENTIAL, PRK, CED PASTURE [N PASURE, ROV	QUALITY _D [2] NEW FIELD [1] 1] Indic VCROP [0] past	L R CON URE MIN cate predomi 100m riparia	NSERVATION T BAN OR INDUS ING/CONSTRUG nant land use(s an Ripari Maximu	ILLAGE [1] IRIAL [0] CTION [0] an Jm 10 4.0
5] F	POOL/GLIDE A	ND RIFFLE /RU	IN QUALITY					Descritter	De te utiet
MA) Chec →1 0.: 0.: 0.: 0.: 0.: 0.: 0.: 0.:	(IMUM DEPT k ONE (ONLY! m [6] 7 - <1m [4] 4 - <0.7m [2] 2 - <0.4m [1] .2m [0] ments	H CHAN Check ON ✓ POOL WI □ POOL WI □ POOL WI	NEL WIDTH IE (Or 2 and av DTH > RIFFLE V DTH = RIFFLE V DTH < RIFFLE V	erage) VIDTH [2] VIDTH [1] VIDTH [0]	CURRE Chec TORRENTIAL VERY FAST [1] MODERATE [1 Indic	ENT VELOCI ck All that apply [-1] SLOV I INTE I INTE I EDDI rate for reach - p	TY (N [1] RSTITIAL [-1] RMITTENT [-2 ES [1] ools and riffle	Circle one and cor Primary C Secondar 2] Po Curre Maximu	contrait nment on back) contact y Contact ol/ ent 12
Indi	cate for functions	al riffles: Best area	s must he large	enough to supp	ort a population				
of ri RIFF BE ♥ BE BE	ffle-obligate spec FLE DEPTH EST AREAS>10cr EST AREAS 5-10c EST AREAS 5-5cm [metr iments	n [2] ■ MAXIN m [1] ■ MAXIN m [1] ■ MAXIN n ic=0]	EPTH IUM >50cm [2] IUM<50cm [1]	Check One RIFFLE/RI STABLE (6 MOD. STA UNSTABL	(Or 2 and avera JN SUBSTR e.g., Cobble, Bou BLE (e.g, Large E (e.g., Fine Frve	ge) ATE RIF JIder) [2] Gravel) [1] el, Sand) [0]	□ <u>N</u> FLE/RUN □ NONE [2] □ LOW [1] □ MODERAT ✔ EXTENSIV	O RIFFLE [MET EMBEDDE EMBEDDE Riff FE [0] R /E [-1] Maximi	RIC=0] DNES ile/ un 8 1.0
6] <i>Gl</i>	RA <i>DIENT</i> (1 ft/r	mi)	VERY LOW	- LOW [2 - 4]	% POOL:	⁵⁰ % GL	IDE: 10	Crock	
Dŀ	RAINAGE ARE	A (0.1 sq. mi.)	MODERATE HIGH - VER'	[6 - 10] Y HIGH [10 - 6]	% RUN:	10 % RIF I	FLE: 30	Maxim	2.0

OWQ Biological Studies QHEI (Qualitative Habitat Evaluation Index)



A-CANOPY

Comment

>85% - Open	Looking upstrear	n (>10m, 3 readi	ngs, <10m reading in mi	ddle); Round to the	nearest whole percent
✓ 55% -<85%		Left	Middle	Right	Total Average
30%-<55%	% open	%	%	%	%
10%-<30%	-				
─ <10% - Closed					
B-AESTHETICS			<u>C-REC</u>	REATION	
Nuisance algae	Oil sheen		Area	Depth	
✓ Invasive macrophytes	✓ Trash/Litter			$t^2 \square > 3ft$	
Excess turbidity	✓ Nuisance od	lor			
Discoloration	Sludge depo	sits			
✓ Foam/Scum	CSOs/SSOs	Outfalls			
			E 1001		
D-MAINTENANCE			<u>E-1550</u>	<u>ES</u>	
Public V Private			WWT	P CSO	NPDES
✓ Active ∐ Historic			Indus	try 🖌 Urban	
Succession: Young	Old		Harde	ened 🗸 Dirt G	Frime
Spray Islands	Scoured		Conta	aminated 🗌 I	Landfill
Snag: 🗌 Removed 🗹 I	Modified		BMPs:	Construction	n 🗸 Sediment
Leveed: 🗌 One sided	Both banks		🗌 Loggi	ing 🗌 Irrigatio	on 🗌 Cooling
Relocated Cutoffs	5		Erosion:	Bank	Surface
Bedload: 🗸 Moving	Stable		False	bank 🗌 Man	ure 🗌 Lagoon
Armoured Slumpe	ed		Wash	H2O Tile	H2O table
Impounded Desicc	ated		Mine:	Acid Qua	arry
Flood control Dra	inage		Flow: 🗸	Natural 🗌 S	tagnant
			Wetla	nd Park	Issues: Golf
			✓ Lawn	Home	
			Atmo	spheric deposit	ion
				spheric deposit	

Stream Drawing:





Stream S6S013b - facing downstream



Stream S6S013b - facing upstream

Stream S6S014



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 5 Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.296 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	3
IDEM 303(d) Listed:	No	Quarter:	SW
USACE Jurisdiction	Yes	Latitude:	39.416695
IDEM Jurisdiction:	Yes	Longitude:	-86.413556

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S014a	Intermittent	Channelized Ditch	10.33	1.33	HHEI = 68	361	0.09	0.00
S6S014b	Intermittent	Culvert	7.33	1.20	N/A	230	0.04	0.00
S6S014c	Intermittent	Channelized Ditch	7.33	1.20	HHEI = 70	190	0.03	0.00
Total						781	0.16	0.00

* Includes both permanent and temporary impacts

Approximately 781 feet (0.185 acre) of the UNT 5 to Sartor Ditch will be relocated. The OHWM of the UNT 5 to Sartor Ditch averages ranges from 7.3 to 10.3 feet wide by 1.2 to 1.3 feet deep. The proposed new relocated UNT 5 to Sartor Ditch channel will be 1,027 feet (0.200 acre) in length and consist of 776 feet (0.24 acre) of open natural bottom channel, 207 feet (0.08 acre) of encapsulation, and 44 feet (0.010 acre) of open channel lined with class 1 riprap for scour protection. Structure P137 will replace the existing 225 feet long by 72-inch diameter culvert that carries SR 37 over the UNT 5 to Sartor Ditch with a new RCP structure (P137) that will be 207 feet long by 9 feet wide by 4 feet high. The stream relocation will result in a gain of 246 feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. A total of 300 feet of mitigation is being offered for the impacts to the portion of this stream that is currently a natural channel with tree cover and remaining 481 feet are being considered restored on-site within the proposed relocated channel.

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

68

SITE NAME/LOCATION UNT 5 Sartor Dite	h	
SITE NUMBER S	6S014a RIVER BASINIndian Creek - Sand Cree _ DRAINAGE AREA (mi)	0.296
LENGTH OF STEAM REACH (ft)	LAT 39.416695 LONG RIVER CODE N/A RIVER MILE	N/A
DATE 10/28/2015 SCORER jk lo	COMMENT	
NOTE: Complete All Items On This Form	- Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL NONE / NATUR MODIFICATIONS:	RAL CHANNEL 🔄 RECOVERED 📄 RECOVERING 🔽 RECENT OR NO REC	OVERY
1. SUBSTRATE (Estimate percent of ev (Max of 32). Add total number of signif	ery type of substrate presentCheck ONLY two predominant substrate TYPE boxes icant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	HHEI Metric
	PERCENT TYPE PERCENT	Points
BOULDER (>256 mm) [16 pts]	0 Image: Sill [3 pt] 0 0 Image: Leaf PACK/WOODY DEBRIS [3 pts] 0 0 Image: Leaf PACK/WOODY DEBRIS [3 pts] 0	Substrate
COBBLE (65-256 mm) [9 pts	0 CLAY or HARDPAN [0 pts] 0 CLAY or HARDPAN [0 pts]	wax = 40
GRAVEL (2-64 mm) [9 pts] ✓ ✓ SAND (<2 mm) [6 pts]	0 □ MOCK [0 pts] 0 100 □ ARTIFICIAL [3 pts] 0	13
Total of Percentages of Bldr Slabs. Boulder. Cobble. Bedrock	0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SI	JBSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPES 1	
2. MAXIMUM POOL DEPTH (Measure	the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from	road culverts or storm water pipes)	Max = 30
 > >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] 	30
	MAXIMUM POOL DEPTH (centimeters): 0	
COMMENTS: 3. BANK FULL WIDTH (Measured	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3")	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 25
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOOD	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODI RIPARIAN WIDTH	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 25
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODI RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Vide >10 m None Comments:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box):	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODI RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Vide >10 m None Comments: FLOW REGIME (At time of end) Subsurface flow with isolated poor Comments:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box):	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODI RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Vide >10 m None Comments: FLOW REGIME (At time of et al.) Subsurface flow with isolated poor Comments: SINUOSITY	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODI RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m None Comments: FLOW REGIME (At time of etc.) Steam flowing Subsurface flow with isolated poor Comments: SINUOSITY None 0.5	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 25

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ADDITIONAL ST	REAM INF	ORMATIC	ON (This	information	must also	be comple	te			
QHEI PE	RFORMED	Yes	✔ No	QHEI Sco	re:	(If yes, att	tach co	mpleted QF	IEI form)	
DOWNST	TREAM DES	IGNATED	USE(S)							
WWH Name:	Sartor Dite	ch					Dista	nce from Ev	aluated \$	Stream
CWH Name:							Dista	nce from Ev	aluated \$	Stream
EWH Name:							Dista	nce from Ev	aluated \$	Stream
MAPPIN	IG: ATTACH	COPIES OF	MAPS, INC	CLUDING THE E	ENTIRE WATE	RSHED AREA	. CLEA	ARLY MARK	THE SITE	LOCATION
JSGS Quadrangle	Name: Mart	insville			NRCS Soil	Map Page:	48	NRCS Sc	il Map S	tream Order:
County: Morgan				Townshi	p / City: Wa	shington				
MISCE		\$								
Base flow condition	15? (Y/N)	No	Date of las	t precipitation:	10/28/2015	5		Quantity	0.4	5
Photograph informa	ation:							· · · ·		
Elevated Turbidity?	? (Y/N) N	lo	Canopy (%	% open):	65					
Vere samples colle	ected for wate	er chemistr	y? (Y/N)	No (No	te lab sampl	e no. or id. ar	nd attac	ch results) L	ab numb	er: N/A
Field Measures:	Temp (C)		Dissolved	oxygen (mg/l):		pH:	C	onductivity (umhos/c	m):
s the sampling read	ch represent	ative of the	stream? (Y/N) Yes	If not, pleas	se explain:				
Additional comment	ts/descriptior	n of pollutic	on impacts:							
BIOTIC	EVALUAT	ION								
Performed? (Y/N)	No	(If Yes, re ID numbe	cord all obse r. Include a	ervations. Vouc propriate field da	her collections ata sheets fron	optional. Note n the Primary H	e: all vou leadwat	icher samples er Habitat Ass	s must be sessment	labeled with the s Manual.)
Fish observed? (Y/	N)	Voucher?	' (Y/N)	Salama	nders observ	ved? (Y/N)		Voucher?	(Y/N)	
Frage or todpolog o	bserved? (Y	/N)	Voucher	? (Y/N)	Aquatic Ma	croinvertebrat	tes obs	erved? (Y/N)	Voucher? (Y/N
Togs of taupoles o	(·	,	-	(.)	, iqualio ma			•	·	- ``

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





Stream S6S014a - facing downstream



Stream S6S014a - facing upstream

ChiefPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	70
SITE NAME/LOCATION UNT 5 Sartor Ditch	
SITE NUMBER S6S014c RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.005
LENGTH OF STEAM REACH (ft) LAT 39.416696 LONG86.412512 RIVER CODE N/A RIVER MILE I	1/A
DATE 10/28/2015 SCORER jk lo COMMENT	
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 V RECENT OR NO REC	OVERY
MODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.)	HHEI
	Metric
$\square \square BLDR SLABS [16 pts] 0 \square SILT [3 pt] 0$	Points
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 BEDROCK [16 pts] 0 FINE DETRITUS [3 pts] 0	Substrate Max = 40
COBBLE (65-256 mm) [9 pts 25 CLAY or HARDPAN [0 pts] 0	
SAND (<2 mm) [6 pts]	20
Total of Percentages of 25.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 18 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) 	Pool Depth Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
✓ >22.5 - 30 cm [30 pts] <5 cm [5 pts]	30
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 25	
BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (>13') [30 pts] > 1.0 m - 1.5m (>3'3" - 4'8") [15 pts]	Bankfull Width
 >3.0 m - 4.0m (>9'7" - 13') [25 pts] ✓ >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] 	Max = 30
COMMENTS: 76" CMP culvert AVERAGE BANKFULL WIDTH (Meters): 2.2	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	
Image Image I	
✓ Narrow <5 m	
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
Steam howing ✓ Moist channel, isolated pools, no how (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)	
\checkmark Note 1.0 2.0 3.0 0.5 1.5 2.5 >3.0	
STREAM GRADIENT ESTIMATE ✓ Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft /10) ft)

QHEI PERFORMED _ Yes 🖌 No QHEI Score: (If ye	es, attach completed QHEI form)						
DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch	Distance from Evaluated Stream						
CWH Name: EWH Name:	Distance from Evaluated Stream						
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION							
USGS Quadrangle Name: Martinsville NRCS Soil Map Pag	ge: 48 NRCS Soil Map Stream Order: ′						
County: Morgan Township / City: Washingto	on						
MISCELLANEOUS							
Base flow conditions? (Y/N) No Date of last precipitation: 10/28/2015	Quantity 0.45						
Photograph information:							
Elevated Turbidity? (Y/N) No Canopy (% open): 100							
Nere samples collected for water chemistry? (Y/N) No (Note lab sample no. or	id. and attach results) Lab number: N/A						
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):						
Is the sampling reach representative of the stream? (Y/N) Yes If not, please explain	in:						
Additional comments/description of pollution impacts:							
BIOTIC EVALUATION							
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. ID number. Include apropriate field data sheets from the Print	. Note: all voucher samples must be labeled with the site nary Headwater Habitat Assessment Manual.)						
Fish observed? (Y/N) Yes Voucher? (Y/N) Salamanders observed? (Y/I	N) Voucher? (Y/N)						
Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvert	tebrates observed? (Y/N) Voucher? (Y/N)						

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





Stream S6S014c - facing downstream



Stream S6S014c - facing downstream

Stream S6S015



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 6 Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.31 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	3
IDEM 303(d) Listed:	No	Quarter:	SW
USACE Jurisdiction	Yes	Latitude:	39.418593
IDEM Jurisdiction:	Yes	Longitude:	-86.410546

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S015a	Ephemeral	Roadside Ditch	3.00	0.67	HHEI = 19	1930	0.13	0.00
S6S015b	Ephemeral	Roadside Ditch	3.17	0.90	HHEI = 16	389	0.03	0.00
S6S015c	Ephemeral	Roadside Ditch	6.00	0.50	HHEI = 37	670	0.09	0.00
S6S015d	Ephemeral	Culvert	5.00	0.70	N/A	256	0.03	0.00
S6S015e	Ephemeral	Natural	5.00	0.70	HHEI = 29	157	0.02	0.01
S6S015f	Ephemeral	Culvert	5.00	0.70	N/A	0	0.00	0.00
S6S015g	Ephemeral	Culvert	4.17	1.00	N/A	0	0.00	0.00
S6S015h	Ephemeral	Natural	4.17	1.00	HHEI = 45	0	0.00	0.00
S6S015i	Ephemeral	Natural	6.50	0.37	HHEI = 46	52	0.01	0.11
S6S015j	Ephemeral	Culvert	6.50	0.37	N/A	39	0.01	0.00
S6S015k	Ephemeral	Natural	5.17	0.50	HHEI = 59	174	0.02	0.19
S6S015l	Ephemeral	Culvert	3.75	0.70	N/A	0	0.00	0.00
S6S015m	Ephemeral	Channelized Ditch	3.75	0.70	HHEI = 30	62	0.01	0.00
S6S015n	Ephemeral	Culvert	2.45	0.60	N/A	53	<0.01	0.00
S6S015o	Ephemeral	Channelized Ditch	2.45	0.60	HHEI = 6	159	0.01	0.00
S6S015p	Ephemeral	Culvert	5.40	0.50	N/A	0	0.00	0.00
S6S015q	Ephemeral	Natural	5.40	0.50	HHEI = 28	0	0.00	0.00
S6S015r	Ephemeral	Natural	6.17	0.37	HHEI = 33	0	0.00	0.00
S6S015s	Ephemeral	Natural	5.33	0.37	HHEI = 34	18	<0.01	0.00
Total						3959	0.35	0.31

* Includes both permanent and temporary impacts

The OHWM of the UNT 6 to Sartor Ditch averages 3.0 to 5.0 feet wide by 0.5 to 0.9 feet deep. The existing 67 feet long by 42-inch diameter RCP structure that carries SR 252 over the UNT 6 to Sartor Ditch will be replaced with a 118 feet long by 60 inch wide by 48 inches high RCB (17 cubic yards) (Structure P516). Permanent impacts to UNT 6 to Sartor Ditch will include 46 feet of revetment riprap (0.005 acre) and 118 feet (0.014 acre) of encapsulation for a total length of 164 feet.

Approximately 275 feet (0.03 acre) of the UNT 6 to Sartor Ditch is located with the existing right-of-way and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 97 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection. Mitigation is not being offered for the 67 feet of existing encapsulation.

The OWHM of the UNT 6 to Sartor Ditch ranges from 3.0 to 5.0 feet wide by 0.5 to 0.9 feet deep. Impacts to the UNT 6 to Sartor Ditch include replacing the existing 39-foot-long by 96-inch diameter CMP that carries Cramertown Loop road over the UNT 6 to Sartor Ditch with a 68 foot long by 10 feet wide by 4 feet high RCB structure (10 cubic yards) (Structure P515). The permanent impacts to UNT 6 to Sartor Ditch will include 23 feet (0.008 acre) of revetment riprap and 68 feet (0.007 acre) encapsulation for a total length of 91 feet.

Approximately 264 feet (0.020 acre) of UNT 6 to Sartor is located within the right-of-way for Cramertown Loop Road and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. Of these impacts, 91 linear feet are accounted for under Stream Impact 9 associated with the crossing of Cramertown Loop and 173 linear feet are associated with Stream Impact 22 and the relocation of the UNT 6 to Sartor Ditch within the proposed right-of-way. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 102 feet of mitigation is being offered for this stream impact due to the new encapsulation and riprap for scour protection. Mitigation is not being offered for the 39 feet of existing encapsulation.

Approximately 12 feet (0.002 acre) of the UNT 6 to Sartor Ditch will be lined with revetment riprap at the outlet of structure P154 for scour protection. Note that UNT 6 to Sartor Dich begins at the outlet of this structure. The OHWM of the UNT 6 to Sartor Ditch in this location is 5.3 feet wide and 0.4 feet deep.

The construction staging of this contract will be sequenced such that the channel stabilization is constructed prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the scour protection, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

A total of 12 feet of mitigation is being offered for the impacts to this stream.

Approximately 3,402 feet (0.234 acre) of the UNT 6 to Sartor Ditch will be relocated. The OHWM of the UNT 6 to Sartor Ditch ranges from 3.0 to 6.0 feet wide by 0.5 to 0.9 feet deep. The proposed new relocated UNT 6 to Sartor Ditch channel will consist of 2,959 feet (0.204 acre) of open natural bottom channel, 500 feet (0.034 acre) of encapsulation, and 68 feet (0.005 acre) of open channel lined with revetment riprap for scour protection. The existing 236 feet long by 84-inch diameter CMP structure that carries SR 37 over the UNT 6 to Sartor Ditch will be replaced with 500 feet long by 90 in diameter RCP (Structure P144). The relocation of the UNT 6 to Sartor Ditch will result in the gain of 125 feet of stream. In addition, the new bridge structure (P506) at Grand Valley will cross the relocated UNT 6 to Sartor Ditch.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. A total of 2,959 feet of this stream are being considered restored on-site and 443 feet of mitigation is being offered for the loss of natural channel length, increase in encapsulation and placement of riprap scour protection.

Approximately 173 feet (0.020 acre) of the roadside channel will be relocated into a proposed new captured roadside channel. The OHWM of the UNT 6 to Sartor Ditch averages 5.2 feet wide by 0.5 feet deep. The new proposed relocated channel will consist of 143 feet (0.020 acre) of open natural bottom channel upstream of the proposed culvert carrying Cramertown Loop over UNT 6 to Sartor Ditch. The stream relocation will result in a loss of 30 feet of stream. The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. A total of 143 feet of this stream are being considered restored on-site and 26 feet of mitigation is being offered for the loss of natural channel length.

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

19

SITE NAME/LOCATION UNT 6 Sartor Ditcl	h	
SITE NUMBER SE	6S015a RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.31
LENGTH OF STEAM REACH (ft)	LAT 39.418593 LONG86.410546 RIVER CODE N/A RIVER MILE	E N/A
DATE 10/27/2015 SCORER mr dd	COMMENT	
NOTE: Complete All Items On This Form	- Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL NONE / NATUR MODIFICATIONS:	RAL CHANNEL 🔲 RECOVERED 🗌 RECOVERING 🔽 RECENT OR NO R	ECOVERY
1. SUBSTRATE (Estimate percent of ever (Max of 32). Add total number of signifi	ery type of substrate presentCheck ONLY two predominant substrate TYPE boxes icant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	HHEI Metric
	PERCENT TYPE PERCENT	Points
BLDIX SLADS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pts] COBBLE (65-256 mm) [9 pts] GRAVEL (2-64 mm) [9 pts] ✓ SAND (<2 mm) [6 pts]	0 0 0 0 0 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 0 FINE DETRITUS [3 pts] 0 0 CLAY or HARDPAN [0 pts] 0 0 MUCK [0 pts] 0 95 ARTIFICIAL [3 pts] 5	Substrate Max = 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SU	JBSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPES 2	
2. MAXIMUM POOL DEPTH (Measure the evaluation. Avoid plunge pools from r	the maximum pool depth within the 61 meter (200 ft)evaluation reach at the time of road culverts or storm water pipes)	Pool Depti Max = 30
 >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] 	0
	MAXIMUM POOL DEPTH (centimeters): 0	
BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
Source Second Provided Hyperbolic 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0m (<=3'3")	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>97" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30 5
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30

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QHEI PERFORMED	Yes 🖌 No	QHEI Score:	(If yes, atta	ach completed QHEI for	rm)
DOWNSTREAM DE	SIGNATED USE(S)				
WWH Name: Sartor Di	itch			Distance from Evaluate	ed Stream
CWH Name:				Distance from Evaluate	ed Stream
_ EWH Name:				Distance from Evaluate	ed Stream
MAPPING: ATTAC	H COPIES OF MAPS, IN	CLUDING THE ENTIRE	WATERSHED AREA.	CLEARLY MARK THE S	ITE LOCATION
ISGS Quadrangle Name: Mar	rtinsville	NRCS	Soil Map Page:	48 NRCS Soil Ma	o Stream Order:
County: Morgan		Township / City:	Washington		
MISCELLANEOL	JS				
Base flow conditions? (Y/N)	Yes Date of las	st precipitation: 10/27	/2015	Quantity	0.93
Photograph information:					
Elevated Turbidity? (Y/N)	No Canopy (% open): 100			
Vere samples collected for wa	ater chemistry? (Y/N)	No (Note lab s	ample no. or id. and	d attach results) Lab nu	mber: N/A
Field Measures: Temp (C)) Dissolved	oxygen (mg/l):	pH:	Conductivity (umho	s/cm):
s the sampling reach represen	ntative of the stream? (Y/N) Yes If not,	please explain:	-	
	• · · · · ·	:			
Additional comments/descriptic	on of pollution impacts.				
Additional comments/descriptic	on of pollution impacts				
Additional comments/description	on of pollution impacts				
Additional comments/description	on of pollution impacts	ervations. Voucher colle propriate field data sheet	ctions optional. Note: is from the Primary He	all voucher samples must adwater Habitat Assessm	be labeled with the site ent Manual.)
Additional comments/description BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N)	on of pollution impacts .TION (If Yes, record all obs ID number. Include a Voucher? (Y/N)	ervations. Voucher colle propriate field data sheet Salamanders o	ctions optional. Note: ts from the Primary He bserved? (Y/N)	all voucher samples must eadwater Habitat Assessm Voucher? (Y/N	be labeled with the site ent Manual.)
BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N)	TION (If Yes, record all obsection ID number. Include a Voucher? (Y/N)	ervations. Voucher collee propriate field data sheet Salamanders o ? (Y/N) Aquatio	ctions optional. Note: is from the Primary He bserved? (Y/N) c Macroinvertebrate	all voucher samples must adwater Habitat Assessm Voucher? (Y/N as observed? (Y/N)	be labeled with the site ent Manual.)) Voucher? (Y/N)
Additional comments/description BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (N Comments Regarding Biology:	TION (If Yes, record all obs ID number. Include a Voucher? (Y/N)	ervations. Voucher colle propriate field data sheet Salamanders o ? (Y/N) Aquation	ctions optional. Note: ts from the Primary He bserved? (Y/N) c Macroinvertebrate	all voucher samples must eadwater Habitat Assessm Voucher? (Y/N es observed? (Y/N)	be labeled with the site ent Manual.)) Voucher? (Y/N)
Additional comments/description BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (N Comments Regarding Biology:	TION (If Yes, record all obs ID number. Include a Voucher? (Y/N)	ervations. Voucher colle propriate field data sheet Salamanders o ? (Y/N) Aquatio	ctions optional. Note: is from the Primary He bserved? (Y/N) c Macroinvertebrate	all voucher samples must adwater Habitat Assessm Voucher? (Y/N es observed? (Y/N)	be labeled with the site ent Manual.)) Voucher? (Y/N)

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Stream S6S015a - facing upstream



Stream S6S015a - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	
SITE NAME/LOCATION UNT 6 Sartor Ditch	
SITE NUMBER S6S015b RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) C	0.27
LENGTH OF STEAM REACH (ft) LAT 39.420871 LONG86.407686 RIVER CODE N/A RIVER MILE N/A	
DATE 10/27/2015 SCORER mr dd COMMENT	
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 RECOVER MODIFICATIONS:	RY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) H TYPE PERCENT TYPE PERCENT PERCENT PERCENT	IHEI etric oints
BLDR SLABS [16 pts] 0 SLL [3 pt] 0 BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 BEDROCK [16 pts] 0 FINE DETRITUS [3 pts] 0 Ma: COBBLE (65-256 mm) [9 pts] 0 CLAY or HARDPAN [0 pts] 0 Ma:	bstrate ax = 40
✓ ✓ SAND (<2 mm) [6 pts]	11
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B) (B)	A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 9 TOTAL NUMBER OF SUBSTRATE TYPES 2	
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) Ma	ol Deptl ax = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts] >22.5 - 30 cm [30 pts] <5 cm [5 pts]	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Ba > 4.0 meters (>13') [30 pts] >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] V > 3.0 m - 4.0m (>9'7" - 13') [25 pts] ✓ >1.0 m (<=3'3") [5 pts]	ankfull Width ax = 30
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	
Wide >10 m Mature Forest, Wetland Conservation Tillage Moderate 5-10 m Immature Forest, Shrub or Old Field Urban or Industrial Narrow <5 m	
FLOW REGIME (At time of evaluation) (Check ONLY one box): Steam flowing Moist channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (interstitial) ✓ 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 >3.0	
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)	

QHEI PERFORM	ED Yes	; 🖌 No	QHEI Score:	(If yes, at	ttach cor	npleted QHEI	form)	
DOWNSTREAM	DESIGNATE) USE(S)						
WWH Name: Sarton	r Ditch				Distan	ce from Evalu	lated Stream	
CWH Name:					Distan	ce from Evalu	lated Stream	
EWH Name:					Distan	ce from Evalu	lated Stream	
MAPPING: ATT	ACH COPIES C	F MAPS, INCLU	IDING THE ENTIRE	WATERSHED ARE	A. CLEAI	RLY MARK THE	E SITE LOCATION	
JSGS Quadrangle Name:	Martinsville		NRCS	Soil Map Page:	48	NRCS Soil M	/lap Stream Order:	0
County: Morgan			Township / City:	Washington				
MISCELLANE	OUS							
Base flow conditions? (Y/N)) No	Date of last pr	recipitation: 10/27	/2015		Quantity	0.93	
Photograph information:						·		
Elevated Turbidity? (Y/N)	No	Canopy (% c	pen):					
Vere samples collected for	water chemis	try? (Y/N)	No (Note lab s	ample no. or id. a	nd attacl	n results) Lab	number:	I/A
Field Measures: Temp	(C)	Dissolved oxy	/gen (mg/l):	pH:	Co	nductivity (um	ihos/cm):	
s the sampling reach repre	sentative of th	e stream? (Y/N	I) Yes If not,	please explain:	_			
Additional comments/descri	iption of polluti	on impacts:						
BIOTIC EVAL	UATION							
Performed? (Y/N) No	(If Yes, r ID numb	ecord all observa er. Include apro	ations. Voucher colle priate field data shee	ctions optional. Not ts from the Primary I	e: all voud Headwate	her samples mi r Habitat Asses	ust be labeled with th sment Manual.)	ie site
	Voucher	? (Y/N)	Salamanders o	bserved? (Y/N)		Voucher? (Y	//N)	
Fish observed? (Y/N)		Voucher? (Y	//N) Aquati	c Macroinvertebra	ites obse	rved? (Y/N)	Voucher? (Y/N)
Fish observed? (Y/N)	'? (Y/N)							
Fish observed? (Y/N) Frogs or tadpoles observed Comments Regarding Biolo	!? (Y/N) 'gy:							
Fish observed? (Y/N)	יgy:							
Fish observed? (Y/N)	!? (Y/N) ıgy:							

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Stream S6S015b - facing downstream



Stream S6S015b - facing upstream

ChicEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 37	7
SITE NAME/LOCATION UNT 6 Sartor Ditch	
SITE NUMBER_S6S015c RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.26
LENGTH OF STEAM REACH (ft) LAT LAT LONG86.406456 RIVER CODE RIVER MILE	4
DATE 10/27/2015 SCORER mr dd COMMENT	
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 RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERED	'ERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.)	HHEI
	Metric
ITPE PERCENT ITPE PERCENT BLDR SLABS [16 pts] 0 SILT [3 pt] 0	Points
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 S	ubstrate
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	viax = 40
□ GRAVEL (2-64 mm) [9 pts] 5 □ MUCK [0 pts] 0 ✓ ✓ SAND (<2 mm) [6 pts]	17
Total of Percentages of Bildr Slabs, Boulder, Cobble, Bedrock 0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 15 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) 	'ool Depth Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
 >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] ✓ No Water or Moist Channel [0 pts] 	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>3'3" - 4'8") [15 pts] = -1.0m (3'3") [5 pts]	Width Max = 30
 ✓ >1.5 m - 3.0 m(>97" - 4'8") [20 pts] ✓ = 1.0 m (×-3.3) [5 pts] 	
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.8	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 >10 m Ature Forest, Wetland Conservation Tillage	
☐ ☐ Moderate 5-10 m ☐ ☐ Immature Forest, Shrub or Old Field ☑ ☐ Urban or Industrial ✔ ✔ Narrow <5 m ☐ ✔ Residential. Park. New Field ☐ Open Pasture. Row Crop	
None Fenced Pasture Mining or Construction	
Comments: SR37 on left	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
 Steam flowing Subsurface flow with isolated pools (interstitial) 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 >2.0	
STREAM GRADIENT ESTIMATE	
☐ Flat (0.5 ft/100 ft)	t)

			ormation mus	t also be complete	<u>e</u>			
QHEI PERFOR	RMED Y	es 🖌 No	QHEI Score:	(If yes, atta	ch completed QHEI for	m)		
		ED USE(S)			Distance from Evolution	d Streem		
CWH Name: Sar	tor Ditch				Distance from Evaluate	d Stream		
FWH Name:					Distance from Evaluate	d Stream		
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION								
JSGS Quadrangle Name	e: Martinsville	•	NRC	S Soil Map Page:	48 NRCS Soil Map	Stream Order: 0		
County: Morgan			Township / City	y: Washington				
	NEOUS	Dete of least w			O			
Base flow conditions? (Y	/N) Yes	Date of last pr	ecipitation: 10/2	7/2015	Quantity	.93		
hotograph information:								
Elevated Turbidity? (Y/N) No	Canopy (% o	pen): 25					
Vere samples collected	for water chem	istry? (Y/N)	No (Note lab	sample no. or id. and	l attach results) Lab nui	mber: N/A		
ield Measures: Ter	np (C)	Dissolved oxy	gen (mg/l):	pH:	Conductivity (umhos	s/cm):		
s the sampling reach rep	presentative of	the stream? (Y/N) Yes If no	t, please explain:				
Additional comments/des	scription of poll	ution impacts:						
BIOTIC EVA								
Performed? (Y/N)	lo (If Yes ID nur	s, record all observa nber. Include aprop	itions. Voucher coll priate field data she	lections optional. Note: ets from the Primary He	all voucher samples must adwater Habitat Assessme	be labeled with the site ent Manual.)		
	Vouch	er? (Y/N)	Salamanders	observed? (Y/N)	Voucher? (Y/N)			
-isn observed? (Y/N)								
-isn observed? (Y/N) -rogs or tadpoles observ	′ed? (Y/N)	Voucher? (Y	′/N) Aqua	tic Macroinvertebrate	s observed? (Y/N)	Voucher? (Y/N)		

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

1/ .5		5837
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	s -5	Validation of the Annual State



Stream S6S015c - facing downstream



Stream S6S015c - facing downstream

ChieEPA Primary Headwater	Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)
SITE NAME/LOCATION UNT 6 Sartor Ditch	
SITE NUMBER S6S015e RIVER BA	SIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.355
LENGTH OF STEAM REACH (ft) LAT 39.42253 LO	NG86.405195 RIVER CODE N/A RIVER MILE N/A
DATE 10/28/2015 SCORER mr dd COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evalua	ation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL REC MODIFICATIONS:	OVERED RECOVERING RECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate pre (Max of 32). Add total number of significant subsrate types found	esentCheck ONLY two predominant substrate TYPE boxes d (Max of 8). Final metric score is sum of boxes A and B.)
TYPE PERCENT TYPE	PERCENT POINTS
BLDR SLABS [16 pts] 0	SILT [3 pt] 10 Substrate
BEDROCK [16 pts] 0 0	FINE DETRITUS [3 pts] 0 Max = 40
GRAVEL (2-64 mm) [9 pts]	CLAY or HARDPAN [0 pts] 0 MUCK [0 pts] 0
✓ ✓ SAND (<2 mm) [6 pts] 90	ARTIFICIAL [3 pts] 14
Total of Percentages of A Bldr Slabs, Boulder, Cobble, Bedrock (A)	Substrate Percentage Check 100 % (B) (A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 12	TOTAL NUMBER OF SUBSTRATE TYPES 2
2. MAXIMUM POOL DEPTH (Measure the maximum pool depth evaluation. Avoid plunge pools from road culverts or storm wat	n within the 61 meter (200 ft)evaluation reach at the time of er pipes) Max = 30
>>30 centimeters [20 pts]	□ >5 cm - 10 cm [15 pts]
>22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts]	<5 cm [5 pts] ✓ No Water or Moist Channel [0 pts] 0
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0
3BANK FULL WIDTH (Measured as the average of 3-4	measurements) (Check ONLY one box): Bankfull
> 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts]	✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Width <=1.0m (<=3'3") [5 pts] Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 1.5
	nust also be completed
I R (Per Bank I R (Most Predomi	nant Per Bank) I B
□ □ Wide >10 m □ □ Mature Forest	t, Wetland
│ │ Moderate 5-10 m │ │ Immature Ford	est, Shrub or Old Field Urban or Industrial
V None Fenced Pastu	re Mining or Construction
Comments: mowed lawns with scattered trees	
FLOW REGIME (At time of evaluation) (Check ONLY)	one box):
 Steam flowing Subsurface flow with isolated pools (interstitial) Comments: 	 Moist channel, isolated pools, no flow (intermittent) Dry channel, no water (Ephemeral)
SINUOSITY (Number of bends per 61 m (200 ft) of chann	el. Check ONLY one box)
	□ 2.5 □ >3.0
☐ Flat (0.5 ft/100 ft)	ft/100 ft)

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QHEI PERFORMED ☐ Yes ✔ No QHEI Score: (If yes	s, attach completed QHEI form)
DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch CWH Name: EWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED A	REA. CLEARLY MARK THE SITE LOCATION
JSGS Quadrangle Name: Martinsville NRCS Soil Map Page	e: 48 NRCS Soil Map Stream Order: 2
County: Morgan Township / City: Washington	ı
MISCELLANEOUS	
Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015	Quantity 0.93
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open): 75	
Nere samples collected for water chemistry? (Y/N) No (Note lab sample no. or id	d. and attach results) Lab number: N/A
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):
s the sampling reach representative of the stream? (Y/N) Yes If not, please explain	ז:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. ID number. Include apropriate field data sheets from the Prima	Note: all voucher samples must be labeled with the site ary Headwater Habitat Assessment Manual.)
-ish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N) Voucher? (Y/N)
Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverte	brates observed? (Y/N) Voucher? (Y/N)

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





Stream S6S015e - facing downstream



Stream S6S015e - facing upstream

ChieFPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	5
SITE NAME/LOCATION UNT 6 Sartor Ditch	
SITE NUMBER S6S015h RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.335
LENGTH OF STEAM REACH (ft) LAT J9.422131 LONG86.401322 RIVER CODE N/A RIVER MILE	/A
DATE 10/28/2015 SCORER mr dd COMMENT	
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 RECO	VERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	HHEI
TYPE PERCENT TYPE PERCENT	Metric
BEDROCK [16 pts] 0 FINE DETRITUS [3 pts] 0	Max = 40
COBBLE (65-256 mm) [9 pts 0 CLAY or HARDPAN [0 pts] 0 GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0	
✓ SAND (<2 mm) [6 pts]	15
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPES 3	
 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) 	Pool Depth Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
□ >22.5 - 30 cm [30 pts] □ <5 cm [5 pts]	15
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 8	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
 > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] 	Max = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.3	15
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	
✓ Moderate 5-10 m ✓ ✓ <t< td=""><td></td></t<>	
✓ Narrow <5 m	
Comments: residential properties w/ unmanicured riparian corridors	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
Steam flowing Moist channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (interstitial)	
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 \checkmark	
STREAM GRADIENT ESTIMATE	ft)
	11)

DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch Distance from Evaluated Stream CWH Name: Distance from Evaluated Stream EWH Name: Distance from Evaluated Stream Distance from Evaluated Stream Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: County: Morgan Township / City: Washington MiSCELLANEOUS Base flow conditions? (Y/N) Yes Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	QHEI PEI	RFORMED	Yes	✔ No	QHEI Score	e:	(If yes, at	tach co	mpleted QH	HEI form)	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	DOWNST WWH Name: CWH Name: EWH Name:	REAM DESIG Sartor Ditch	GNATED USE(S) h						Distance from Evaluated Stream		
USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order:	MAPPIN	G: ATTACH C	A. CLEA	RLY MARK	THE SITE						
Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	USGS Quadrangle I	Name: Martin	sville			NRCS Soil I	Map Page:	48	NRCS So	oil Map Str	eam Order:
MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	County: Morgan				Township	/ City: Wa	shington				
Elevated Turbidity? (Y/N) No Canopy (% open): 20 Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): Is the sampling reach representative of the stream? (Y/N) Yes If not, please explain: Additional comments/description of pollution impacts:	MISCEL Base flow conditions Photograph informa	-LANEOUS s? (Y/N) <u>Y</u> € tion:	: s D;	ate of last p	recipitation:	10/27/2015			Quantity	0.93	
Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm):	Elevated Turbidity?	(Y/N) No	(anopy (% o	open):	20					
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): Is the sampling reach representative of the stream? (Y/N) Yes 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 apropriate 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)	Were samples colle	cted for water		? (Y/N)	No (Not	e lab sample	e no. or id. a	nd attac	h results) L	ab numbe	er: N/A
Is the sampling reach representative of the stream? (Y/N) Yes If not, please explain: Additional comments/description of pollution impacts:	Field Measures:	Temp (C)	Di	ssolved ox	ygen (mg/l):		pH:	Co	onductivity	umhos/cn	ו):
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 apropriate 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)	ls the sampling reac	h representati	ve of the s	tream? (Y/I	√) <u>Yes</u>	lf not, pleas	e explain:				
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 apropriate 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)	Additional comment	s/description c	f pollution	impacts:							
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 apropriate 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)	BIOTIC	EVALUATIC	N								
Fish observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? (Y/N)	Performed? (Y/N)	No	lf Yes, reco D number	ord all observ Include apro	ations. Vouch priate field da	er collections ta sheets from	optional. Note the Primary H	e: all vou leadwate	cher sample er Habitat As	s must be la sessment N	abeled with the site lanual.)
Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? (Y/N) Voucher? (Y/N)	Fish observed? (Y/N	J) V	oucher? (Y/N)	Salamar	iders observ	ed? (Y/N)		Voucher	? (Y/N)	
	Frogs or tadpoles ol	oserved? (Y/N)		Voucher? (Y/N)	Aquatic Mad	roinvertebra	tes obs	erved? (Y/N	1)	Voucher? (Y/N)

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



Stream S6S015h - facing downstream



Stream S6S015h - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	\$
SITE NAME/LOCATION UNT 6 Sartor Ditch	
SITE NUMBER S6S015i RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.075
LENGTH OF STEAM REACH (ft) LAT 39.422346 LONG86.399659 RIVER CODE N/A RIVER MILE N/A	<u> </u>
DATE 10/28/2015 SCORER mr dd COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL VONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVE MODIFICATIONS:	ERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) Image: Constraint of boxes A and B.) TYPE PERCENT TYPE PERCENT BLDR SLABS [16 pts] 0 Image: Constraint of boxes A and B.) PERCENT BOULDER (>256 mm) [16 pts] 0 Image: Constraint of boxes A and B.) PERCENT BEDROCK [16 pts] 0 Image: Constraint of boxes A and B.) Image: Constraint of boxes A and B.) Image: Constraint of boxes A and B.)	HHEI Metric Point: Jubstrat Max = 4(
□ COBBLE (65-256 mm) [9 pts] 0 □ CLAY or HARDPAN [0 pts] 0 □ GRAVEL (2-64 mm) [9 pts] 0 □ MUCK [0 pts] 0 ✓ SAND (<2 mm) [6 pts]	11
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 9 TOTAL NUMBER OF SUBSTRATE TYPES 2	
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) Performance	ool Der Max = 3
>>30 centimeters [20 pts] ✓ >5 cm - 10 cm [15 pts] >22.5 - 30 cm [30 pts] <5 cm [5 pts]	15
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 10	
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 - 1.5m (>3'3" - 4'8") [15 pts] □ > 3.0 m - 4.0m (>9'7" - 13') [25 pts] □ > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	Bankfu Width Max = 3
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 2	20
This information must also be completed RIPARIAN ZONE AND EL COOPELAIN OLIALITY 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 >10 m Mature Forest, Wetland Immature Forest, Shrub or Old Field Urban or Industrial Moderate 5-10 m ✓ ✓ Immature Forest, Shrub or Old Field Urban or Industrial Narrow <5 m Fenced Pasture Open Pasture, Row Crop None Comments: 6 residential properties w/ unmanicured ripairian corridors	
FLOW REGIME (At time of evaluation) (Check ONLY one box): Steam flowing Moist channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (interstitial) Image: 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 >3.0	
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)	:)

DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch Distance from Evaluated Stream CWH Name: Distance from Evaluated Stream EWH Name: Distance from Evaluated Stream Distance from Evaluated Stream Distance from Evaluated Stream MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: County: Morgan Township / City: Washington MiSCELLANEOUS Base flow conditions? (Y/N) Yes Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	QHEI PEI	RFORMED	Yes	✔ No	QHEI Score	e:	(If yes, at	tach co	mpleted QH	HEI form)	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	DOWNST WWH Name: CWH Name: EWH Name:	REAM DESIG Sartor Ditch	GNATED USE(S) h						Distance from Evaluated Stream		
USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order:	MAPPIN	G: ATTACH C	A. CLEA	RLY MARK	THE SITE						
Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	USGS Quadrangle I	Name: Martin	sville			NRCS Soil I	Map Page:	48	NRCS So	oil Map Str	eam Order:
MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	County: Morgan				Township	/ City: Wa	shington				
Elevated Turbidity? (Y/N) No Canopy (% open): 20 Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): Is the sampling reach representative of the stream? (Y/N) Yes If not, please explain: Additional comments/description of pollution impacts:	MISCEL Base flow conditions Photograph informa	-LANEOUS s? (Y/N) <u>Y</u> € tion:	: s D;	ate of last p	recipitation:	10/27/2015			Quantity	0.93	
Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm):	Elevated Turbidity?	(Y/N) No	(anopy (% o	open):	20					
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): Is the sampling reach representative of the stream? (Y/N) Yes 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 apropriate 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)	Were samples colle	cted for water	 chemistry?	? (Y/N)	No (Not	e lab sample	e no. or id. a	nd attac	h results) L	ab numbe	er: N/A
Is the sampling reach representative of the stream? (Y/N) Yes If not, please explain: Additional comments/description of pollution impacts:	Field Measures:	Temp (C)	Di	ssolved ox	ygen (mg/l):		pH:	Co	onductivity	umhos/cn	ו):
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 apropriate 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)	ls the sampling reac	h representati	ve of the s	tream? (Y/I	√) <u>Yes</u>	lf not, pleas	e explain:				
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 apropriate 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)	Additional comment	s/description c	f pollution	impacts:							
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 apropriate 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)	BIOTIC	EVALUATIC	N								
Fish observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? (Y/N)	Performed? (Y/N)	No	lf Yes, reco D number	ord all observ Include apro	ations. Vouch priate field da	er collections ta sheets from	optional. Note the Primary H	e: all vou leadwate	cher sample er Habitat As	s must be la sessment N	abeled with the site lanual.)
Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? (Y/N) Voucher? (Y/N)	Fish observed? (Y/N	J) V	oucher? (Y/N)	Salamar	iders observ	ed? (Y/N)		Voucher	? (Y/N)	
	Frogs or tadpoles ol	oserved? (Y/N)		Voucher? (Y/N)	Aquatic Mad	roinvertebra	tes obs	erved? (Y/N	1)	Voucher? (Y/N)

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


Stream S6S015i - facing downstream



Stream S6S015i - facing downstream

ChieEPA Primary Headwate	r Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 59
SITE NAME/LOCATION LINT & Sertor Ditch	
SITE NUMBER S6S015k RIVER	RASIN Indian Creek - Sand Cree DRAINAGE AREA (mi.) 0.137
LENGTH OF STEAM REACH (fft)	
DATE 10/28/2015 SCORER mr.dd COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Ev	aluation Manual for Obio's PHWH Streams" for Instructions
MODIFICATIONS:	
 SUBSTRATE (Estimate percent of every type of substrate (Max of 32). Add total number of significant substrate types for 	present Check ONLY two predominant substrate TYPE boxes und (Max of 8). Final metric score is sum of boxes A and B.)
	Metr
BLDR SLABS [16 pts] 0	SILT [3 pt] 0
BOULDER (>256 mm) [16 pts] 10	LEAF PACK/WOODY DEBRIS [3 pts] 0 Substra
COBBLE (65-256 mm) [9 pts 0	CLAY or HARDPAN [0 pts]
GRAVEL (2-64 mm) [9 pts] <u>30</u> SAND (<2 mm) [6 pts] <u>50</u>	MUCK [0 pts] 0 19
Total of Percentages of 10 00% (A)	Substrate Percentage Check 100 % (B) (A+B)
Bldr Slabs, Boulder, Cobble, Bedrock	
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES	15 TOTAL NUMBER OF SUBSTRATE TYPES 4
2. MAXIMUM POOL DEPTH (Measure the maximum pool de evaluation. Avoid plunge pools from road culverts or storm	Pool De water pipes)Pool De Max =
>>30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]
 ≥22.5 - 30 cm [30 pts] ≥10 - 22.5 cm [25 pts] 	No Water or Moist Channel [0 pts]
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 15
3. BANK FULL WIDTH (Measured as the average of a	3-4 measurements) (Check ONLY one box): Bankf
> 4.0 meters (>13') [30 pts]	✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Widt
>3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	□ <=1.0m (<=3'3") [5 pts]
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 1.6 15
This informatio	
RIPARIAN ZONE AND FLOODPLAIN QUALITY	NOTE: River left (L) and Right (R) as looking downstream
RIPARIAN WIDTH FLOODPLAIN QU	ALITY
L R (Per Bank L R (Most Pred	ominant Per Bank) L R
✓	rest, Wetland
Moderate 5-10 m ✓ ✓ Immature Narrow <5 m	Forest, Shrub or Old Field 🔄 🗌 Urban or Industrial
	asture Mining or Construction
Comments:	
FLOW REGIME (At time of evaluation) (Check ON	LY one box):
Steam flowing	Moist channel, isolated pools, no flow (Intermittent)
Subsurface now with isolated pools (interstitial) Comments:	✓ Dry channel, no water (Epnemeral)
SINUOSITY (Number of bonds per 64 m /200 ft) of ab	appal Chack ONLY and bay)
	$\square 2.0 \qquad \square 3.0$
	☐ 2.5 ✓ >3.0
STREAM GRADIENT ESTIMATE	
Flat (0.5 ft/100 ft) Flat to Moderate Moderate	e (2 ft/100 ft) 🗹 Moderate to Severe 🗌 Severe (10 ft /100 ft)

QHEI PEI	RFORMED	Yes 🖌 No	QHEI Score:	(If yes, att	ach completed QHEI for	m)	
DOWNST WWH Name: CWH Name: EWH Name:	REAM DESIGN	IATED USE(S)			Distance from Evaluate Distance from Evaluate Distance from Evaluate	ed Stream ed Stream	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION							
USGS Quadrangle I	Name: Martins	ville	NR	CS Soil Map Page:	48 NRCS Soil Map	Stream Order:	
County: Morgan			Township / C	ity: Washington			
MISCEL Base flow conditions Photograph informa	.LANEOUS s? (Y/N) <u>Yes</u> tion:	S Date of la	ast precipitation: 10	/27/2015	Quantity ().93	
Elevated Turbidity?	(Y/N) Yes	Canopy	(% open): 10)			
Were samples colle	cted for water c	_ hemistry? (Y/N)	No (Note la	b sample no. or id. an	d attach results) Lab nu	mber: N/A	
Field Measures:	Temp (C)	Dissolved	d oxygen (mg/l):	pH:	Conductivity (umho	s/cm):	
ls the sampling reac	h representativ	e of the stream?	(Y/N) Yes If n	ot, please explain:			
Additional comment	s/description of	pollution impacts	S:				
BIOTIC	EVALUATIO	N					
Performed? (Y/N)	No (li II	f Yes, record all ob) number. Include	servations. Voucher c apropriate field data sł	ollections optional. Note neets from the Primary H	: all voucher samples must eadwater Habitat Assessm	be labeled with the site ent Manual.)	
Fish observed? (Y/N	1) Vo	oucher? (Y/N)	Salamander	s observed? (Y/N)	Voucher? (Y/N))	
Frogs or tadpoles ol	oserved? (Y/N)	Vouche	r? (Y/N) Aqu	atic Macroinvertebrat	es observed? (Y/N)	Voucher? (Y/N)	
Comments Regardir	na Bioloav						



Stream S6S015k - facing downstream



Stream S6S015k - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 30	
SITE NAME/LOCATION UNT 8 Sartor Ditch	
SITE NUMBER S6S015m RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.).137
LENGTH OF STEAM REACH (ft) LAT 39.423012 LONG86.39908 RIVER CODE N/A RIVER MILE N/A	
DATE 10/28/2015 SCORER mr dd COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL VINNE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVER	RY
MODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.)	HEI
	etric
Image: Note of the second s	oints
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 Sul BEDROCK [16 pts] 0 Ma	bstrate ax = 40
COBBLE (65-256 mm) [9 pts 0 CLAY or HARDPAN [0 pts] 0	
✓ ✓ </td <td>15</td>	15
Total of Percentages of 0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPES 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)	ol Depti lax = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
 >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] ✓ No Water or Moist Channel [0 pts] 	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3 BANK EULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	lankfull
Statistical and a stread of the average of 5-4 measurements (choice of the solution of the solution). Statistical and solution of the average of 5-4 measurements (choice of the solution). Statistical and solution of the average of 5-4 measurements (choice of the solution). Statistical and solution of the average of 5-4 measurements (choice of the solution). Statistical and solution of the average of 5-4 measurements (choice of the solution). Statistical and solution. Statistica	Width
	ax = 30
COMMENTS:	15
This information must also be completed	
I R (Per Bank I R (Most Predominant Per Bank) I R	
Wide >10 m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10 m Immature Forest, Shrub or Old Field Urban or Industrial Narrow <5 m Residential Park New Field Open Pasture Row Crop	
✓ ✓ </td <td></td>	
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
 Steam 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 >3.0	
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)	

	ipiete
QHEI PERFORMED ☐ Yes ✔ No QHEI Score: (If yes	s, attach completed QHEI form)
DOWNSTREAM DESIGNATED USE(S)	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 A	AREA. CLEARLY MARK THE SITE LOCATION
JSGS Quadrangle Name: Martinsville NRCS Soil Map Page	e: 48 NRCS Soil Map Stream Order: 2
County: Morgan Township / City: Washington	1
MISCELLANEOUS	
Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015	Quantity 0.93
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open):	
Nere samples collected for water chemistry? (Y/N) No (Note lab sample no. or ic	d. and attach results) Lab number: N/A
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):
s the sampling reach representative of the stream? (Y/N) Yes If not, please explair	n:
Additional comments/description of pollution impacts:	
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. ID number. Include apropriate field data sheets from the Prima	ary Headwater Habitat Assessment Manual.)
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. ID number. Include apropriate field data sheets from the Prima Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N)	In Voucher samples must be labeled with the site ary Headwater Habitat Assessment Manual.) Voucher? (Y/N)

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





Stream S6S015m - facing upstream



Stream S6S015m - facing downstream

ChieEPA Primary Headwater H	Habitat Evaluation Form6HHEI Score (sum of metrics 1, 2, 3)
SITE NUMBER <u>S6SU150</u> RIVER BAS	SIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.13
	NG86.398806 RIVER CODE N/A RIVER MILE N/A
DATE 10/28/2015 SCORER ry COMMENT	
NOTE: Complete All items On This Form - Refer to "Field Evaluat	tion Manual for Onio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECO	OVERED RECOVERING ✓ RECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate pres (Max of 32). Add total number of significant subsrate types found	sentCheck ONLY two predominant substrate TYPE boxes (Max of 8). Final metric score is sum of boxes A and B.)
TYPE PERCENT TYPE	PERCENT POINTS
BLDR SLABS [16 pts]	
BOULDER (>256 mm) [16 pts] 0	FINE DETRITUS [3 pts] 0 Substrate Max = 40
COBBLE (65-256 mm) [9 pts ✓ ✓ GRAVEL (2-64 mm) [9 pts]	CLAY or HARDPAN [0 pts] 100 MUCK [0 pts] 0
SAND (<2 mm) [6 pts]	ARTIFICIAL [3 pts] 1
Total of Percentages of 0.00% (A) Bldr Slabs, Boulder, Cobble, Bedrock	Substrate Percentage 100 % (B) (A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 0	TOTAL NUMBER OF SUBSTRATE TYPES 1
2. MAXIMUM POOL DEPTH (Measure the maximum pool depth evaluation. Avoid plunge pools from road culverts or storm wate	within the 61 meter (200 ft)evaluation reach at the time of Pool Depth pr pipes) Max = 30
> >30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]
	 <5 cm [5 pts] № Water or Moist Channel [0 pts]
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0
3. BANK FULL WIDTH (Measured as the average of 3-4 i	measurements) (Check ONLY one box): Bankfull
> 4.0 meters (>13') [30 pts]	>1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Width Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 0.7 5
This information m	ust also be completed
	JTE: River left (L) and Right (R) as looking downstream
RIFARIAN WIDTH FLOODFLAIN QUALIT	int Par Park)
L R (Per Bank L R (Most Predomin	Wetland Conservation Tillage
Moderate 5-10 m	st, Shrub or Old Field Urban or Industrial
✓ ✓ Narrow <5 m ✓ ✓ Residential, Pa	e Deen Pasture, Row Crop
Comments:	<u> </u>
FLOW REGIME (At time of evaluation) (Check ONLY o	ne box):
 Steam flowing Subsurface flow with isolated pools (interstitial) 	 Moist channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)
None I 1 0	
	□ 2.5 □ >3.0
\square FIAL (0.5 T(100 T) \square FIAL to Moderate \square Moderate (21	IV 100 IL) ✓ Moderate to Severe Severe (10 It /100 It)

QHEI PERFORME	D 🗌 Yes	✓ No	QHEI Scoi	re:	(If yes, at	tach coi	mpleted QHI	El form)		
DOWNSTREAM D	ESIGNATED	USE(S)								
WWH Name: Sartor I	Ditch					Distar	ice from Eva	luated Stre	am	
CWH Name:						Distar	ice from Eva	luated Stre	am	
EWH Name:						Distar	ice from Eva	luated Stre	am	
MAPPING: ATTA	CH COPIES O	F MAPS, INCLUE	ING THE E	ENTIRE WATE	RSHED ARE	A. CLEA	RLY MARK T	HE SITE LO	CATION	
JSGS Quadrangle Name: Ma	artinsville			NRCS Soil N	/lap Page:	48	NRCS Soil	Map Strea	m Order:	2
County: Morgan			Townshi	o / City: Was	shington					
MISCELLANEO	us									
Base flow conditions? (Y/N)	No	Date of last pre	cipitation:	10/27/2015			Quantity	0.93		
Photograph information:							_			
Elevated Turbidity? (Y/N)	No	Canopy (% op	en):	100						
Were samples collected for w	ater chemist	ry? (Y/N)	No (No	te lab sample	e no. or id. a	nd attac	h results) La	b number:	N/A	
Field Measures: Temp (C	C)	Dissolved oxyg	en (mg/l):		pH:	Co	onductivity (u	mhos/cm):		
s the sampling reach represe	entative of the	e stream? (Y/N)	Yes	lf not, pleas	e explain:					
Additional comments/descript	tion of polluti	on impacts:								
BIOTIC EVALU	ATION									
Performed? (Y/N) No	(If Yes, re D numbe	ecord all observati er. Include apropr	ons. Voucl iate field da	her collections ata sheets from	optional. Note the Primary F	e: all vou leadwate	cher samples er Habitat Asse	must be labe essment Mar	eled with the s nual.)	ite
Fish observed? (Y/N)	Voucher	? (Y/N)	Salama	nders observ	ed? (Y/N)		Voucher?	(Y/N)		
Frogs or tadpoles observed?	(Y/N)	Voucher? (Y/	N)	Aquatic Mac	roinvertebra	tes obse	erved? (Y/N)	Vo	oucher? (Y/N	٩)





Stream S6S0150 - facing downstream



Stream S6S0150 - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)]
SITE NAME/LOCATION UNT 8 Sartor Ditch	
SITE NUMBER S6S015q RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.).123
LENGTH OF STEAM REACH (ft) LAT 39.425318 LONG RIVER CODE N/A RIVER MILE N/A	
DATE 10/28/2015 SCORER ry COMMENT	
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 RECOVER	RY
MODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.)	HEI
	letric
$\frac{11PE}{PERCENT} \qquad \frac{11PE}{0} \qquad Percent \qquad Pe$	oints
BOULDER (>256 mm) [16 pts] LEAF PACK/WOODY DEBRIS [3 pts] Sull LEAF PACK/WOODY DEBRIS [3 pts] LEAF PACK/WOODY [3 pts]	bstrate
BEDROCK [16 pts] 0 FINE DE IRITUS [3 pts] 0 Ma COBBLE (65-256 mm) [9 pts 0 CLAY or HARDPAN [0 pts] 0 Image: Comparison of the second	ax = 40
GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0	13
✓ SAND (<2 mm) [6 pts] 100 ARTIFICIAL [3 pts] 0	15
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B) (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPES 1	
 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) 	ol Depth lax = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
 ≥22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] ✓ No Water or Moist Channel [0 pts] 	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): B	Bankfull
→ 4.0 meters (>13') [30 pts] >1.0 m - 1.5m (>3'3" - 4'8") [15 pts]	Width
So m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	lax = 30
COMMENTS:	15
This information m <u>ust a</u> lso 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 >10 m ✓ Mature Forest, Wetland Conservation Tillage Moderate 5-10 m ✓ Immature Forest, Shrub or Old Field Urban or Industrial	
□ Narrow <5 m	
None Fenced Pasture Mining or Construction	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
 Steam nowing 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)	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	
STREAM GRADIENT ESTIMATE	
□ Flat (0.5 ft/100 ft) □ Flat to Moderate 🖌 Moderate (2 ft/100 ft) □ Moderate to Severe □ Severe (10 ft /100 ft)	

ADDITIONAL 51	REAM INF	ORMATIC	ON (I HIS INTO	ormation	must also	be complet	te			
QHEI PE	RFORMED	Yes	✓ No	QHEI Sco	re:	(If yes, atta	ach com	pleted QH	IEI form)	
DOWNS ⁻ WWH Name:	TREAM DES Sartor Dite	IGNATED	USE(S)				Distanc	e from Ev	aluated St	ream
CWH Name:							Distanc	e from Ev	aluated St	ream
EWH Name:							Distanc	e from Ev	aluated St	ream
MAPPIN	IG: ATTACH	COPIES OF	MAPS, INCLU	DING THE E	ENTIRE WATE	RSHED AREA	CLEAR	LY MARK	THE SITE I	OCATION
JSGS Quadrangle	Name: Mart	insville			NRCS Soil N	/lap Page:	48	NRCS So	il Map Str	eam Order:
County: Morgan				Townshi	o / City: Was	shington				
MISCE		5								
Base flow condition	ns? (Y/N)	No	Date of last pre	ecipitation:	10/27/2015			Quantity	0.93	
Photograph informa	ation:									
Elevated Turbidity?	' (Y/N) N	o	Canopy (% op	en):	10					
Were samples colle	ected for wate	er chemistr	y? (Y/N)	No (No	te lab sample	e no. or id. an	d attach	results) La	ab numbe	r: N/A
Field Measures:	Temp (C)		Dissolved oxyg	gen (mg/l):		pH:	Con	ductivity (umhos/cm	ı):
s the sampling rea	ch representa	ative of the	stream? (Y/N)	Yes	lf not, pleas	e explain:				
Additional commen	its/descriptior	n of pollutio	n impacts:							
BIOTIC	EVALUAT	ION								
Performed? (Y/N)	No	(If Yes, re ID numbe	cord all observat r. Include aprop	ions. Vouc riate field da	her collections ata sheets from	optional. Note: the Primary He	all vouch eadwater	ier samples Habitat Ass	s must be la sessment N	beled with the site lanual.)
Fish observed? (Y/I	N)	Voucher?	(Y/N)	Salama	nders observ	ed? (Y/N)		Voucher?	(Y/N)	
	$\frac{-}{(Y)}$	/N)	Voucher? (Y)	'N)	Aquatic Mac	roinvertebrate	es obser	ved? (Y/N)	Voucher? (Y/N)
Frogs or tadpoles o		,	(,	, iquallo mao				,	. ,



Stream S6S015q - facing downstream



Stream S6S015q - facing downstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 33]
SITE NAME/LOCATION UNT 8 Sartor Ditch SITE NUMBER S6S015r RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.1	102
LENGTH OF STEAM REACH (ft) LAT39.425986 LONGRIVER CODE RIVER MILE N/A RIVER MILE N/A	
DATE 10/28/2015 SCORER ry COMMENT	
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 RECOVER MODIFICATIONS:	ť٢
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) HI <u>TYPE</u> <u>PERCENT</u> <u>TYPE</u> <u>PERCENT</u> PERCENT	HEI etric pints
BLDR SLABS [16 pts] 0 SILT [3 pt] 0 <	strate (= 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B) (A)	λ+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPES 1	
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) Max	l Depth x = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts] >22.5 - 30 cm [30 pts] <5 cm [5 pts]	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bank > 4.0 meters (>13') [30 pts] >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] W > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m (<=3'3") [5 pts]	nkfull Vidth Ix = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.9	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 V Wide >10 m Mature Forest, Wetland Conservation Tillage Moderate 5-10 m Immature Forest, Shrub or Old Field Urban or Industrial Narrow <5 m	
FLOW REGIME (At time of evaluation) (Check ONLY one box): Steam flowing Moist channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (interstitial) ✓ Comments: Comments:	
SINUOSITY (Number of bends per 61 m (200 ft) of channel. Check ONLY one box) □ None □ 2.0 □ 3.0 □ 0.5 □ 1.5 ✓ 2.5 □ >3.0	
STREAM GRADIENT ESTIMATE □ Flat (0.5 ft/100 ft) □ Flat to Moderate ✓ Moderate (2 ft/100 ft) □ Moderate	

ADDITIONAL ST	REAM INF	ORMATIC	ON (This in	formation	must also	be complete				
QHEI PE	RFORMED	Yes	✓ No	QHEI Scor	e:	(If yes, attac	h complet	ed QHE	l form)	
	TREAM DES	IGNATED	USE(S)			-	N: 4			
WWH Name:	Sartor Dite	ch				L	Distance fro	om Eval	uated Str	eam
						L	Distance fro	om Eval	uated Str	ream
						L	distance tro	om Eval	uated Str	eam
MAPPIN	IG: АТТАСН	COPIES OF	MAPS, INCL	UDING THE E	NTIRE WATE	RSHED AREA.		MARK TH	HE SITE LO	OCATION
USGS Quadrangle	Name: Mart	insville			NRCS Soil N	lap Page: 4	8 NR	CS Soil	Map Stre	am Order: 1
County: Morgan				Township	o / City: Was	shington				
MISCEI	LLANEOUS	6								
Base flow condition	is? (Y/N)	No	Date of last p	recipitation:	10/27/2015		Qua	antity	0.93	
Photograph informa	ation:									
Elevated Turbidity?	(Y/N) N	0	Canopy (% o	open):	10					
Were samples colle	ected for wate	er chemistr	y? (Y/N)	No (No	te lab sample	no. or id. and	attach res	ults) Lal	o number	: N/A
Field Measures:	Temp (C)		Dissolved ox	ygen (mg/l):		рН:	Conduc	tivity (ur	mhos/cm)):
ls the sampling read	ch representa	ative of the	stream? (Y/I	N) Yes	lf not, pleas	e explain:				
Additional comment	ts/descriptior	n of pollutio	n impacts:							
BIOTIC	EVALUAT	ION								
Performed? (Y/N)	No	(If Yes, re ID numbe	cord all observ r. Include apro	ations. Vouch opriate field da	ner collections ta sheets from	optional. Note: a the Primary Hea	ll voucher s dwater Hab	amples r itat Asse	nust be lab ssment Ma	beled with the site anual.)
Fish observed? (Y/N	N)	Voucher?	(Y/N)	Salama	nders observ	ed? (Y/N)	Vou	ucher? (Y/N)	
Frons or tadpoles o	bserved? (Y/	′N)	Voucher? (Y/N)	Aquatic Mac	roinvertebrates	observed	? (Y/N)	\ \	/oucher? (Y/N)
riogs of taupoics o					•					



Stream S6S015r - facing upstream



Stream S6S015r - facing upstream

ChieEPA Primary Headwater	Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)34
SITE NAME/I OCATION LINT 8 Sartor Ditch	
SITE NUMBER S6S015s RIVER F	BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.05
LENGTH OF STEAM REACH (ft) LAT 39.426862 L	ONG86.398498 RIVER CODE N/A RIVER MILE N/A
DATE 10/28/2015 SCORER rv COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Eval	uation Manual for Ohio's PHWH Streams" for Instructions
MODIFICATIONS:	
 SUBSTRATE (Estimate percent of every type of substrate p (Max of 32). Add total number of significant subsrate types four 	nesentCheck ONLY two predominant substrate TYPE boxes nd (Max of 8). Final metric score is sum of boxes A and B.)
TYPE PERCENT TYP	
BLDR SLABS [16 pts]	
BOULDER (>256 mm) [16 pts] 0	LEAF PACK/WOODY DEBRIS [3 pts] 0 Substr
COBBLE (62-526 mm) [9 pts 2	CLAY or HARDPAN [0 pts]
✓ ✓ SAND (<2 mm) [6 pts] <u>98</u>	ARTIFICIAL [3 pts]
Total of Percentages of 2.00% (A) Bldr Slabs, Boulder, Cobble, Bedrock	Substrate Percentage 100 % (B) (A+E
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES	2 TOTAL NUMBER OF SUBSTRATE TYPES 2
 MAXIMUM POOL DEPTH (Measure the maximum pool dep evaluation. Avoid plunge pools from road culverts or storm w 	th within the 61 meter (200 ft)evaluation reach at the time of ater pipes) Max =
> >30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]
 ≥22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] 	 <5 cm [5 pts] ✓ No Water or Moist Channel [0 pts]
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0
3. BANK FULL WIDTH (Measured as the average of 3-	4 measurements) (Check ONLY one box): Bank
> 4.0 meters (>13') [30 pts]	□ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Wid
 >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] 	- <=1.0m (<=3'3") [5 pts]
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 1.6 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 QUA	LITY
L R (Per Bank L R (Most Predor	ninant Per Bank) L R
✓ ✓ Wide >10 m ✓ ✓ Mature Fore	est, Wetland Conservation Tillage
Narrow <5 m	Park, New Field Open Pasture, Row Crop
Commente:	ture Li Li Mining or Construction
FLOW REGIVE (At time of evaluation) (Check ONL)	r one pox):
Subsurface flow with isolated pools (interstitial)	 Dry channel, no water (Ephemeral)
Comments:	
SINUOSITY (Number of bends per 61 m (200 ft) of char	nnel. Check ONLY one box)
□ None □ 1.0 □ 0.5 □ 1.5	$\begin{array}{c c} 2.0 & \checkmark 3.0 \\ 2.5 & 3.0 \\ 3.0 \end{array}$
STREAM GRADIENT ESTIMATE	
Flat (0.5 ft/100 ft) Flat to Moderate Moderate	(2 ft/100 ft) V Moderate to Severe Severe (10 ft /100 ft)

QHEI PERFORMED Yes V No QHEI Score: (If ye	es, attach completed QHEI form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Sartor Ditch	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
JSGS Quadrangle Name: Martinsville NRCS Soil Map Page	ge: NRCS Soil Map Stream Order:
County: Morgan Township / City: Washingto	on
MISCELLANEOUS	
Base flow conditions? (Y/N) No Date of last precipitation: 10/27/2015	Quantity 0.93
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open): 5	
Nora complex collected for water chemistry? (Y/N)	id and attach regulte) Lab number:
Sield Measures: Temp (C) Dissolved oxygen (mg/l):	Conductivity (umbos/cm):
s the sampling reach representative of the stream? (Y/N) Yes If not, please expla	an:
Additional comments/description of pollution impacts:	
	Note: all variables appears must be labeled with the site
Performed ? (Y/N) NO (If Yes, record all observations. Voucher collections optional.	nary Headwater Habitat Assessment Manual.)
ID number. Include apropriate field data sheets from the Finn	N) Voucher? (Y/N)
Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/	
Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed?	tebrates observed? (Y/N) Voucher? (Y/N)
Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/I) Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvert	tebrates observed? (Y/N) Voucher? (Y/N)



NM Meture Forest



Stream S6S015s - facing upstream



Stream S6S015s - facing downstream

Stream S6S016



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 7 Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.075 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	2
IDEM 303(d) Listed:	No	Quarter:	NW
USACE Jurisdiction	Yes	Latitude:	39.422144
IDEM Jurisdiction:	Yes	Longitude:	-86.399556

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S016a	Ephemeral	Roadside Ditch	3.00	0.30	HHEI = 16	148	0.01	0.11
Total						148	0.01	0.11

* Includes both permanent and temporary impacts

Approximately 148 feet (0.01 acre) of the captured roadside channel will be relocated into a proposed new captured roadside channel. The OHWM of the UNT 7 to Sartor Ditch averages 3.0 feet wide by 0.5 feet deep. The new proposed relocated channel will consist of at least 148 feet (0.01 acre) of open natural bottom channel. The stream relocation will not result in any loss of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.



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

16

SITE NAME/LOCATION UNT 7 Sartor Ditc	h	
SITE NUMBER S	6S016a RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.075
LENGTH OF STEAM REACH (ft)	LAT 39.422144 LONG86.399556 RIVER CODE N/A RIVER MILE	N/A
DATE 10/28/2015 SCORER mr dd	COMMENT	
NOTE: Complete All Items On This Form	- Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL NONE / NATUR MODIFICATIONS:	RAL CHANNEL 🗌 RECOVERED 🗹 RECOVERING 🗌 RECENT OR NO RE	COVERY
1. SUBSTRATE (Estimate percent of ev (Max of 32). Add total number of signif	ery type of substrate presentCheck ONLY two predominant substrate TYPE boxes icant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	HHEI Metric
	PERCENT TYPE PERCENT	Points
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pts] COBBLE (65-256 mm) [9 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts]	0 SIL I [3 pt] 25 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 0 FINE DETRITUS [3 pts] 0 0 CLAY or HARDPAN [0 pts] 0 0 MUCK [0 pts] 0 75 ARTIFICIAL [3 pts] 0	Substrate Max = 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SU	JBSTRATE TYPES 9 TOTAL NUMBER OF SUBSTRATE TYPES 2	
2. MAXIMUM POOL DEPTH (Measure to evaluation. Avoid plunge pools from the evaluation of the plunge pools from	he maximum pool depth within the 61 meter (200 ft)evaluation reach at the time of oad culverts or storm water pipes)	Pool Depti Max = 30
 >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] 	0
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0	
Source Second product with the second	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m None Comments:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <	Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m None Comments: FLOW REGIME (At time of etc) Steam flowing Subsurface flow with isolated poor Comments:	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Image: Conservation of the state	Bankfull Width Max = 30 5
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH L R (Per Bank ✓ Wide >10 m Moderate 5-10 m None Comments: FLOW REGIME (At time of explanation of the state of th	MAXIMUM POOL DEPTH (centimeters): 0 as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30

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DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch	QHEI PEI	RFORMED	🗌 Yes 🖌 No	QHEI Score:	(If yes, att	ach completed QHEI fo	orm)
MAPPING:	DOWNST WWH Name: CWH Name:	REAM DESIGI	VATED USE(S)			Distance from Evalua Distance from Evalua	ted Stream
USGS Quadrangle Name: Martinsville NRCS Soil Map Page: 48 NRCS Soil Map Stream Order: County: Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	EWH Name:	G: ATTACH CO			E WATERSHED AREA		
Morgan Township / City: Washington MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	USGS Quadrangle I	Name: Martins	ville	NRC	CS Soil Map Page:	48 NRCS Soil Ma	ap Stream Order:
MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015 Quantity 0.93 Photograph information:	County: Morgan			Township / Ci	ty: Washington		
Elevated Turbidity? (Y/N) No Canopy (% open): 10 Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): If Is the sampling reach representative of the stream? (Y/N) Yes 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 in D number. Include apropriate 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)	MISCEL Base flow conditions Photograph informa	-LANEOUS s? (Y/N) Yes tion:	s Date of la	ist precipitation: <u>10/</u>	27/2015	Quantity	0.93
Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id. and attach results) Lab number: N/A Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm):	Elevated Turbidity?	(Y/N) No	Canopy	(% open): 10			
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH: Conductivity (umhos/cm): Is the sampling reach representative of the stream? (Y/N) Yes 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 apropriate 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)	Were samples colle	cted for water c	hemistry? (Y/N)	No (Note lat	o sample no. or id. an	d attach results) Lab n	umber: N/A
Is the sampling reach representative of the stream? (Y/N) Yes_ If not, please explain: Additional comments/description of pollution impacts:	Field Measures:	Temp (C)	Dissolved	l oxygen (mg/l):	pH:	Conductivity (umh	os/cm):
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 apropriate 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)	ls the sampling reac	h representativ	e of the stream?	(Y/N) Yes If n	ot, please explain:		
BIOTIC EVALUATION Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. Note: all voucher samples must be labeled with the sit ID number. Include apropriate 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)	Additional comment	s/description of	pollution impacts				
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. Note: all voucher samples must be labeled with the sit ID number. Include apropriate 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)	BIOTIC	EVALUATIO	N				
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)	Performed? (Y/N)	No (I	f Yes, record all obs D number. Include	servations. Voucher co apropriate field data sh	ollections optional. Note eets from the Primary H	: all voucher samples mus eadwater Habitat Assessn	at be labeled with the site nent Manual.)
Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates observed? (Y/N) Voucher? (Y/N)	Fish observed? (Y/N	1) Vo	oucher? (Y/N)	Salamanders	s observed? (Y/N)	Voucher? (Y/N	۱)
	Frogs or tadpoles of	oserved? (Y/N)	Vouche	r? (Y/N) Aqu	atic Macroinvertebrat	es observed? (Y/N)	Voucher? (Y/N)



Stream S6S016a - facing upstream



Stream S6S016a - facing upstream

Stream S6S019



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 10 Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.042 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	3
IDEM 303(d) Listed:	No	Quarter:	NE
USACE Jurisdiction	Yes	Latitude:	39.423012
IDEM Jurisdiction:	Yes	Longitude:	-86.405202

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S019a	Ephemeral	Roadside Ditch	5.00	0.70	HHEI = 50	452	0.05	0.38
Total						452	0.05	0.38

* Includes both permanent and temporary impacts

Approximately 452 feet (0.052 acre) of the roadside channel UNT 10 to Sartor Ditch will be relocated. The OHWM of the UNT 10 to Sartor Ditch at this location is 5.0 feet wide by 0.7 feet deep. The proposed new relocated UNT 10 to Sartor Ditch includes at least 452 feet (0.052 acre) of open natural bottom channel. This relocation will not result in the loss of any stream length.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.

Primary Headwater Habitat Evaluation Form

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

50

SITE NAME/LOCATION UNT 10 Sartor Dite	n			
SITE NUMBER S6	S019a RIVER BASIN Indi	an Creek - Sand Cree DRAIN	AGE AREA (mi)	0.042
LENGTH OF STEAM REACH (ft)	LAT 39.423012 LONG86	6.405202 RIVER CODE N/A	RIVER MILE N/A	
DATE 10/28/2015 SCORER mr dd	COMMENT			
NOTE: Complete All Items On This Form	Refer to ""Field Evaluation Mar	ual for Ohio's PHWH Streams	" for Instructions	
STREAM CHANNEL NONE / NATUR.	L CHANNEL 🔲 RECOVERED		ECENT OR NO RECOV	ERY
1. SUBSTRATE (Estimate percent of ever (Max of 32). Add total number of signific	ry type of substrate presentChe ant subsrate types found (Max of	ck ONLY two predominant subs 8). Final metric score is sum of	trate TYPE boxes boxes A and B.)	HHEI Aetric
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pts] COBBLE (65-256 mm) [9 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts]	0 IIIE	3 pt] PACK/WOODY DEBRIS [3 pts] DETRITUS [3 pts] or HARDPAN [0 pts] [0 pts] ICIAL [3 pts]	0 S 0 N 0 N 0 10	ubstrate lax = 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	.00% (A) Subst	ate Percentage 100 %	(B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SU	BSTRATE TYPES 12 TO	TAL NUMBER OF SUBSTRATI	TYPES 3	
2. MAXIMUM POOL DEPTH (Measure the evaluation. Avoid plunge pools from response of the evaluation.	e maximum pool depth within t ad culverts or storm water pipes)	ne 61 meter (200 ft)evaluation r	each at the time of	ool Depti Max = 30
 >30 centimeters [20 pts] >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] 	 ✓ >5 0 <5 0 <5 0 No 	cm - 10 cm [15 pts] cm [5 pts] Water or Moist Channel [0 pts]		15
A A MULTINE	_			
	N	IAXIMUM POOL DEPTH (cent	meters): 10	
3. BANK FULL WIDTH (Measured at 2000) > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] ✓ > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	s the average of 3-4 measur	ements) (Check ONLY one) m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts]	box):	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured at a structure of the structure	s the average of 3-4 measur -1.1 	IAXIMUM POOL DEPTH (cent ements) (Check ONLY one om - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts] VERAGE BANKFULL WIDTH	(Meters): 1.5	Bankfull Width Max = 30 20
3. BANK FULL WIDTH (Measured at 2000) > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] ✓ > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	s the average of 3-4 measur 	IAXIMUM POOL DEPTH (cent ements) (Check ONLY one) m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts] VERAGE BANKFULL WIDTH be completed	(Meters): 10 (Meters): 1.5	Bankfull Width Max = 30 20
3. BANK FULL WIDTH (Measured at 2000) > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	s the average of 3-4 measur >1.(>1.(<=1) A This information must also ANN QUALITY NOTE: Riv	IAXIMUM POOL DEPTH (cent ements) (Check ONLY one 0 m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts] VERAGE BANKFULL WIDTH be completed er left (L) and Right (R) as look	(Meters): 1.5	Bankfull Width Max = 30 20
3. BANK FULL WIDTH (Measured at 2 + 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] ✓ >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	s the average of 3-4 measur > 1.(> 1.(< = 1 A This information must also AIN QUALITY NOTE: Riv FLOODPLAIN QUALITY	IAXIMUM POOL DEPTH (cent ements) (Check ONLY one 0 m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts] VERAGE BANKFULL WIDTH be completed er left (L) and Right (R) as look	(Meters): 10 (Meters): 1.5	Bankfull Width Max = 30 20
3. BANK FULL WIDTH (Measured at 2000) > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Wide >10 m Wide >10 m Moderate 5-10 m None Comments: immature forest with	s the average of 3-4 measur s the average of 3-4 measur >1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<pre>>1.(<p< td=""><td>IAXIMUM POOL DEPTH (cent ements) (Check ONLY one 0 m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts]</td> VERAGE BANKFULL WIDTH be completed er left (L) and Right (R) as look Bank) L R or Old Field Urban Field Open</p<></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>	IAXIMUM POOL DEPTH (cent ements) (Check ONLY one 0 m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts]	(Meters): 1.5 (Meters): 1.5 ng downstream rvation Tillage or Industrial Pasture, Row Crop or Construction	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured at > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>97" - 13') [25 pts] >1.5 m - 3.0 m(>97" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m None Comments: Immature forest with FLOW REGIME (At time of eval Steam flowing Subsurface flow with isolated pool Comments: SINUOSITY (Number of bends r	s the average of 3-4 measur s the average of 3-4 measur >1.(<=1 A This information must also AIN QUALITY NOTE: Riv FLOODPLAIN QUALITY L R (Most Predominant Per Mature Forest, Wetlance Immature Forest, Vetlance Immature Forest,	IAXIMUM POOL DEPTH (cent ements) (Check ONLY one 0 m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts]	meters): 10 box): (Meters): 1.5 (Meters): 1.	Bankfull Width Max = 30 20
3. BANK FULL WIDTH (Measured at > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Wide >10 m Moderate 5-10 m None Comments: Immature forest with FLOW REGIME (At time of eval Steam flowing Subsurface flow with isolated pool Comments: SINUOSITY (Number of bends p None Image: None	s the average of 3-4 measur s the average of 3-4 measur >1.(<=1 A This information must also AIN QUALITY NOTE: Riv FLOODPLAIN QUALITY L R (Most Predominant Per Mature Forest, Wetland Immature Forest, Wetland Immature Forest, Shrut Residential, Park, New Fenced Pasture in r/w Iuation) (Check ONLY one box): i (interstitial)	IAXIMUM POOL DEPTH (cent ements) (Check ONLY one 0 m - 1.5m (>3'3" - 4'8") [15 pts] .0m (<=3'3") [5 pts]	imeters): 10 box):	Bankfull Width Max = 30 20

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QHEI PERFORMEL) 🗌 Yes ✔ No	QHEI Score:	(If yes, attach co	ompleted QHEI for	m)
DOWNSTREAM DE	SIGNATED USE(S)				
WWH Name: Sartor D	itch		Dista	nce from Evaluate	d Stream
CWH Name:			Dista	nce from Evaluate	d Stream
EWH Name:			Dista	nce from Evaluate	d Stream
MAPPING: ATTAC	H COPIES OF MAPS, INC	CLUDING THE ENTIRE WAT	RSHED AREA. CLE	ARLY MARK THE SI	TE LOCATION
ISGS Quadrangle Name: Ma	ırtinsville	NRCS Soil	Map Page: 48	NRCS Soil Map	Stream Order:
ounty: Morgan		Township / City: Wa	shington		
MISCELLANEO	US				
ase flow conditions? (Y/N)	Yes Date of las	t precipitation: 10/27/201	;	Quantity 0	.93
hotograph information:					
levated Turbidity? (Y/N)	No Canopy (%	% open): 10			
Vere samples collected for wa	ater chemistry? (Y/N)	No (Note lab sampl	e no. or id. and atta	ch results) Lab nur	nber: N/A
ield Measures: Temp (C) Dissolved	oxygen (mg/l):	pH: C	onductivity (umhos	s/cm):
s the sampling reach represe	ntative of the stream? (Y/N) Yes If not, plea	se explain:		
dditional comments/descripti	on of pollution impacts:				
BIOTIC EVALUA					
Performed? (Y/N) No	(If Yes, record all obso	ervations. Voucher collections	optional. Note: all vo	ucher samples must l	be labeled with the site
	D number. Include a	propriate field data sheets fror	n the Primary Headwa	ter Habitat Assessme	nt Manual.)
ish observed? (Y/N)	Voucher? (Y/N)	Salamanders observ	ved? (Y/N)	Voucher? (Y/N)	
· · · · ·		? (Y/N) Aquatic Ma	croinvertebrates ob	served? (Y/N)	Voucher? (Y/N)
rogs or tadpoles observed? (

DRAWING AMD NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Stream S6S019a - facing upstream



Stream S6S019a - facing upstream

Stream S6S020



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 11 Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T11N
Drainage area:	0.005 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	3
IDEM 303(d) Listed:	No	Quarter:	NE
USACE Jurisdiction	Yes	Latitude:	39.423002
IDEM Jurisdiction:	Yes	Longitude:	-86.40416

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S020a	Ephemeral	Roadside Ditch	4.17	0.27	HHEI = 35	463	0.04	0.22
Total						463	0.04	0.22

* Includes both permanent and temporary impacts

Approximately 463 feet (0.045 acre) of the roadside channel UNT 11 to Sartor Ditch will be relocated. The OHWM for this location of the UNT 11 to Sartor Ditch is 4.2 feet wide by 0.3 feet deep. The new relocated UNT 11 to Sartor Ditch channel includes a minimum of 463 feet (0.045 acre) of open natural bottom channel. This relocation will not result in the loss of any stream length.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. This stream is being considered restored on-site and no mitigation is being offered for the impact to this stream.

Primary Headwater Habitat Evaluation Form

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

35

SITE NAME/LOCATION UNT 11 Sartor Dite	h	
SITE NUMBER S6	S020a RIVER BASIN Indian Creek - Sand Cree DRAINAGE	E AREA (mi) 0.005
LENGTH OF STEAM REACH (ft)	LAT 39.423002 LONG86.40416 RIVER CODE N/A	RIVER MILE N/A
DATE 10/28/2015 SCORER mr dd	COMMENT	
NOTE: Complete All Items On This Form	Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for	r Instructions
STREAM CHANNEL NONE / NATUR.	AL CHANNEL 🗹 RECOVERED 🗌 RECOVERING 🗌 RECE	ENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of ever (Max of 32). Add total number of signific	ry type of substrate present Check ONLY two predominant substrate ant subsrate types found (Max of 8). Final metric score is sum of boxe	e TYPE boxes es A and B.) HHEI Metric
	ERCENT TYPE P	ERCENT Points
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pts] COBBLE (65-256 mm) [9 pts] GRAVEL (2-64 mm) [9 pts] ✓ SAND (<2 mm) [6 pts]	0 SILT [3 pt] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 FINE DETRITUS [3 pts] 0 CLAY or HARDPAN [0 pts] 5 MUCK [0 pts] 85 ARTIFICIAL [3 pts]	10 Substrate 0 Max = 40 0 15
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	0.00% (A) Substrate Percentage 100 %	(B) (A+B)
SCORE OF TWO MOST PREDOMINATE SU	BSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPE	PES 3
2. MAXIMUM POOL DEPTH (Measure the evaluation. Avoid plunge pools from response of the evaluation.	e maximum pool depth within the 61 meter (200 ft)evaluation reach ad culverts or storm water pipes)	n at the time of Pool Dept Max = 30
 >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] 	5
COMMENTS:	MAXIMUM POOL DEPTH (centimete	ers): 4
Source Second Provided Hyperbolic 3. BANK FULL WIDTH (Measured Hyperbolic 3.0 > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	As the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Bankfull Width Max = 30
COMMENTS: 3. BANK FULL WIDTH (Measured at 2000 at 20000 at 2000 at 20000 at 2000 at 20000 at 20000 at 2000 at 2000 at 20000 at 2000 at 2000 at	As the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meter	ers): 4 Bankfull Width Max = 30 ters): 1.3
Source Second Provided Hyperbolic 3. BANK FULL WIDTH (Measured Hyperbolic) 3.0 > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 COMMENTS:	MAXIMUM POOL DEPTH (centimeter as the average of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meter This information must also be completed	ers): 4 Bankfull Width Max = 30 ters): 1.3
COMMENTS: 3. BANK FULL WIDTH (Measured at 2 a 2 a 2 a 2 a 2 a 2 a 2 a 2 a 2 a	MAXIMUM POOL DEPTH (centimeter as the average of 3-4 measurements) (Check ONLY one box): Image: State of the sta	ers): 4 Bankfull Width Max = 30 ers): 1.3 Iownstream
COMMENTS: 3. BANK FULL WIDTH (Measured at a standard between stand	MAXIMUM POOL DEPTH (centimeter as the average of 3-4 measurements) (Check ONLY one box): Image: State of the sta	ers): 4 Bankfull Width Max = 30 ters): 1.3 Ibownstream
COMMENTS: 3. BANK FULL WIDTH (Measured at 2 > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Wide >10 m None Comments:	MAXIMUM POOL DEPTH (centimetal as the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of t	ers): 4 Bankfull Width Max = 30 Lers): 1.3 Iownstream
COMMENTS: 3. BANK FULL WIDTH (Measured at 2 > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>97" - 13') [25 pts] >1.5 m - 3.0 m(>97" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Wide >10 m Wide >10 m Moderate 5-10 m None Comments: FLOW REGIME (At time of evaluation of the flow with isolated pool Comments:	MAXIMUM POOL DEPTH (centimetal as the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of t	ters): 4 : Bankfull Width Max = 30 ters): 1.3 ters): 1.3 downstream ion Tillage industrial ure, Row Crop Construction low (Intermittent))
COMMENTS: 3. BANK FULL WIDTH (Measured at 2 > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	MAXIMUM POOL DEPTH (centimetal as the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of 3-4 measurements) (Check ONLY one box): Image: State of the average of t	ers): 4 Bankfull Width Max = 30 ers): 1.3 15 Nownstream ion Tillage ndustrial ure, Row Crop Construction low (Intermittent)

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	ipiete
QHEI PERFORMED Ves Vo QHEI Score: (If yes	s, attach completed QHEI form)
DOWNSTREAM DESIGNATED USE(S) WWH Name: Sartor Ditch	Distance from Evaluated Stream
	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED A	AREA. CLEARLY MARK THE SITE LOCATION
ISGS Quadrangle Name: Martinsville NRCS Soil Map Page	e: 48 NRCS Soil Map Stream Order: 0
County: Morgan Township / City: Washington	n
Base flow conditions? (Y/N) Yes Date of last precipitation: 10/27/2015	Quantity 0.93
hotograph information:	
levated Turbidity? (Y/N) No Canopy (% open):	
Vere samples collected for water chemistry? (Y/N) No (Note lab sample no. or ic	d. and attach results) Lab number: N/A
ield Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):
s the sampling reach representative of the stream? (Y/N) Yes If not, please explair	n:
dditional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. ID number. Include apropriate field data sheets from the Prima	Note: all voucher samples must be labeled with the site ary Headwater Habitat Assessment Manual.)
ish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N	N) Voucher? (Y/N)
	(1, 1, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3,
rogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverte	ebrates observed? (Y/N) Voucher? (Y/N)

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





Stream S6S020a - facing downstream



Stream S6S020a - facing downstream

Stream S6S021



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	Sartor Ditch	Quadrangle:	Martinsville
Basin:	Indian Creek - Sand Creek	County:	Morgan
14-digit HUC:	05120201170070	Township:	T12N
Drainage area:	0.214 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	34
IDEM 303(d) Listed:	No	Quarter:	SE
USACE Jurisdiction	Yes	Latitude:	39.42817
IDEM Jurisdiction:	Yes	Longitude:	-86.407514

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S021a	Ephemeral	Natural	3.50	1.17	HHEI = 58	0	0.00	0.00
S6S021b	Ephemeral	Culvert	4.00	0.70	N/A	0	0.00	0.00
S6S021c	Ephemeral	Natural	4.00	0.70	HHEI = 60	0	0.00	0.00
S6S021d	Ephemeral	Natural	4.17	0.80	HHEI = 68	343	0.03	0.34
Total						343	0.03	0.34

* Includes both permanent and temporary impacts

Approximately 85 feet (0.008 acre) of Sartor Ditch will be relocated downstream of a residential driveway culvert. The existing culvert will be relocated, resulting in the relocation of the existing roadside channel. The OHWM for this location of the Sartor Ditch is 4.2 feet wide by 0.8 feet deep. The new relocated Sartor Ditch channel includes 85 feet (0.008) of open natural bottom channel and 8 feet (0.001 acre) of revetment riprap for scour protection. The existing 29 feet long by 18-inch-wide diameter CMP structure that carries a residential driveway over Sartor Ditch will be replaced with 29 feet long by 18-inch reinforced concrete pipe (RCP) (Structure P560). This relocation will not result in the loss of any stream length.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and vegetated prior to release of water into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be returned to natural bank contours. Sideslopes will be stabilized with coir fiber matting and planted with a native bank stabilization seed mix. For reference see the Slope Stabilization Seed Mix included in Attachment 10. This stream is being considered restored on-site and no mitigation is being offered for the impacts to this stream.

Primary Headwater Habitat Evaluation Form

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

58

SITE NAME/LOCATION Sartor Ditch			
SITE NUMBER SE	S021a RIVER BA	SIN Indian Creek - Sand Cree DRAIN	AGE AREA (mi) 0.214
LENGTH OF STEAM REACH (ft)	LAT 39.42817 LO	NG86.407514 RIVER CODE N/A	RIVER MILE N/A
DATE 10/27/2015 SCORER _mr dd	COMMENT		
NOTE: Complete All Items On This Form	- Refer to ""Field Evalua	ation Manual for Ohio's PHWH Streams	s" for Instructions
STREAM CHANNEL NONE / NATUR MODIFICATIONS:	AL CHANNEL 🗹 REC	OVERED 🗌 RECOVERING 🗌 R	ECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of eve (Max of 32). Add total number of signifi	ery type of substrate pre cant subsrate types found	esentCheck ONLY two predominant subs d (Max of 8). Final metric score is sum of	trate TYPE boxes boxes A and B.) HHEI Metric
	ERCENT TYPE	011 T 12 - 41	PERCENT Points
□ BLDR SLABS [16 pts] □ BOULDER (>256 mm) [16 pts] □ BEDROCK [16 pts] □ COBBLE (65-256 mm) [9 pts] □ GRAVEL (2-64 mm) [9 pts] ✓ SAND (<2 mm) [6 pts]	0 - 0 - 0 - 0 - 30 - 60 -	SIL I [3 pt] LEAF PACK/WOODY DEBRIS [3 pts] FINE DETRITUS [3 pts] CLAY or HARDPAN [0 pts] MUCK [0 pts] ARTIFICIAL [3 pts]	0 Substrate 0 Max = 40 0 10
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	0.00% (A)	Substrate Percentage 100 %	(B) (A+B)
SCORE OF TWO MOST PREDOMINATE SU	BSTRATE TYPES 15	TOTAL NUMBER OF SUBSTRATE	E TYPES 3
2. MAXIMUM POOL DEPTH (Measure the evaluation. Avoid plunge pools from r	he maximum pool depth oad culverts or storm wat	n within the 61 meter (200 ft)evaluation r er pipes)	each at the time of Max = 30
 >>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] 	25
		MAXIMUM POOL DEPTH (cent	imeters): 20
Solution Solution 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	as the average of 3-4	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	imeters): 20 box): Bankful Width Max = 30
Second Entremponent 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	as the average of 3-4	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH	imeters): 20 box): Bankfull Width Max = 30 (Meters): 1.1
Second Entremain Second Entremain 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	as the average of 3-4	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH wust also be completed	imeters): 20 box): Bankful Width Max = 30 (Meters): 1.1
Second Entries 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	as the average of 3-4 This information m	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one ≥1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ≤=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH Must also be completed IOTE: River left (L) and Right (R) as lookid	imeters): 20 box): Bankfull Width Max = 30 (Meters): 1.1 15
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	as the average of 3-4 This information m LAIN QUALITY N FLOODPLAIN QUALI	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH must also be completed IOTE: River left (L) and Right (R) as lookid ITY	imeters): 20 box): Bankfull Width Max = 30 (Meters): 1.1 15
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	As the average of 3-4 This information m LAIN QUALITY FLOODPLAIN QUALI L R (Most Predomi L R (Most Predomi Mature Forest Immature Fore Residential, P Fenced Pastu	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one >1.0 m - 1.5m (>3'3" - 4'8") >1.0 m - 1.5m (>3'3" - 4'8") >1.0 m - 1.5m (>3'3" - 4'8") >10 m - 1.5m (>3'3" - 4'8") >10 m - 1.5m (>3'3" - 4'8") >10 m - 1.5m (>3'3" - 4'8") >15 pts] AVERAGE BANKFULL WIDTH Dust also be completed IOTE: River left (L) and Right (R) as lookid ITY nant Per Bank) L R t, Wetland Conse est, Shrub or Old Field Urban re Mining	imeters): 20 box): Bankfull Width Max = 30 (Meters): 1.1 15 ing downstream ervation Tillage or Industrial Pasture, Row Crop or Construction
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	as the average of 3-4 This information model This information model L R FLOODPLAIN QUALITY N L R Mature Forest Immature Forest Immature Forest Residential, P Second Pasture Fenced Pasture aluation) (Check ONLY of the second past)	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] AVERAGE BANKFULL WIDTH AVERAGE BANKFULL WIDTH AVERAGE BANKFULL WIDTH OUST also be completed JOTE: River left (L) and Right (R) as lookid ITY nant Per Bank) L R t, Wetland est, Shrub or Old Field ark, New Field re One box): Moist channel, isolated pools, J ry channel, no water (Epherr	imeters): 20 box): Bankfull Width Max = 30 (Meters): 1.1 15 ing downstream ervation Tillage or Industrial Pasture, Row Crop or Construction no flow (Intermittent) heral)
COMMENTS: 3. BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	as the average of 3-4 This information m L R (Most Predomi L R (Most Predomi Mature Forest Immature Forest Imma	MAXIMUM POOL DEPTH (cent measurements) (Check ONLY one >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH must also be completed NOTE: River left (L) and Right (R) as looking ITY nant Per Bank) L R t, Wetland □ Consect t, Wetland □ Open track, New Field ○ Open one box): □ Moist channel, isolated pools, Image: Consect of the section of the s	imeters): 20 box): Bankfull Width Max = 30 (Meters): 1.1 15 ing downstream revation Tillage or Industrial Pasture, Row Crop or Construction no flow (Intermittent) a.0 >3.0 >3.0

Chie EPA

ADDITIONAL 31	REAM INFORMATION (This information must	also be complete
QHEI PE	RFORMED Yes V No QHEI Score:	(If yes, attach completed QHEI form)
DOWNS	REAM DESIGNATED USE(S) Sartor Ditch	Distance from Evaluated Stream
CWH Name:		Distance from Evaluated Stream
EWH Name:		Distance from Evaluated Stream
MAPPIN	G: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE	WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle	Name: Martinsville NRCS	Soil Map Page: 42 NRCS Soil Map Stream Order: 2
County: Morgan	Township / City:	Washington
MISCE	LANEOUS	
Base flow condition	s? (Y/N) No Date of last precipitation: 10/27	/2015 Quantity 0.93
Photograph informa	tion:	
Elevated Turbidity?	(Y/N) No Canopy (% open): 95	
Were samples colle	cted for water chemistry? (Y/N) No (Note lab s	ample no. or id. and attach results) Lab number: N/A
Field Measures:	Temp (C) Dissolved oxygen (mg/l):	pH: Conductivity (umhos/cm):
s the sampling rea	h representative of the stream? (Y/N) Yes If not,	please explain:
Additional commen	s/description of pollution impacts:	
BIOTIC	EVALUATION	
Performed? (Y/N)	No (If Yes, record all observations. Voucher colle ID number. Include apropriate field data shee	ctions optional. Note: all voucher samples must be labeled with the site ts from the Primary Headwater Habitat Assessment Manual.)
Fish observed? (Y/I	 Voucher? (Y/N) Salamanders of 	bserved? (Y/N) Voucher? (Y/N)
	oserved? (Y/N) Voucher? (Y/N) Aquati	c Macroinvertebrates observed? (Y/N) Voucher? (Y/N)
Frogs or tadpoles o		



Stream S6S021a - facing downstream



Stream S6S021a - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	60									
SITE NAME/LOCATION Sartor Ditch										
SITE NUMBER S6S021c RIVER BASIN Indian Creek - Sand Cree DRAINAGE AREA (mi)	0.212									
LENGTH OF STEAM REACH (ft) LAT 39.428684 LONG86.406244 RIVER CODE N/A RIVER MILE	N/A									
DATE 10/27/2015 SCORER mr dd COMMENT										
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 REMODIFICATIONS:	ECOVERY									
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	HHEI									
TYPE PERCENT TYPE PERCENT	Metric									
	Fonts									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Substrate Max = 40									
COBBLE (65-256 mm) [9 pts 0 CLAY or HARDPAN [0 pts] 0 GRAVEL (2-64 mm) [9 pts] 5 MUCK [0 pts] 0										
✓ SAND (<2 mm) [6 pts]	15									
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	(A+B)									
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 12 TOTAL NUMBER OF SUBSTRATE TYPES 3										
 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) 	Pool Dept Max = 30									
>>30 centimeters [20 pts]										
✓ >22.5 - 30 cm [30 pts] <5 cm [5 pts]	30									
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 23										
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull									
	Width Max = 30									
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]										
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.2	15									
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 >10 m Ature Forest, Wetland Conservation Tillage										
✓ Moderate 5-10 m ✓ Moderate 5-10 m ✓ Marrow <5 m Residential, Park, New Field Open Pasture, Row Crop	J									
None Fenced Pasture Mining or Construction										
Comments:										
FLOW REGIME (At time of evaluation) (Check ONLY one box):	-4)									
□ Steam nowing ■ Noise channel, isolated pools, no now (internitient) □ Subsurface flow with isolated pools (interstitial) ✓ Dry channel, no water (Ephemeral)	it <i>)</i>									
SINI IOSITY (Number of bends per 61 m (200 ft) of chappel Check ONLY and box)										
None 1.0 \checkmark 2.0 3.0										
□ 0.5 □ 1.5 □ 2.5 □ >3.0										
STREAM GRADIENT ESTIMATE ☐ Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft)	′100 ft)									
ADDITIONAL 51	REAM INFO	ORMATIC	DN (I NIS INTO	ormation	must also	be complet	e			
---------------------	----------------	---------------------------	-------------------------------------	--------------------------------	------------------------------------	-----------------------------------	----------------------	---------------------------	----------------------------	---------------------------------
QHEI PE	RFORMED	Yes	✓ No	QHEI Sco	re:	(If yes, atta	ach com	pleted QH	IEI form)	
DOWNS	TREAM DES	IGNATED	USE(S)				Distanc	e from Ev	aluated St	tream
CWH Name:							Distanc	e from Ev	aluated St	tream
EWH Name:							Distanc	e from Ev	aluated St	tream
MAPPIN	IG: ATTACH	COPIES OF	MAPS, INCLU	DING THE I	ENTIRE WATE	RSHED AREA.	CLEAR	LY MARK	THE SITE I	
USGS Quadrangle	Name: Marti	insville			NRCS Soil	Map Page:	42	NRCS So	il Map Str	eam Order:
County: Morgan				Townshi	p / City: Wa	shington				
MISCE	LLANEOUS	6								
Base flow condition	ıs? (Y/N)	No I	Date of last pr	ecipitation	10/27/2015			Quantity	0.93	
Photograph informa	ation:									
Elevated Turbidity?	(Y/N) N	0	Canopy (% o	pen):	5					
Were samples colle	ected for wate	er chemistr	y? (Y/N)	No (No	te lab sample	e no. or id. and	d attach	results) La	ab numbe	r: N/A
Field Measures:	Temp (C)		Dissolved oxy	gen (mg/l):		pH:	Con	ductivity (umhos/cm	ı):
s the sampling rea	ch representa	ative of the	stream? (Y/N) Yes	If not, pleas	e explain:				
Additional commen	ts/description	of pollutio	n impacts:							
BIOTIC	EVALUAT	ION								
Performed? (Y/N)	No	(If Yes, ree ID number	cord all observa . Include aprop	tions. Vouc oriate field da	her collections ata sheets from	optional. Note: the Primary He	all vouch adwater	er samples Habitat Ass	s must be la sessment N	beled with the site lanual.)
Fish observed? (Y/I	N)	Voucher?	(Y/N)	Salama	nders observ	ed? (Y/N)		Voucher?	(Y/N)	
	bserved? (Y/	N)	Voucher? (Y	7N)	Aquatic Mad	roinvertebrate	es obser	ved? (Y/N)	Voucher? (Y/N)
Frogs or tadpoles o	· ·	,		,	•					



Stream S6S021c - facing upstream



Stream S6S021c - facing upstream

ChieEPA Primary Headwater Ha	abitat Evaluation Form68IHEI Score (sum of metrics 1, 2, 3)
SITE NAME/LOCATION Sartor Ditch	
SITE NUMBER S6S021d RIVER BASIN	Indian Creek - Sand Cree DRAINAGE AREA (mi) 0.052
LENGTH OF STEAM REACH (ft) LAT 39.431093 LONG.	-86.401328 RIVER CODE N/A RIVER MILE N/A
DATE 10/26/2015 SCORER mr dd COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation	Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL V RECOVE	ERED RECOVERING RECENT OR NO RECOVERY
MODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every type of substrate presen (Max of 32) Add total number of significant substrate types found (Ma	tCheck ONLY two predominant substrate TYPE boxes ax of 8) Final metric score is sum of boxes A and B) HHEI
	Metric
$\square \square BLDR SLABS [16 pts] 0 $	BILT [3 pt] 0 Points
BOULDER (>256 mm) [16 pts] 5 L	EAF PACK/WOODY DEBRIS [3 pts] 5 Substrate
COBBLE (65-256 mm) [9 pts <u>10</u> COBBLE (65-256 mm) [9 pts <u>10</u>	CLAY or HARDPAN [0 pts]
	AUCK [0 pts] 0 23
Total of Percentages of 15.00% (A)	Substrate Percentage 100 % (B) (A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 18	TOTAL NUMBER OF SUBSTRATE TYPES 5
 MAXIMUM POOL DEPTH (Measure the maximum pool depth with evaluation. Avoid plunge pools from road culverts or storm water pi 	hin the 61 meter (200 ft)evaluation reach at the time of Pool Depth pes) Max = 30
>>30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]
 ✓ >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] 	<5 cm [5 pts] No Water or Moist Channel [0 pts] 30
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 25
2 PANK FULL WIDTH (Measured on the overage of 2.4 me	acuramenta) (Check ONLY one box):
S. DANKY OLL WIDTH (Weasured as the average of 5-4 me ↓ > 4.0 meters (>13') [30 pts]	>1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Width
 >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] 	<=1.0m (<=3'3") [5 pts]
COMMENTS:	AVERAGE BANKFULL WIDTH (Meters): 1.2
This information m <u>ust</u> RIPARIAN ZONE AND FLOODPLAIN QUALITY NOT	<u>also be completed</u> E: 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 >10 m Ature Forest, We	etland Conservation Tillage
✓ ✓ Moderate 5-10 m	New Field Open Pasture, Row Crop
□ □ None □ □ Fenced Pasture	Mining or Construction
Comments: yard left, road right	
FLOW REGIME (At time of evaluation) (Check ONLY one	box):
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 □ 0.5 □ 1.5	∠.0 3.0 ∠.5 ✓ >3.0
STREAM GRADIENT ESTIMATE	
☐ Flat (0.5 ft/100 ft)	00 ft) Doderate to Severe Severe (10 ft /100 ft)

QHEI PERFORMED	Yes 🖌 No	QHEI Score:	(If yes, attach co	ompleted QHEI form)	
DOWNSTREAM DE	SIGNATED USE(S)				
WWH Name: Sartor D	itch		Dista	ance from Evaluated Stream	
_ CWH Name:			Dista	ance from Evaluated Stream	
EWH Name:			Dista	ance from Evaluated Stream	
MAPPING: ATTAC	H COPIES OF MAPS, IN	CLUDING THE ENTIRE WA	TERSHED AREA. CLE	ARLY MARK THE SITE LOCATION	
JSGS Quadrangle Name: Ma	rtinsville	NRCS So	oil Map Page: 42	NRCS Soil Map Stream Order:	2
County: Morgan		Township / City:	Vashington		
	10				
	JS Non Data after	-t		Quantity 0.00	
	Yes Date of las	st precipitation: 10/24/20	115		
Photograph information:					
Elevated Turbidity? (Y/N)	No Canopy (% open): 25			
Vere samples collected for wa	ater chemistry? (Y/N)	No (Note lab sam	nle no or id and atta	ch results) Lab number: N	/ A
	• • • •	(A
Field Measures: Temp (C)) Dissolved	oxygen (mg/l):	pH:C	Conductivity (umhos/cm):	A
Field Measures: Temp (C) Temp (C)) Dissolved ntative of the stream? (_ pH: C	Conductivity (umhos/cm):	
Field Measures: Temp (C) s the sampling reach represer Additional comments/description) Dissolved ntative of the stream? ((rice as each oxygen (mg/l): (Y/N) <u>Yes</u> If not, plo	_ pH: C	Conductivity (umhos/cm):	
Field Measures: Temp (C) Is the sampling reach represer Additional comments/description) Dissolved ntative of the stream? (on of pollution impacts	(rice as ear oxygen (mg/l): (Y/N) Yes If not, plo	_ pH: C	Conductivity (umhos/cm):	<u> </u>
Field Measures: Temp (C) s the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA	Dissolved ntative of the stream? (on of pollution impacts	(rice as eac oxygen (mg/l): (Y/N) <u>Yes</u> If not, plo	_ pH: C	Conductivity (umhos/cm):	
Field Measures: Temp (C) s the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) No) Dissolved htative of the stream? (on of pollution impacts TION (If Yes, record all obs ID number. Include a	oxygen (mg/l): (Y/N) Yes If not, ple :: servations. Voucher collection apropriate field data sheets fiel	pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa	conductivity (umhos/cm):	e site
Field Measures: Temp (C) s the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N)	Dissolved Dissolved ntative of the stream? (on of pollution impacts NTION (If Yes, record all obs ID number. Include a Voucher? (Y/N)	oxygen (mg/l): (Y/N) <u>Yes</u> If not, pla (Y/N) <u>Yes</u> If not, pla :: servations. Voucher collection apropriate field data sheets find data sheets	pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa erved? (Y/N)	ucher samples must be labeled with the ter Habitat Assessment Manual.)	e site
Field Measures: Temp (C) is the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? () Dissolved ntative of the stream? (on of pollution impacts NTION (If Yes, record all obs ID number. Include a Voucher? (Y/N) Y/N) Voucher		pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa erved? (Y/N) facroinvertebrates ob:	ucher samples must be labeled with the ter Habitat Assessment Manual.) Voucher? (Y/N) served? (Y/N) Voucher? (Y	e site
Field Measures: Temp (C) s the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology)) Dissolved htative of the stream? (on of pollution impacts TION (If Yes, record all obs ID number. Include a Voucher? (Y/N) Y/N) Voucher	oxygen (mg/l): (Y/N) Yes If not, pla (Y/N) Yes If not, pla s: Servations. Voucher collection apropriate field data sheets find Salamanders observations. ? (Y/N) Aquatic N	pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa erved? (Y/N) facroinvertebrates ob:	ucher samples must be labeled with the ter Habitat Assessment Manual.) Voucher? (Y/N) served? (Y/N) Voucher? (Y	site
Field Measures: Temp (C) as the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology:) Dissolved htative of the stream? (on of pollution impacts NTION (If Yes, record all obs ID number. Include a Voucher? (Y/N) Y/N) Voucher		pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa erved? (Y/N) facroinvertebrates ob:	ucher samples must be labeled with the ter Habitat Assessment Manual.) Voucher? (Y/N) served? (Y/N) Voucher? (Y	> site
Field Measures: Temp (C) is the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) Fish observed? (Y/N) Frogs or tadpoles observed? (Comments Regarding Biology:) Dissolved ntative of the stream? (on of pollution impacts NTION (If Yes, record all obs ID number. Include a Voucher? (Y/N) Y/N) Voucher		pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa erved? (Y/N) facroinvertebrates ob	ucher samples must be labeled with the ter Habitat Assessment Manual.) Voucher? (Y/N) served? (Y/N) Voucher? (Y	≥ site
Field Measures: Temp (C) is the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) No Fish observed? (Y/N) No Frogs or tadpoles observed? (Comments Regarding Biology:) Dissolved ntative of the stream? (on of pollution impacts NTION (If Yes, record all obs ID number. Include a Voucher? (Y/N) Y/N) Voucher	oxygen (mg/l): (Y/N) Yes If not, pla servations. voucher collection apropriate field data sheets f Salamanders observations? ? (Y/N) Aquatic N	pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa erved? (Y/N) facroinvertebrates ob	ucher samples must be labeled with the ter Habitat Assessment Manual.) Voucher? (Y/N) served? (Y/N) Voucher? (Y	≥ site
Field Measures: Temp (C) s the sampling reach represer Additional comments/description Adjacent to road BIOTIC EVALUA Performed? (Y/N) Fish observed? (Y/N) Frogs or tadpoles observed? (' Comments Regarding Biology:) Dissolved Intative of the stream? (on of pollution impacts ID number. Include a Voucher? (Y/N) Y/N) Voucher : ID NARRATIVE DESC	oxygen (mg/l): (Y/N) Yes If not, pland (Y/N) Yes If not, pland servations. Voucher collection apropriate field data sheets f Salamanders observations. ? (Y/N) Aquatic N CRIPTION OF STREAM	pH: C ease explain: ons optional. Note: all vo rom the Primary Headwa erved? (Y/N) facroinvertebrates ob:	ucher samples must be labeled with the ter Habitat Assessment Manual.) Voucher? (Y/N) served? (Y/N) Voucher? (Y	≥ site ″/N)





Stream S6S021d - facing upstream



Stream S6S021d - facing upstream

Stream S6S027



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name: UNT 1	West Fork Clear Creek	Quadrangle:	Martinsville
Basin: Clear C	Creek - East/West/Grassy Fork	County:	Morgan
14-digit HUC: 051202	201140140	Township:	T12N
Drainage area: 0.005 s	sq. mi.	Range:	R1E
Legal Drain: No		Section:	35
IDEM 303(d) Listed: No		Quarter:	SW
USACE Jurisdiction Yes		Latitude:	39.434943
IDEM Jurisdiction: Yes		Longitude:	-86.390544

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S027a	Ephemeral	Dump Rock Gutter	2.00	0.10	HHEI = 12	87	<0.01	0.17
S6S027b	Ephemeral	Concrete Gutter	5.53	0.93	HHEI = 27	132	0.02	0.31
S6S027x	Ephemeral	Natural	4.60	0.50	HHEI = 38	56	0.01	0.00
S6S027y	Ephemeral	Culvert	2.00	0.10	N/A	535	0.02	0.00
Total						810	0.05	0.48

* Includes both permanent and temporary impacts

Approximately 728 feet (0.033 acre) of the UNT 1 to West Fork Clear Creek will be relocated. The OWHM of the UNT 1 to West Fork Clear Creek ranges from 2.0 to 5.5 feet wide by 0.1 to 0.9 feet deep. Impacts to the UNT 1 to West Fork Clear Creek include replacing the existing 535 feet long by 36-inch diameter steel pipe structure carrying SR 37 over the UNT 1 to West Fork of Clear Creek with a 411 feet long 36-inch diameter pipe (Structure P160a). The new relocated UNT 1 to West Fork Clear Creek channel will include encapsulation of 411 feet (0.019 acre) of stream and relocation and revetment riprap armament of 380 feet (0.017 acre) of stream with 82 feet (0.004 acre) of natural channel to remain. The relocation results in the gain of 63 linear feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and stabilized with riprap prior to release of into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be stabilized with riprap due to the steepness of the roadway sideslopes.

No mitigation is being offered for the 535 feet of impacts to the existing encapsulation portion of this stream. A total of 527 feet of mitigation is being offered for the remainder of impacts.

ChicEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 12	
SITE NAME/LOCATION UNT 1 West Fork Clear Creek	-
SITE NUMBER S6S027a RIVER BASIN Clear Creek - East/West/ DRAINAGE AREA (mi) 0.005	5
LENGTH OF STEAM REACH (ft) LAT LAT LONG86.390544 RIVER CODE N/A RIVER MILE N/A	_
DATE 1/14/2016 SCORER ry kl COMMENT	_
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 presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.)	EI
TYPE PERCENT TYPE PERCENT Dein	ric
BLDR SLABS [16 pts] 0 SILT [3 pt] 0	ns
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 Substr BEDROCK [16 pts] 0 FINE DETRITUS [3 pts] 0 Max =	rate : 40
COBBLE (65-256 mm) [9 pts 0 CLAY or HARDPAN [0 pts] 0	
$\square \square SAND (<2 mm) [6 pts] \qquad \square $	
Total of Percentages of 0.00% (A) Substrate Percentage 100 % (B) (A+E	B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 6 TOTAL NUMBER OF SUBSTRATE TYPES 1	
2. MAXIMUM POOL DEPTH (Measure the maximum pool depth within the 61 meter (200 ft)evaluation reach at the time of Pool D)epth
evaluation. Avoid plunge pools from road culverts of storm water pipes) Max = $25 \text{ cm} \cdot 10 \text{ cm} [15 \text{ nts}]$	= 30
 >22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts] ✓ No Water or Moist Channel [0 pts] 	
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bank > 4.0 meters (>13') [30 pts] >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Wid > 3.0 m - 4.0m (>9'7" - 13') [25 pts] ✓ >1.0 m (<=3'3") [5 pts]	cfull Ith = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 0.6 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 >10 m Mature Forest, Wetland Conservation Tillage ✓ Moderate 5-10 m Immature Forest, Shrub or Old Field Vrban or Industrial Narrow <5 m	
FLOW REGIME (At time of evaluation) (Cneck ONLY one box): Steam flowing Moist channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (interstitial) ✓ Comments: 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 >3.0	
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)	

QHEI PERFC	ORMED	Yes	✓ No	QHEI S	core:	(If yes	, attach co	ompleted QHE	l form)	
DOWNSTRE	AM DESK	SNATED	USE(S)							
🖌 WWH Name: 🛛 🛛	est Fork C	Clear Cree	ək				Dista	nce from Eval	uated Stream	n
CWH Name:							Dista	nce from Eval	uated Strean	n
EWH Name:							Dista	nce from Eval	uated Strean	n
MAPPING:	АТТАСН С	OPIES OF	MAPS, INC	LUDING TH		VATERSHED A	REA. CLE	ARLY MARK TH	IE SITE LOCA	TION
JSGS Quadrangle Nan	ne: Martir	isville			NRCS	Soil Map Page	: 42	NRCS Soil	Map Stream	Order:
County: Morgan				Towns	ship / City:	Washington				
MISCELLA	ANEOUS									
Base flow conditions? (Y/N) N	lo [Date of last	t precipitati	on: 1/14/2	016		Quantity	0.1	
Photograph information	1:									-
Elevated Turbidity? (Y/I	N) No	,	Canopy (%	6 open):	70					
Vere samples collected	d for water	chemistry	/? (Y/N)	No (Note lab sa	ample no. or id	. and atta	ch results) Lab	number:	N/A
Field Measures: Te	emp (C)	Γ	Dissolved c	oxygen (mg	ı/l):	pH:	С	onductivity (ur	nhos/cm):	
s the sampling reach re	epresentat	ive of the	stream? (Υ/N) Υ ε	s If not,	please explain	:		·	
				·						
Additional comments/de	escription /	of pollutio	n impacts:							
	·	·	•							
	/ΔΙ ΠΔΤΙ	ON								
Performed? (Y/N)	No	(If Yes, red	ord all obse	ervations. Vo	oucher colled	tions optional.	Note: all vo	ucher samples n	nust be labeled	d with the sit
		ÌD number	. Include ap	propriate field	d data sheet	s from the Prima	ry Headwa	ter Habitat Asse	ssment Manua	al.)
	\	√oucher?	(Y/N)	Salar	manders ol	oserved? (Y/N))	Voucher? (`	Y/N)	
Fish observed? (Y/N)			Vouchor?	(Y/N)	Aquatio	Macroinverte	brates obs	served? (Y/N)	Vou	cher? (Y/N
Fish observed? (Y/N) Frogs or tadpoles obse	rved? (Y/N	1)	voucher?	(1/14)	/ iqualic	macronition		()		`





Stream S6S027a - facing upstream



Stream S6S027a - facing downstream

ChicEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	7
SITE NAME/LOCATION UNIT 1 West Fork Clear Creek	
SITE NAME/EOCATION ON TWEST OR Clear Clear Clear Creek - East/West/ DRAINAGE AREA (mi)	0.005
LENGTH OF STEAM REACH (ff) LAT 39 434803 LONG -86 390865 RIVER CODE N/A RIVER MILE N/	 /A
DATE 1/14/2016 SCORER rv kl COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
	VERY
MODIFICATIONS:	
 SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.) 	HHEI
	Metric
$\square \square BLDR SLABS [16 pts] 0 \square SILT [3 pt] 0$	Points
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0	Substrate
O O	Wax - 40
□ GRAVEL (2-64 mm) [9 pts] 0 □ MUCK [0 pts] 0 □ SAND (<2 mm) [6 pts]	7
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 6 TOTAL NUMBER OF SUBSTRATE TYPES 1	
 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) 	Pool Deptl Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
>22.5 - 30 cm [30 pts] ✓ <5 cm [5 pts]	5
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
	Width Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.6	15
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 >10 m	
□ □ Initiatule Polest, Shub of Old Field □ Obar of Industrial □ □ Narrow <5 m	
None Fenced Pasture Mining or Construction	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
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)	
\checkmark None 1.0 2.0 3.0 0.5 1.5 2.5 >3.0	
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)	ft)

QHEI PERFORMED	🗌 Yes 🖌 No	QHEI Score: 0 (If yes, atta	ach completed QHEI form)	
DOWNSTREAM DES	IGNATED 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, INCL	UDING THE ENTIRE WATERSHED AREA.	CLEARLY MARK THE SITE LOCATION	
USGS Quadrangle Name: Marti	insville	NRCS Soil Map Page:	NRCS Soil Map Stream Orde	r:
County: Morgan		Township / City: Washington		
MISCELLANEOUS	3			
Base flow conditions? (Y/N)	Date of last	precipitation: 1/14/2016	Quantity 0.1	
Photograph information:				
Elevated Turbidity? (Y/N)	Canopy (%	open): 30		
Were samples collected for wate	r chemistry? (Y/N)	No (Note lab sample no. or id. and	d attach results) Lab number:	N/A
Field Measures: Temp (C)	Dissolved ox	kygen (mg/l): pH:	Conductivity (umhos/cm):	
ls the sampling reach representa	ative of the stream? (Y/	(N) Yes If not, please explain:		
Additional comments/description	of pollution impacts:			
,,,,,,,,				
BIOTIC EVALUAT	ION			
BIOTIC EVALUAT Performed? (Y/N) <u>No</u>	ION (If Yes, record all observ ID number. Include apr	vations. Voucher collections optional. Note: opriate field data sheets from the Primary He	all voucher samples must be labeled with adwater Habitat Assessment Manual.)	the sit
BIOTIC EVALUAT Performed? (Y/N) No Fish observed? (Y/N)	ION (If Yes, record all obser ID number. Include apr Voucher? (Y/N)	vations. Voucher collections optional. Note: opriate field data sheets from the Primary He Salamanders observed? (Y/N)	all voucher samples must be labeled with eadwater Habitat Assessment Manual.) Voucher? (Y/N)	the sit
BIOTIC EVALUAT Performed? (Y/N) <u>No</u> Fish observed? (Y/N) Frogs or tadpoles observed? (Y/	ION (If Yes, record all obser ID number. Include apr Voucher? (Y/N) N) Voucher? (vations. Voucher collections optional. Note: opriate field data sheets from the Primary He Salamanders observed? (Y/N) (Y/N)Aquatic Macroinvertebrate	all voucher samples must be labeled with adwater Habitat Assessment Manual.) Voucher? (Y/N) so bserved? (Y/N) Voucher?	the site (Y/N)

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L	u une	S	54	/



Stream S6S027b - facing upstream



Stream S6S027b - facing downstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) 38]
SITE NAME/LOCATION UNT 1 West Fork Clear Creek SITE NUMBER S6S027x RIVER BASIN Clear Creek - East/West/ DRAINAGE AREA (mi) 0.0	005
LENGTH OF STEAM REACH (ft) LAT 39.435184 LONG86.388458 RIVER CODE N/A RIVER MILE N/A	
DATE 12/6/2017 SCORER RKY COMMENT	
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 RECOVER MODIFICATIONS :	ΥY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) HI TYPE PERCENT TYPE PERCENT PERCENT PERCENT	HEI etric pints
BLDR SLABS [16 pts] 0 SILT [3 pt] 0 BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0 BEDROCK [16 pts] 0 CLAY or HARDPAN [0 pts] 0 Max GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0 0 ARTIFICIAL [3 pts] 0 Max 0 0 0	strate c = 40 8
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B) (B)	ι+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 6 TOTAL NUMBER OF SUBSTRATE TYPES 2	
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) Ma	l Depth x = 30
>>30 centimeters [20 pts] ✓ >5 cm - 10 cm [15 pts] >22.5 - 30 cm [30 pts] <5 cm [5 pts]	15
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 5	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bank > 4.0 meters (>13') [30 pts] ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] W > 3.0 m - 4.0m (>9'7" - 13') [25 pts] <=1.0m (<=3'3") [5 pts]	nkfull Vidth 1x = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.4	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 >10 m ✓ Mature Forest, Wetland □ Conservation Tillage Moderate 5-10 m Immature Forest, Shrub or Old Field Urban or Industrial Open Pasture, Row Crop Narrow <5 m	
FLOW REGIME (At time of evaluation) (Check ONLY one box): Steam flowing Image: Comments: Image: 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 >3.0	
STREAM GRADIENT ESTIMATE Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe V Severe (10 ft /100 ft)	

QHEI PERFORMED	🗌 Yes 🖌 No	QHEI Score:	0 (If yes, at	tach completed QHEI for	m)
DOWNSTREAM DES	IGNATED USE(S)				
WWH Name:	Distance from Evaluate	d Stream			
CWH Name:				Distance from Evaluate	d Stream
EWH Name:				Distance from Evaluate	d Stream
MAPPING: ATTACH	COPIES OF MAPS, INC	LUDING THE ENTI	RE WATERSHED ARE	A. CLEARLY MARK THE SI	TE LOCATION
JSGS Quadrangle Name: Marti	nsville	NR	CS Soil Map Page:	NRCS Soil Map	Stream Order:
County: Morgan		Township / C	City: Washington		
MISCELLANEOUS	5	_			
Base flow conditions? (Y/N)	No Date of last	t precipitation: 12	2/5/2017	Quantity 0	.54
Photograph information:					
Elevated Turbidity? (Y/N)	o Canopy (%	% open): 20)		
Vere samples collected for wate	er chemistry? (Y/N)	No (Note la	ab sample no. or id. a	nd attach results) Lab nur	nber: N/A
Field Measures: Temp (C)	Dissolved of	oxygen (mg/l):	pH:	Conductivity (umhos	s/cm):
s the sampling reach representa	ative of the stream? (N	r/N) Yes If	not, please explain:		
Additional comments/description	of pollution impacts:				
BIOTIC EVALUAT	ION				
Performed? (Y/N) No	(If Yes, record all obse ID number. Include ap	rvations. Voucher o propriate field data s	collections optional. Not heets from the Primary I	e: all voucher samples must l leadwater Habitat Assessme	be labeled with the sit nt Manual.)
Fish observed? (Y/N)	Voucher? (Y/N)	Salamande	rs observed? (Y/N)	Voucher? (Y/N)	
Frogs or tadpoles observed? (Y/	N) Voucher?	' (Y/N) Aq	uatic Macroinvertebra	tes observed? (Y/N)	Voucher? (Y/N)
		_			

Matue IN Forest 47 23 Riprag Mature.



Stream S6S027x - facing downstream

Stream S6S028



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 2 West Fork Clear Creek	Quadrangle:	Martinsville
Basin:	Clear Creek - East/West/Grassy Fork	County:	Morgan
14-digit HUC:	05120201140140	Township:	T12N
Drainage area:	0.071 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	35
IDEM 303(d) Listed:	No	Quarter:	NE
USACE Jurisdiction	Yes	Latitude:	39.435182
IDEM Jurisdiction:	Yes	Longitude:	-86.388329

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S028a	Intermittent	Natural	9.25	0.65	HHEI = 40	325	0.07	1.44
S6S028b	Intermittent	Culvert	9.25	0.65	N/A	318	0.07	0.00
S6S028c	Intermittent	Natural	3.95	0.20	HHEI = 26	120	0.01	0.62
Total						763	0.15	2.06

* Includes both permanent and temporary impacts

Approximately 763 feet (0.163acre) of the UNT 2 to West Fork Clear Creek is located within the existing right-of-way of mainline of I-69 and the new Twin Branch Road. The OHWM of the UNT 2 to West Fork Clear Creek ranges from 4.0 to 9.3 feet wide by 0.2 to 0.7 feet deep. Impacts to the UNT 2 to West Fork Clear Creek include replacing the existing 318 feet long by 36-inch diameter steel pipe structure carrying SR 37 over the UNT 2 to West Fork Clear Creek with a 528 feet long 36-inch diameter pipe (77 cubic yards) (Structure P160b). The new relocated UNT 2 to West Fork Clear Creek channel will include 528 feet (0.11 acre) of encapsulation and relocation, 94 feet (0.02 acre) of revetment riprap for scour protection, and 79 feet (0.02 acre) of natural channel to remain. The relocation results in the loss of 63 linear feet of stream.

The construction staging of this contract will be sequenced such that the channel relocation is constructed and stabilized with riprap prior to release of into the channel. Therefore, no temporary sediment and erosion control measures would be required. If water is released into the channel prior to completion of the new channel, a temporary pump around following the typical diagram in Attachment #16 will be required. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact.

The old channel will be filled. Streambanks will be stabilized with riprap due to the steepness of the roadway sideslopes.

No mitigation is being offered for the 318 feet of impacts to the existing encapsulation portion of this stream. A total of 79 feet of stream is being considered restored on-site and atotal of 288 feet of mitigation is being offered for the remainder of impacts.

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	40
SITE NAME/LOCATION UNT 2 West Fork Clear Creek	
SITE NUMBER S6S028a RIVER BASIN Clear Creek - East/West/ DRAINAGE AREA (mi)	0.071
LENGTH OF STEAM REACH (ft) LAT 39.435182 LONG86.388329 RIVER CODE N/A RIVER MILE	N/A
DATE 10/19/2015 SCORER rh COMMENT	
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 RE MODIFICATIONS:	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) TYPE PERCENT TYPE BLDR SLABS [16 pts] 0 SILT [3 pt] BOULDER (>256 mm) [16 pts] 0 0	HHEI Metric Points Substrate
BEDROCK [16 pts] 0 FINE DETRITUS [3 pts] 0 ✓ COBBLE (65-256 mm) [9 pts] 25 ✓ CLAY or HARDPAN [0 pts] 0 GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0 0 ✓ SAND (<2 mm) [6 pts]	Max = 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 25.00% (A) Check 100 % (B) SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 18 TOTAL NUMBER OF SUBSTRATE TYPES 2	(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)	Pool Depth Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts] >22.5 - 30 cm [30 pts] <5 cm [5 pts]	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 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 - 1.5m (>3'3" - 4'8") [15 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
COMMENTS:	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 >10 m ✓ Mature Forest, Wetland □ Conservation Tillage □ Moderate 5-10 m □ Immature Forest, Shrub or Old Field □ Urban or Industrial □ Narrow <5 m	
FLOW REGIME (At time of evaluation) (Check ONLY one box): Steam flowing ✓ Moist channel, isolated pools, no flow (Intermitten Dry channel, no water (Ephemeral) Comments:	t)
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 >3.0 STREAM GRADIENT ESTIMATE	

ADDITIONAL STREAM INFORMATION (This information must also be c	omplete
QHEI PERFORMED 🗌 Yes ✔	No QHEI Score: 0 (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 MAR	PS, INCLUDING THE ENTIRE WATERSHE	D AREA. CLEARLY MARK THE SITE LOCATION
GS Quadrangle Name: Martinsville	NRCS Soil Map P	Page: NRCS Soil Map Stream Order:
unty: Morgan	Township / City: Washing	jton
MISCELLANEOUS		
se flow conditions? (Y/N) Yes Date	of last precipitation: 10/3/2015	Quantity 0.1
otograph information:		
vated Turbidity? (Y/N) No Can	opy (% open): 60	
ere samples collected for water chemistry? (Y	//N) No (Note lab sample no. (or id. and attach results) Lab number: N/A
eld Measures: Temp (C) Disso	blved oxygen (mg/l): pH:	Conductivity (umhos/cm):
the sampling reach representative of the street	am? (Y/N) Vec If not please evr	
		лап.
ditional comments/description of pollution im	pacts:	
BIOTIC EVALUATION		
	all cheen/ations . Voucher collections option	al. Note: all valuebor complex must be labeled with the site
ID number. Inc	lude apropriate field data sheets from the P	Primary Headwater Habitat Assessment Manual.)
sh observed? (Y/N) Voucher? (Y/N	I) Salamanders observed? (Y/N) Voucher? (Y/N)
		ertebrates about add (V/N)
bgs of tadpoles observed? (Y/N) vot	Aquatic Macroinve	
mments Regarding Biology:		
DRAWING AMD NARRATIVE	DESCRIPTION OF STREAM REACH	(This <u>must</u> be completed):
Include important landmarks and other fea	atures of interest for site evaluation and a na	arrative description of the stream's location
		59 -94p
		a starter that
72:	"ast a	1 1. 8 28 18
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Per estrent	A. A	This of the second the second



Stream S6S028a - facing downstream



Stream S6S028a - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	26
SITE NAME/LOCATION UNT 2 West Fork Clear Creek	
SITE NUMBER <u>S6S028c</u> RIVER BASIN <u>Clear Creek - East/West/</u> DRAINAGE AREA (mi)	0.051
LENGTH OF STEAM REACH (ft) LAT39.43805 LONG86.389226 RIVER CODE N/A RIVER MIL	E_N/A
DATE 1/14/2016 SCORER ry kl COMMENT	<u> </u>
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instruction	IS
STREAM CHANNEL ✓ NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO I MODIFICATIONS :	RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.)	HHEI
	Metric
IYPE PERCENI IYPE PERCENI BI DR SLABS [16 pts] 0 SII T [3 pt] 0	Points
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0	Substrate
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Max = 40
□ GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] 0 ✓ SAND (<2 mm) [6 pts]	11
Total of Percentages of 0.00% (A) Substrate Percentage 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 9 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 evaluation. Avoid plunge pools from road culverts or storm water pipes) 	of Pool Depth Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
>22.5 - 30 cm [30 pts] <5 cm [5 pts]	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.2	15
This information must also be completed RIPARIAN ZONE AND EL OODPLAIN OLIALITY NOTE: River left (L) and Right (R) as looking downstream	
L R (Per Bank L R (Most Predominant Per Bank) L R	
✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
Moderate 5-10 m Immature Forest, Shrub or Old Field Urban or Industrial Narrow <5 m Residential Park New Field Open Pasture Row Crr	a
None Fenced Pasture Mining or Construction	γ ρ
Comments:	_
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
Steam flowing ✓ Moist channel, isolated pools, no flow (Intermitt Subsurface flow with isolated pools (interstitial) ✓ Dry channel, no water (Ephemeral)	ent)
SINUOSITY (Number of hends per 61 m (200 ft) of channel. Check ONLY one box)	_
None 1.0 ✓ 2.0 3.0	
0.5 1.5 2.5 >3.0	
STREAM GRADIENT ESTIMATE ☐ Flat (0.5 ft/100 ft)	t /100 ft)

QHEI PERF	ORMED	Yes	✓ No	QHEI Sco	vre:	(If yes, at	tach co	mpleted QHEI f	orm)	
DOWNSTR WWH Name: CWH Name: EWH Name:	EAM DES Vest Fork	GNATED Clear Cre	USE(S) ek				_ Distai _ Distai _ Distai	nce from Evalua nce from Evalua nce from Evalua	ated Stream ated Stream ated Stream	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION										
USGS Quadrangle Na	me: Marti	nsville			NRCS Soil	Map Page:	42	NRCS Soil M	ap Stream C	order:
County: Morgan				Townsh	ip / City: Wa	ashington				
MISCELL Base flow conditions? Photograph informatic	ANEOUS (Y/N) n:	No	Date of last p	recipitation	: 1/14/2016			Quantity	0.1	
Elevated Turbidity? (Y	/N) N	D	Canopy (% d	open):	40					
Nere samples collecte	ed for wate	r chemistr	y? (Y/N)	No (No	ote lab samp	le no. or id. a	nd attac	ch results) Lab r	umber:	N/A
Field Measures:	Temp (C)	I	Dissolved ox	/gen (mg/l)	:	pH:	Co	onductivity (umł	nos/cm):	
s the sampling reach	representa	tive of the	stream? (Y/I	N) Yes	_ If not, plea	ise explain:				
Additional comments/	description	of pollutio	n impacts:							
BIOTIC E	VALUAT	ION								
Performed? (Y/N)	No	(If Yes, re ID numbe	cord all observ r. Include apro	ations. Vouc priate field d	her collection: ata sheets fro	s optional. Note m the Primary F	e: all vou leadwat	icher samples mu er Habitat Assess	st be labeled w ment Manual.)	with the site
Fish observed? (Y/N)		Voucher?	(Y/N)	Salama	anders obser	ved? (Y/N)		Voucher? (Y/	N)	
Frogs or tadpoles obs	erved? (Y/	N)	Voucher? (Y/N)	Aquatic Ma	croinvertebra	tes obs	erved? (Y/N)	Vouch	er? (Y/N)
Commente Degerding	Distant									

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{	FRAvine	3/1/1	11
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ξ	C This Right	SA: ////	
hun	~ JALIA BAR	, / / , /	8



Stream S6S028c - facing downstream



Stream S6S028c - facing upstream

Stream S6S030



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 4 West Fork Clear Creek	Quadrangle:	Martinsville
Basin:	Clear Creek - East/West/Grassy Fork	County:	Morgan
14-digit HUC:	05120201140140	Township:	T12N
Drainage area:	0.042 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	26
IDEM 303(d) Listed:	No	Quarter:	SE
USACE Jurisdiction	Yes	Latitude:	39.442734
IDEM Jurisdiction:	Yes	Longitude:	-86.388003

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S030a	Intermittent	Channelized Ditch	1.90	0.40	HHEI = 11	79	<0.01	0.00
S6S030x	Intermittent	Culvert	2.60	0.50	N/A	120	0.01	0.00
S6S030y	Intermittent	Channelized Ditch	2.60	0.50	HHEI = 18	26	<0.01	0.00
S6S030z	Intermittent	Culvert	1.90	0.40	N/A	247	0.01	0.00
Total						472	0.02	0.00

* Includes both permanent and temporary impacts

The OHWM of the UNT 4 to West Fork Clear Creek ranges from 1.9 to 2.6 feet wide by 0.4 to 0.5 feet deep. The impacts to the UNT 4 to West Fork Clear Creek include replacing the existing structure carrying SR 37 over the UNT 4 to West Fork Clear Creek and the structure that carries Twin Branch Road over the UNT 4 to West Fork Clear Creek. The existing structure on SR 37 is a 248 feet long 30-inch CMP and the structure on Twin Branch Road is a 125 feet long 24 inch CMP. Both existing structures will be replaced with a single new structure (P512) that will be a 330 feet long 36 inch RCP. Impacts to the UNT 4 to West Fork Clear Creek include 330 feet (0.014 acre) of encapsulation (9 cubic yards), 30 feet (0.001 acre) of revetment riprap placed in the channel for scour protection, 112 feet (0.005 acre) of natural channel will remain following the installation of the new structure.

Approximately 472 feet (0.02) of the UNT 4 to West Fork Clear Creek is located within the right-of-way for the mainline of I-69 and the Twin Branch Road and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

No mitigation is being offered for this stream impact since the proposed new structure and riprap length (360 feet) of new encapsulation and riprap being proposed is less than the length of the existing encapsulation at 373 feet.

SITE NUMBER S6S030a RIVER BASIN Clear Creek - East/West/ DRAINAGE IGTH OF STEAM REACH (ft) LAT 39.442896 LONG. -86.387487 RIVER CODE N/A IE 1/14/2016 SCORER ry kl COMMENT	E AREA (mi) RIVER MILEN/ or Instructions ENT OR NO RECO ENT OR NO RECO S TYPE boxes (es A and B.) PERCENT
IGTH OF STEAM REACH (ft) LAT 39.442896 LONG. -86.387487 RIVER CODE N/A TE 1/14/2016 SCORER ry kl COMMENT OTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for REAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING ✓ RECOVERING SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of box PE PERCENT TYPE Image: SILT [3 pt] BUDR SLABS [16 pts] 0 Image: SILT [3 pt] Image: SILT [3 pt] BUDR SLABS [16 pts] 0 Image: SILT [3 pt] Image: SILT [3 pt] BUDR SLABS [16 pts] 0 Image: SILT [3 pt] Image: SILT [3 pt] BUDR SLABS [16 pts] 0 Image: SILT [3 pt] Image: SILT [3 pt] BUDR SLABS [16 pts] 0 Image: SILT [3 pt] Image: SILT [3 pt] BUDR SLABS [16 pts] 0 Image: SILT [3 pt] Image: SILT [3 pt] BUDR SLABS [16 pts] 0 Image: SILT [3 pt] Image: SILT [3 pt] BUDR (2-65-256 mm) [9 pts] 0 </td <td>RIVER MILE N/</td>	RIVER MILE N/
E 1/14/2016 SCORER ry kl COMMENT DTE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Obio's PH	Pr Instructions ENT OR NO RECO TYPE boxes (es A and B.) PERCENT
TE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for EAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING ✓ REC CODIFICATIONS: SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of box PE PERCENT TYPE Final metric score is sum of box BLDR SLABS [16 pts] 0 0 SILT [3 pt] LEAF PACK/WOODY DEBRIS [3 pts] FINE DETRITUS [3 pts] BEDROCK [16 pts] 0 V V V MUCK [0 pts] HUCK [0 pts]	er Instructions ENT OR NO RECO TYPE boxes (es A and B.) PERCENT
EAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING ✓ RECOVERING DDIFICATIONS: SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of box PE PERCENT TYPE BLDR SLABS [16 pts] 0 SILT [3 pt] BOULDER (>256 mm) [16 pts] 0 SILT [3 pt] BEDROCK [16 pts] 0 Image: Since the two predominants substrate substrate types found (Max of 8). Final metric score is sum of box BCROER (>256 mm) [16 pts] 0 Image: Since the two predominants substrate substrate types found (Max of 8). Final metric score is sum of box BCROER (>256 mm) [16 pts] 0 Image: Since the two predominants substrate substrate types found (Max of 8). Final metric score is sum of box GRAVEL (2-64 mm) [9 pts] 0 Image: Since the two predominants substrate subs	ENT OR NO RECO TYPE boxes (es A and B.) PERCENT
SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of box PE PERCENT TYPE BLDR SLABS [16 pts] 0 Image: SILT [3 pt] BOULDER (>256 mm) [16 pts] 0 Image: SILT [3 pt] BEDROCK [16 pts] 0 Image: SILT [3 pt] COBBLE (65-256 mm) [9 pts] 0 Image: SILT [3 pt] GRAVEL (2-64 mm) [9 pts] 0 Image: SILT [0 pts] O Image: SILT [0 pts] 0 Image: SILT [2 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SILT [3 pt] 0 Image: SILT [3 pt] Image: SI	e TYPE boxes (es A and B.) PERCENT
PE PERCENT TYPE I BLDR SLABS [16 pts] 0 □ SILT [3 pt] □ BOULDER (>256 mm) [16 pts] 0 □ LEAF PACK/WOODY DEBRIS [3 pts] □ BEDROCK [16 pts] 0 □ FINE DETRITUS [3 pts] □ COBBLE (65-256 mm) [9 pts] 0 ✓ ✓ CLAY or HARDPAN [0 pts] GRAVEL (2-64 mm) [9 pts] 0 □ MUCK [0 pts] ■	PERCENT
BLDR SLABS [16 pts] 0 SILT [3 pt] BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] BEDROCK [16 pts] 0 FINE DETRITUS [3 pts] COBBLE (65-256 mm) [9 pts] 0 ✓ GRAVEL (2-64 mm) [9 pts] 0 MUCK [0 pts] O 0 MUCK [0 pts]	
□ BOOLDER (>236 mm) [16 pts] □ <td□< td=""><td>0</td></td□<>	0
□ COBBLE (65-256 mm) [9 pts] 0 ✓ ✓ CLAY or HARDPAN [0 pts] □ GRAVEL (2-64 mm) [9 pts] 0 □ MUCK [0 pts] □	0
	100
□ SAND (<2 mm) [6 pts] 0 □ ARTIFICIAL [3 pts]	0
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock 0.00% (A) Substrate Percentage 100 %	(B)
DRE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 0 TOTAL NUMBER OF SUBSTRATE TYPES	rpes 1
MAXIMUM POOL DEPTH (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reac evaluation. Avoid plunge pools from road culverts or storm water pipes)	h at the time of
> >30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
>22.5 - 30 cm [30 pts] <5 cm [5 pts]	
COMMENTS: MAXIMUM POOL DEPTH (centime	ters): 0
BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):
> 4.0 meters (>13') [30 pts] > 2.0 m - 4.0 m (>3'3" - 4'8") [15 pts]	
>3.0 m - 4.0m (>97 - 13) [25 pts] >1.5 m - 3.0 m(>97" - 4'8") [20 pts]	
COMMENTS: AVERAGE BANKFULL WIDTH (Me	ters): 0.0
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 >10 m Conservation Mature Forest, Wetland Conservation	tion Tillage
Narrow <5 m	ndustrial sture. Row Crop
✓ ✓ None □ □ Fenced Pasture □ Mining or	Construction
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
Steam flowing Moist channel, isolated pools, no	flow (Intermittent)
Subsurface flow with isolated pools (interstitial)	1)
SINUUSITY (Number of bends per 61 m (200 ft) of channel. Check ONLY one box)	0
0.5 1.5 2.0 3.1	3.0

QHEI PERFORMED Yes V No QHEI Score: (If yes	es, 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 BWH Name: Distance from Evaluated Stream										
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION										
USGS Quadrangle Name: Martinsville NRCS Soil Map Pa	ige: NRCS Soil Map Stream Order:2									
County: Morgan Township / City: Washington	on									
MISCELLANEOUS Base flow conditions? (Y/N) Yes Date of last precipitation: 1/14/2016 Photograph information:	Quantity 0.1									
Elevated Turbidity? (Y/N) No Canopy (% open): 100										
Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or	rid. and attach results) Lab number: N/A									
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):									
s the sampling reach representative of the stream? (Y/N) Yes If not, please expla	ain:									
Additional comments/description of pollution impacts:										
BIOTIC EVALUATION										
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional ID number. Include apropriate field data sheets from the Prin	I. Note: all voucher samples must be labeled with the site mary 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 Macroinver	rtebrates observed? (Y/N) Voucher? (Y/N)									
Comments Regarding Biology:										

Passure A	7#	2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	1: 15	- :
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	51	3 - 4		- 51
٢	~4	J - Rigreg ?		



Stream S6S030a - facing downstream



Stream S6S030a - facing upstream

ChieEPA Primary Headwater H	Iabitat Evaluation Form 18
	HHEI Score (sum of metrics 1, 2, 3)
SITE NAME/LOCATION UNT 4 West Fork Clear Creek	
SITE NUMBER S6S030y RIVER BASI	N Clear Creek - East/West/ DRAINAGE AREA (mi) 0.042
LENGTH OF STEAM REACH (ft) LAT 39.442997 LONG	G86.387025 RIVER CODE N/A RIVER MILE N/A
DATE 12/6/2017 SCORER RKY COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation	on Manual for Ohio's PHWH Streams" for Instructions
	VERED RECOVERING RECENT OR NO RECOVERY
MODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every type of substrate prese	entCheck ONLY two predominant substrate TYPE boxes
(Max of 32). Add total number of significant subsrate types found (I	Vax of 8). Final metric score is sum of boxes A and B.)
TYPE PERCENT TYPE	PERCENT Points
□ □ BLDR SLABS [16 pts]0	SILT [3 pt] 90 Substrate
	FINE DETRITUS [3 pts] 0 Max = 40
GRAVEL (2-64 mm) [9 pts]	CLAY of HARDPAN [0 pts] 0 MUCK [0 pts] 0
SAND (<2 mm) [6 pts] 0	ARTIFICIAL [3 pts] 10 8
Total of Percentages of (A)	Substrate Percentage Check (B) (A+B)
Bldr Slabs, Boulder, Cobble, Bedrock	
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 6	TOTAL NUMBER OF SUBSTRATE TYPES 2
2. MAXIMUM POOL DEPTH (Measure the maximum pool depth we evaluation. Avoid plunge pools from road culverts or storm water	/ithin the 61 meter (200 ft)evaluation reach at the time of pipes) Pool Depth Max = 30
>>30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]
	<pre><5 cm [5 pts] No Water or Moist Channel [0 pts] 5</pre>
	MAXIMUM POOL DEPTH (centimeters):
3. BANK FULL WIDTH (Measured as the average of 3-4 m	neasurements) (Check ONLY one box): Bankfull
> 4.0 meters (>13') [30 pts]	1 > 1.0 m - 1.5 m (>3'3" - 4'8") [15 pts] Width Max = 30
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
COMMENTS	
This information mus	st also be completed
RIPARIAN ZONE AND FLOODPLAIN QUALITY NO	TE: River left (L) and Right (R) as looking downstream
RIPARIAN WIDTH FLOODPLAIN QUALITY	<u>(</u>
L R (Per Bank L R (Most Predomina	Int Per Bank) L R
Mature Porest, V	t, Shrub or Old Field
Narrow <5 m Residential, Par None None	k, New Field Open Pasture, Row Crop
Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY on	
Steam flowing	Moist channel, isolated pools, no flow (Intermittent)
Subsurface flow with isolated pools (interstitial)	Dry channel, no water (Ephemeral)
None I 0	
☐ Flat (0.5 tt/100 tt) ✓ Flat to Moderate Moderate (2 ft/	100 π) [] Moderate to Severe [] Severe (10 ft /100 ft)

QHEI PERFORMED	🗌 Yes 🗸	No QH	IEI Score:	0	(If yes, at	ach completed	QHEI form)
DOWNSTREAM DESI	GNATED USE	E(S)						
WWH Name:							n Evaluated	Stream
CWH Name:						Distance from	n Evaluated	Stream
EWH Name:						Distance from	n Evaluated	Stream
MAPPING: ATTACH	COPIES OF MA	PS, INCLUDIN	IG THE ENT	IRE WATE	RSHED AREA	. CLEARLY MA	RK THE SIT	E LOCATION
JSGS Quadrangle Name: Marti	nsville		NF	RCS Soil N	ap Page:	NRCS	Soil Map S	Stream Order:
County: Morgan		Т	ownship /	City: Was	hington			
Base flow conditions? (Y/N)	No Date	of last preci	pitation: 1 :	2/5/2017		Quant	tity 0.5	54
Photograph information:								
Elevated Turbidity? (Y/N)	o Car	nopy (% oper	n): 1 0	00				
Vere samples collected for wate	r chemistry? (`	r/N) No	(Note I	ab sample	no. or id. ar	nd attach result	s) Lab num	ber: N/A
ield Measures: Temp (C)	Diss	olved oxyger	n (mg/l):		pH:	Conductiv	ity (umhos/	cm):
s the sampling reach representa	tive of the stre	am? (Y/N)	Yes If	not, pleas	e explain:			
Additional comments/description	of pollution im	pacts:						
BIOTIC EVALUAT	ION							
Performed? (Y/N) No	(If Yes, record ID number. In	all observation	is. Voucher te field data s	collections of sheets from	optional. Note the Primary F	e: all voucher sam leadwater Habita	iples must be t Assessmen	e labeled with the s t Manual.)
Fish observed? (Y/N)	Voucher? (Y/I	۱)	Salamande	ers observe	ed? (Y/N)	Vouch	ner? (Y/N)	
Frogs or tadpoles observed? (Y/	N) Vo	ucher? (Y/N)	Aq	uatic Mac	oinvertebra	es observed? ((Y/N)	Voucher? (Y/





Stream S6S030y - facing upstream



Stream S6S030y - facing downstream

Stream S6S035



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 8 West Fork Clear Creek	Quadrangle:	Martinsville
Basin:	Clear Creek - East/West/Grassy Fork	County:	Morgan
14-digit HUC:	05120201140140	Township:	T12N
Drainage area:	0.005 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	26
IDEM 303(d) Listed:	No	Quarter:	SE
USACE Jurisdiction	Yes	Latitude:	39.444513
IDEM Jurisdiction:	Yes	Longitude:	-86.387838

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S035a	Intermittent	Channelized Ditch	2.00	0.20	HHEI = 11	0	0.00	0.00
S6S035x	Intermittent	Culvert	3.30	0.30	N/A	126	0.01	0.00
S6S035y	Intermittent	Natural	3.30	0.30	HHEI = 37	12	<0.01	0.00
S6S035z	Intermittent	Culvert	2.00	0.20	N/A	0	0.00	0.00
Total				-		138	0.01	0.00

* Includes both permanent and temporary impacts

The OHWM for this location of the UNT 8 to West Fork Clear Creek is 3.3 feet wide by 0.3 feet deep. The existing 56 foot-long by 24-inch diameter RCP carrying Twin Branch Road over UNT 8 to West Fork Clear Creek will be replaced with a 54-foot-long by 36-inch diameter RCP (Structure P511). Impacts associated with the installation of the new structure include 30 feet (0.002 acre) of revetment riprap lined channel, 54 feet (0.004) of encapsulation, 25 feet (0.002 acre) of open natural channel will remain following the installation of the new structure.

Approximately 138 feet (0.008 acre) of the UNT 8 to West Fork Clear Creek is located within the existing right-of-way for Twin Branch and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 28 feet of mitigation is being offered for all impacts not within the existing encapsulation of this stream and no mitigation is being offered for the 54 feet of existing encapsulation.

		EI SCOIE (SUIII OF	inetrics 1, 2, 3)
NAME/LOCATION UNT 8 West For			
	65035a RIVER BASIN C		
		00.307030 RIVER CODE	
TE: Complete All Items On This Forr	- Refer to ""Field Evaluation M	anual for Ohio's PHWH S	Streams" for Instructions
			V RECENT OR NO REC
SUBSTRATE (Estimate percent of e (Max of 32). Add total number of sign	rery type of substrate presentCh ficant subsrate types found (Max of	eck ONLY two predomina of 8). Final metric score is	nt substrate TYPE boxes sum of boxes A and B.)
<u>'PE</u>	PERCENT TYPE		PERCENT
BLDR SLABS [16 pts]		- [3 pt] E PACK/WOODY DEBRIS	0 0
BEDROCK [16 pts]		E DETRITUS [3 pts]	
GRAVEL (2-64 mm) [9 pts]		CK [0 pts]	0
SAND (<2 mm) [6 pts]	<u> 0 </u>	IFICIAL [3 pts]	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	0.00% (A)	ostrate Percentage 100 %	(B)
ORE OF TWO MOST PREDOMINATE S	JBSTRATE TYPES 0 TO	OTAL NUMBER OF SUB	STRATE TYPES 1
MAXIMUM POOL DEPTH (Measure	the maximum pool depth within	the 61 meter (200 ft)eval	uation reach at the time of
evaluation. Avoid plunge pools from	road culverts or storm water pipes	5)	
>22.5 - 30 cm [30 pts]		5 cm [5 pts]	
		- Materian Asiat Chammed	
>10 - 22.5 cm [25 pis]		o Water or Moist Channel	[0 pts]
COMMENTS:	N	o Water or Moist Channel MAXIMUM POOL DEPT	[0 pts] H (centimeters): 0
COMMENTS:BANK FULL WIDTH (Measured	as the average of 3-4 meas	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON	[0 pts] H (centimeters): 0
COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts]	as the average of 3-4 meas	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1 0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts]
Source Source COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	as the average of 3-4 meas	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts]
COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	as the average of 3-4 meas	MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts] AVERAGE BANKFULL	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6
>10 - 22.5 cm [25 pts] COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	as the average of 3-4 meas	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts] AVERAGE BANKFULL V	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6
>10 - 22.5 cm [25 pts] COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS:	as the average of 3-4 measurements of 3-4 meas	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts] AVERAGE BANKFULL N o be completed	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6
>10 - 22.5 cm [25 pts] COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE	as the average of 3-4 measure This information must als PLAIN QUALITY NOTE: F	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts] AVERAGE BANKFULL M o be completed River left (L) and Right (R)	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream
COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOOD <u>RIPARIAN WIDTH</u>	This information must als PLAIN QUALITY NOTE: F FLOODPLAIN QUALITY	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts] AVERAGE BANKFULL N o be completed River left (L) and Right (R)	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream
COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH L R (Per Bank Wide >10 m	This information must als PLAIN QUALITY NOTE: F FLOODPLAIN QUALITY L R (Most Predominant Pe ☐ Mature Forest. Wetla	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ONI 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage
COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Norman of the second secon	This information must als This information must als PLAIN QUALITY L R (Most Predominant Pe Mature Forest, Shr Description Descriptions	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage Urban or Industrial Once Desture Daw Core
COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	as the average of 3-4 measurements of a state average of 3-4 measurements and a state average of 3-4 measurements and a state average of 3-4 measurements average overage ove	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage Urban or Industrial Open Pasture, Row Crop Mining or Construction
COMMENTS: BANK FULL WIDTH (Measured > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	This information must als This information must als PLAIN QUALITY L R (Most Predominant Pe Mature Forest, Wetla Mature Forest, Wetla Mature Forest, Shr Residential, Park, Ne Fenced Pasture	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage Urban or Industrial Open Pasture, Row Crop Mining or Construction
>10 - 22.5 cm [25 pts] COMMENTS: BANK FULL WIDTH (Measuree > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOOE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	as the average of 3-4 measure This information must also PLAIN QUALITY NOTE: F FLOODPLAIN QUALITY L R (Most Predominant Per Mature Forest, Wetla Immature Forest, Wetla Mature Forest, Wetla Residential, Park, Ne Fenced Pasture Valuation) (Check ONLY one box	o Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ONI 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage Urban or Industrial Open Pasture, Row Crop Mining or Construction
COMMENTS: BANK FULL WIDTH (Measures > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	This information must als This information must als PLAIN QUALITY NOTE: F FLOODPLAIN QUALITY L R (Most Predominant Pe Mature Forest, Wetla Immature Forest, Wetla Immature Forest, Shr Residential, Park, Ne Fenced Pasture valuation) (Check ONLY one box bls (interstitial)	MAXIMUM POOL DEPT Urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts] AVERAGE BANKFULL M o be completed River left (L) and Right (R) er Bank) L R nd ub or Old Field w Field	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage Urban or Industrial Open Pasture, Row Crop Mining or Construction H pools, no flow (Intermittent) (Ephemeral)
>10 - 22.5 cm [25 pts] COMMENTS: BANK FULL WIDTH (Measurer > 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOOE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	As the average of 3-4 measure This information must also PLAIN QUALITY NOTE: F FLOODPLAIN QUALITY L R (Most Predominant Per Mature Forest, Wetla Immature Forest, Shr Residential, Park, Ne Fenced Pasture Valuation) (Check ONLY one box bls (interstitial)	MAXIMUM POOL DEPT Urements) (Check ON 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts] AVERAGE BANKFULL M o be completed River left (L) and Right (R) or Bank) L R nd ub or Old Field U w Field U Size Moist channel, isolated Dry channel, no water	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage Urban or Industrial Open Pasture, Row Crop Mining or Construction H pools, no flow (Intermittent) (Ephemeral)
>10 - 22.5 cm [25 pts] COMMENTS: BANK FULL WIDTH (Measures) > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] COMMENTS: RIPARIAN ZONE AND FLOOE RIPARIAN WIDTH L R (Per Bank Wide >10 m Moderate 5-10 m Narrow <5 m	as the average of 3-4 measure Image: style="text-align: center;">Image: style="text-align: center;"/>Image: style="text-align: center;"/>Image: style="text-alig	a Water or Moist Channel MAXIMUM POOL DEPT urements) (Check ONI 1.0 m - 1.5m (>3'3" - 4'8") =1.0m (<=3'3") [5 pts]	[0 pts] H (centimeters): 0 _Y one box): [15 pts] WIDTH (Meters): 0.6 as looking downstream Conservation Tillage Urban or Industrial Open Pasture, Row Crop Mining or Construction I pools, no flow (Intermittent) (Ephemeral)

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QHEI PERFORME) 🗌 Yes 🖌 No	QHEI Score:	(If yes, attac	h completed QHEI forn	n)
DOWNSTREAM DE WWH Name: CWH Name: EWH Name:	ESIGNATED USE(S) rk Clear Creek		D	istance from Evaluated istance from Evaluated istance from Evaluated	d Stream d Stream d Stream
MAPPING: ATTAC	H COPIES OF MAPS,	INCLUDING THE ENTIR	E WATERSHED AREA. (CLEARLY MARK THE SIT	TE LOCATION
USGS Quadrangle Name: Ma	rtinsville	NRC	S Soil Map Page: 4	2 NRCS Soil Map	Stream Order: 0
County: Morgan		Township / Cit	ty: Washington		
MISCELLANEO Base flow conditions? (Y/N) Photograph information:	US Yes Date of	last precipitation: 1/14	4/2016	Quantity0	.1
Elevated Turbidity? (Y/N)	No Canopy	/ (% open): 100			
Were samples collected for wa	ater chemistry? (Y/N	No (Note lab	sample no. or id. and a	attach results) Lab nun	nber: N/A
Field Measures: Temp (C) Dissolve	ed oxygen (mg/l):	pH:	Conductivity (umhos	/cm):
s the sampling reach represe	ntative of the stream	? (Y/N) Yes If no	ot, please explain:		
Additional comments/descripti	on of pollution impac	ts:			
BIOTIC EVALUA	ATION				
Performed? (Y/N) No	(If Yes, record all c ID number. Includ	bservations. Voucher co e apropriate field data she	llections optional. Note: a eets from the Primary Hea	ll voucher samples must b dwater Habitat Assessme	e labeled with the site nt Manual.)
Fish observed? (Y/N)	Voucher? (Y/N)	Salamanders	observed? (Y/N)	Voucher? (Y/N)	
Frogs or tadpoles observed? (Y/N) Vouch	er? (Y/N) Aqua	atic Macroinvertebrates	observed? (Y/N)	Voucher? (Y/N)
Commente Degerding Dielegy		-			





Stream S6S035a - facing upstream



Stream S6S035a - facing downstream

ChieEPA Primary Headwa	ter Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)
SITE NAME/LOCATION UNT 8 West Fork Clear Creek	
SITE NUMBER S6S035y RIV	ER BASIN Clear Creek - East/West/ DRAINAGE AREA (mi 0.03
LENGTH OF STEAM REACH (ft) LAT 39.44485	57 LONG. <u>-86.386955</u> RIVER CODE <u>N/A</u> RIVER MILE <u>N/A</u>
DATE 12/6/2017 SCORER RKY COMME	ENT
NOTE: Complete All Items On This Form - Refer to ""Field	Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATURAL CHANNEL MODIFICATIONS:] RECOVERED
1. SUBSTRATE (Estimate percent of every type of substr (Max of 32). Add total number of significant subsrate type	ate presentCheck ONLY two predominant substrate TYPE boxes s found (Max of 8). Final metric score is sum of boxes A and B.)
TYPE PERCENT	TYPE PERCENT Points
BLDR SLABS [16 pts]	✓ ✓ SILT [3 pt] 100 LEAF PACK/MOODY DEBRIS [3 pts] 0 Substrat
BEDROCK [16 pts]	
GRAVEL (65-256 mm) [9 pts GRAVEL (2-64 mm) [9 pts]	CLAY or HARDPAN [0 pts] O MUCK [0 pts] O
SAND (<2 mm) [6 pts]	ARTIFICIAL [3 pts]
Total of Percentages of 0.00% (A) Bldr Slabs, Boulder, Cobble, Bedrock	Substrate Percentage Check 100 % (B) (A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES	6 TOTAL NUMBER OF SUBSTRATE TYPES 1
2. MAXIMUM POOL DEPTH (Measure the maximum pool evaluation. Avoid plunge pools from road culverts or sto	I depth within the 61 meter (200 ft)evaluation reach at the time of rm water pipes) Pool Dep Max = 3
>>30 centimeters [20 pts]	✓ >5 cm - 10 cm [15 pts]
>22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts]	 S cm [5 pts] No Water or Moist Channel [0 pts] 15
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 8
3. BANK FULL WIDTH (Measured as the average	of 3-4 measurements) (Check ONLY one box): Bankfu
> 4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts]	 ✓ >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3") [5 pts] ✓ Max = 3
>1.5 m - 3.0 m(>9'7" - 4'8") [20 pts]	
	AVERAGE BANKFULL WIDTH (Meters): 1
This informa RIPARIAN ZONE AND FLOODPLAIN QUALITY	t ion m<u>ust a</u>lso be completed NOTE: River left (L) and Right (R) as looking downstream
RIPARIAN WIDTH FLOODPLAIN	QUALITY
L R (Per Bank L R (Most P	redominant Per Bank) <u>L</u> R
✓ ✓ Wide >10 m	Forest, Wetland Conservation Tillage
	ntial, Park, New Field Open Pasture, Row Crop
Comments:	Pasture
FLOW REGIME (At time of evolution) (Check	
Steam flowing	Moist channel, isolated pools, no flow (Intermittent)
Subsurface flow with isolated pools (interstitial)	Dry channel, no water (Ephemeral)
None 10	
	rete (2, #/400, #)

QHEI PERFORMED	Yes 🖌 No 🛛 QHE	I Score: 0	(If yes, attach co	mpleted QHEI for	m)		
DOWNSTREAM DESIGN	ATED USE(S)						
WWH Name: Distance from Evaluated Stre							
CWH Name:			Dista	nce from Evaluate	d Stream		
EWH Name:			Dista	nce from Evaluate	d Stream		
MAPPING: ATTACH COP	PIES OF MAPS, INCLUDING	THE ENTIRE WATER	SHED AREA. CLE	ARLY MARK THE S	TE LOCATION		
JSGS Quadrangle Name: Martins	ville	NRCS Soil M	ap Page:	NRCS Soil Map	Stream Order:		
County: Morgan	Том	wnship / City: Was	hington				
Base flow conditions? (Y/N) No	Date of last precipit	ation: 12/5/2017		Quantity 0	.54		
Photograph information:	_ · ·			·			
Elevated Turbidity? (Y/N) No	Canopy (% open):	80					
Were samples collected for water ch	nemistry? (Y/N) No	(Note lab sample	no. or id. and atta	ch results) Lab nui	mber: N/A		
Field Measures: Temp (C)	Dissolved oxygen (I	mg/l):	pH: C	onductivity (umhos	s/cm):		
s the sampling reach representative	e of the stream? (Y/N)	Yes If not, please	explain:				
Additional comments/description of	pollution impacts:						
BIOTIC EVALUATION	1						
Performed? (Y/N) <u>No</u> (If ID	Yes, record all observations. number. Include apropriate f	Voucher collections of ield data sheets from	ptional. Note: all vo the Primary Headwa	ucher samples must ter Habitat Assessme	be labeled with the site ent Manual.)		
Fish observed? (Y/N) Vo	ucher? (Y/N) Sa	lamanders observe	:d? (Y/N)	Voucher? (Y/N)			
Frogs or tadpoles observed? (Y/N)	Voucher? (Y/N)	Aquatic Macr	oinvertebrates obs	served? (Y/N)	Voucher? (Y/N)		
	• =	-					





Stream S6S035y - facing downstream



Stream S6S035y - facing upstream
Stream S6S114



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Stream Name:	UNT 3 West Fork Clear Creek	Quadrangle:	Martinsville
Basin:	Clear Creek - East/West/Grassy Fork	County:	Morgan
14-digit HUC:	05120201140140	Township:	T12N
Drainage area:	0.03 sq. mi.	Range:	R1E
Legal Drain:	No	Section:	35
IDEM 303(d) Listed:	No	Quarter:	NE
USACE Jurisdiction	Yes	Latitude:	39.441638
IDEM Jurisdiction:	Yes	Longitude:	-86.386755

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S114a	Intermittent	Natural	4.60	0.70	HHEI = 33	176	0.02	0.61
S6S114b	Intermittent	Culvert	4.60	0.50	N/A	74	0.01	0.00
S6S114c	Intermittent	Channelized Ditch	4.60	0.50	HHEI = 29	27	<0.01	0.00
S6S114d	Intermittent	Culvert	4.60	0.50	N/A	354	0.04	0.00
Total						631	0.07	0.61

* Includes both permanent and temporary impacts

The OWHM of the UNT 3 to West Fork Clear Creek averages 4.6 feet wide and ranges from 0.5 to 0.7 feet deep. The impacts to the UNT 3 to West Fork Clear Creek include replacing the existing structure carrying SR 37 over the UNT 3 to West Fork Clear Creek and the existing structure that carries Twin Branch Road over the UNT 3 to West Fork Clear Creek. The existing structure on SR 37 is a 354 foot long 36 inch steel pipe and the existing structure on Twin Branch Road is a 58 feet long 24 inch concrete pipe. Both existing structures will be replaced with a single new structure (P510) that will be a 472 foot long by 36-inch diameter RCP (56 cubic yards). Impacts to the UNT 3 to West Fork Clear Creek include 472 feet (0.050 acre) of encapsulation, 15 feet (0.002 acre) of revetment riprap for scour protection, 152 feet (0.16 acre) of natural channel will remain following the installation of the new structure.

Approximately 631 feet (0.067 acre) of the UNT 3 to West Fork Clear Creek is located within the right of way for mainline of I-69 and the Twin Branch Road and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 75 feet of mitigation is being offered for this stream impact due to the new encapsulation. Mitigation is not being offered for the 354 and 58 feet of existing encapsulation.

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	33
SITE NAME/LOCATION UNT 3 West Fork Clear Creek	
SITE NUMBER S6S114a RIVER BASIN Clear Creek - East/West/ DRAINAGE AREA (mi)	0.03
LENGTH OF STEAM REACH (ft) LAT 39.441638 LONG86.386755 RIVER CODE N/A RIVER MILE	N/A
DATE 12/6/2017 SCORER RKY COMMENT	
NOTE: Complete All Items On This Form - Refer to ""Field Evaluation Manual for Ohio's PHWH Streams" for Instructions	
STREAM CHANNEL	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate presentCheck 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 and B.)	HHEI
	Metric
TYPE PERCENT TYPE PERCENT BLDR SLARS [16 pts] 0 SILT [3 pt] 0	Points
BOULDER (>256 mm) [16 pts] 0 LEAF PACK/WOODY DEBRIS [3 pts] 0	Substrate
$\square \square BEDROCK [16 pts] \qquad 0 \qquad \square \square FINE DETRITOS [3 pts] \qquad 0 \\ \square \square COBBLE (65-256 mm) [9 pts 0 \qquad 0 \qquad \square \square CLAY or HARDPAN [0 pts] \qquad 0$	Max = 40
✓ GRAVEL (2-64 mm) [9 pts] 60 MUCK [0 pts] 0 ✓ SAND (<2 mm) [6 pts]	18
Total of Percentages of 0.00% (A) Check 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 15 TOTAL NUMBER OF SUBSTRATE TYPES 3	
2 MAXIMUM POOL DEPTH (Measure the maximum peel depth within the 61 meter (200 ft) valuation reach at the time of	Bool Donth
evaluation. Avoid plunge pools from road culverts or storm water pipes)	Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts]	
 → 22.5 - 50 cm [50 pts] >10 - 22.5 cm [25 pts] ✓ No Water or Moist Channel [0 pts] 	0
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
>4.0 meters (>13') [30 pts] >3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.0 m - 1.5m (>3'3" - 4'8") [15 pts]	Width Max = 30
>1.5 m - 3.0 m(>9/7" - 4'8") [20 pts]	
COMMENTS:	15
This information m <u>ust a</u> lso 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	
✓ ✓ Moderate 5-10 m ✓ ✓ Mature Forest, Wetland ✓ ⊂ Conservation Fillage	
□ Narrow <5 m ✓ ✓ Residential, Park, New Field □ Open Pasture, Row Crop	
Comments: thinly wooded	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
Steam flowing Moist channel, isolated pools, no flow (Intermittent)	
Subsurface flow with isolated pools (interstitial) ✓ Dry channel, no water (Ephemeral)	
SINITORIAL (Number of bends per 61 m (200 ft) of channel. Check ONILY one box)	
None □ 1.0 □ 2.0 □ 3.0	
✓ 0.5 □ 1.5 □ 2.5 □ >3.0	
STREAM GRADIENT ESTIMATE ☐ Flat (0.5 ft/100 ft)	0 ft)

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 W	ATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Martinsville NRCS S	Soil Map Page: NRCS Soil Map Stream Order:
County: Morgan Township / City:	Washington
Base flow conditions? (Y/N) No Date of last precipitation: 12/5/20	017 Quantity 0.54
Photograph information:	
Elevated Turbidity? (Y/N) No Canopy (% open): 50	
Were samples collected for water chemistry? (Y/N) No (Note lab sa	mple no. or id. and attach results) Lab number: N/A
Field Measures: Temp (C) Dissolved oxygen (mg/l):	pH: Conductivity (umhos/cm):
Is the sampling reach representative of the stream? (Y/N) Yes If not, p	olease explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N) No (If Yes, record all observations. Voucher collect ID number. Include apropriate field data sheets	tions optional. Note: all voucher samples must be labeled with the sit from the Primary Headwater Habitat Assessment Manual.)
Fish observed? (Y/N) Voucher? (Y/N) Salamanders ob	served? (Y/N) Voucher? (Y/N)
Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic	Macroinvertebrates observed? (Y/N) Voucher? (Y/N)

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





Stream S6S114a - facing downstream



Stream S6S114a - facing upstream

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	9
SITE NAME/LOCATION UNT 3 West Fork Clear Creek	
SITE NUMBER S6S114c RIVER BASIN Clear Creek - East/West/ DRAINAGE AREA (mi)	0.03
LENGTH OF STEAM REACH (ft) LAT 39.44132 LONG86.387013 RIVER CODE N/A RIVER MILE N/	/A
DATE 12/6/2017 SCORER RKY COMMENT	
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 RECOVERED MODIFICATIONS:	VERY
SUBSTRATE (Estimate percent of every type of substrate presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) TYPE PERCENT TYPE PERCENT	HHEI Metric Points
□ BLDR SLABS [16 pts] 0 □ SILT [3 pt] 0 □ □ BOULDER (>256 mm) [16 pts] 0 □ LEAF PACK/WOODY DEBRIS [3 pts] 0 □ □ BEDROCK [16 pts] 0 □ FINE DETRITUS [3 pts] 15 0 □ □ COBBLE (65-256 mm) [9 pts] 0 □ CLAY or HARDPAN [0 pts] 0 0 □ GRAVEL (2-64 mm) [9 pts] 0 □ MUCK [0 pts] 0 0 □ SAND (<2 mm) [6 pts]	Substrate Max = 40
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 6 TOTAL NUMBER OF SUBSTRATE TYPES 3	
 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) 	Pool Dept Max = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts] >22.5 - 30 cm [30 pts] ✓ >10 - 22.5 cm [25 pts] No Water or Moist Channel [0 pts]	5
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 4	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
 > 4.0 meters (>13') [30 pts] > 3.0 m - 4.0m (>9'7" - 13') [25 pts] > 1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] 	Max = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.4	15
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 >10 m Mature Forest, Wetland Conservation Tillage Urban or Industrial Narrow <5 m Residential, Park, New Field Open Pasture, Row Crop None Comments:	
FLOW REGIME (At time of evaluation) (Check ONLY one box): Steam flowing Image: Comments: 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 >3.0	
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)	ft)

QHEI PERFORMED	🗌 Yes 🖌 No	QHEI Score: 0	(If yes, attach co	mpleted QHEI form)		
DOWNSTREAM DESIGNATED USE(S)						
WWH Name:	Dista	ice from Evaluated Strea	m			
CWH Name:			Dista	ice from Evaluated Strea	m	
EWH Name:			Dista	ce from Evaluated Strea	m	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION						
JSGS Quadrangle Name: Martir	nsville	NRCS Soil	Map Page:	NRCS Soil Map Stream	n Order:	
County: Morgan		Township / City: Wa	ashington			
MISCELLANEOUS						
Base flow conditions? (Y/N)	No Date of last	precipitation: 2/5/2017		Quantity 0.54		
Photograph information:					_	
Elevated Turbidity? (Y/N) No	Canopy (%	6 open): 80				
Vere samples collected for water	r chemistry? (Y/N)	No (Note lab samp	le no. or id. and attac	h results) Lab number:	N/A	
Field Measures: Temp (C)	Dissolved c	oxygen (mg/l):	pH: Co	nductivity (umhos/cm):		
s the sampling reach representat	tive of the stream? ((/N) Yes If not, plea	ise explain:	_		
Additional comments/description	of pollution impacts:					
BIOTIC EVALUATI	ON					
Performed? (Y/N) No	(If Yes, record all obse ID number. Include ap	ervations. Voucher collections propriate field data sheets from	s optional. Note: all vou m the Primary Headwate	cher samples must be labele r Habitat Assessment Manu	ed with the sit al.)	
Fish observed? (Y/N)	Voucher? (Y/N)	Salamanders obser	ved? (Y/N)	Voucher? (Y/N)		
Frogs or tadpoles observed? (Y/N	N) Voucher?	Y (Y/N) Aquatic Ma	croinvertebrates obs	erved? (Y/N) Vou	ucher? (Y/N	

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





Stream S6S114c - facing downstream



Stream S6S114c - facing upstream

Stream S6S115



Stream Location on 2016 Aerial Photograph

Stream Location on Martinsville USGS Quadrangle

Basin:Clear Creek - East/West/Grassy ForkCounty:Morgan14-digit HUC:05120201140140Township:T12NDrainage area:0.021 sq. mi.Range:R1ELegal Drain:NoSection:26IDEM 303(d) Listed:NoQuarter:SEUSACE Jurisdiction:YesLatitude:39.44509IDEM Jurisdiction:YesLongitude:-86.386569	Stream Name:	UNT 19 West Fork Clear Creek	Quadrangle:	Martinsville
14-digit HUC:05120201140140Township:T12NDrainage area:0.021 sq. mi.Range:R1ELegal Drain:NoSection:26IDEM 303(d) Listed:NoQuarter:SEUSACE Jurisdiction:YesLatitude:39.44509IDEM Jurisdiction:YesLongitude:-86.386569	Basin:	Clear Creek - East/West/Grassy Fork	County:	Morgan
Drainage area:0.021 sq. mi.Range:R1ELegal Drain:NoSection:26IDEM 303(d) Listed:NoQuarter:SEUSACE Jurisdiction:YesLatitude:39.44509IDEM Jurisdiction:YesLongitude:-86.386569	14-digit HUC:	05120201140140	Township:	T12N
Legal Drain:NoSection:26IDEM 303(d) Listed:NoQuarter:SEUSACE Jurisdiction:YesLatitude:39.44509IDEM Jurisdiction:YesLongitude:-86.386569	Drainage area:	0.021 sq. mi.	Range:	R1E
IDEM 303(d) Listed: NoQuarter:SEUSACE Jurisdiction YesLatitude:39.44509IDEM Jurisdiction: YesLongitude:-86.386569	Legal Drain:	No	Section:	26
USACE Jurisdiction YesLatitude:39.44509IDEM Jurisdiction:YesLongitude:-86.386569	IDEM 303(d) Listed:	No	Quarter:	SE
IDEM Jurisdiction: Yes Longitude: -86.386569	USACE Jurisdiction	Yes	Latitude:	39.44509
	IDEM Jurisdiction:	Yes	Longitude:	-86.386569

Stream ID	Flow Regime	Channel Type	OHWM width (feet)	OHWM depth (feet)	Habitat Evaluation Score	Length of Impact* (feet)	Area of Impact* (acres)	Riparian Area (acres)
S6S115a	Ephemeral	Natural	4.90	0.60	HHEI = 41	69	0.01	0.14
S6S115b	Ephemeral	Culvert	3.30	0.50	N/A	59	<0.01	0.00
S6S115c	Ephemeral	Roadside Ditch	3.30	0.50	HHEI = 21	14	<0.01	0.00
Total						142	0.01	0.14

* Includes both permanent and temporary impacts

The OWHM of the UNT 19 to West Fork Clear Creek is 4.9 feet wide by 0.6 feet deep. The impacts to the UNT 19 to West Fork Clear Creek include replacing the existing 60 feet long by 24-inch diameter RCP carrying Twin Branch Road over the UNT 19 to West Fork Clear Creek with a new 70 feet long by 36 inch RCP (Structure P514) (8 cubic yards). Impacts to the UNT 19 to West Fork Clear Creek include 60 feet (0.005 acre) of existing encapsulation, 30 feet (0.003 acre) of revetment riprap placed in the channel for scour protection, 42 feet (0.005 acre) of open channel will remain following the installation of the new structure.

Approximately 142 feet (0.02 acre) of the UNT 19 to West Fork Clear Creek is located within the right-of-way for Twin Branch Road and may be impacted by the use of a temporary pump around following the typical diagram in Attachment #16. If necessary, the temporary pump would be in place for approximately 120 days. A temporary crossing may be installed in this channel during construction limited to 100 linear feet of channel impact. The temporary pump around will not be removed until the culvert outfall is stabilized with geotextile fabric and riprap. Channel and streambanks will be restored to a natural grade and planted with slope stabilization seed mix where appropriate. For reference see the Slope Stabilization Seed Mix included in Attachment 10.

A total of 40 feet of mitigation is being offered for all impacts not within the existing encapsulation of this stream and no mitigation is being offered for the 60 feet of existing encapsulation.

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3)	
SITE NAME/LOCATION UNT 19 West Fork Clear Creek	-
SITE NUMBER S6S115a RIVER BASIN Clear Creek - East/West/ DRAINAGE AREA (mi) 0.02	!1
LENGTH OF STEAM REACH (ft) LAT 39.44509 LONG86.386569 RIVER CODE N/A RIVER MILE N/A	_
DATE 12/6/2017 SCORER RKY COMMENT	_
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 presentCheck ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant subsrate types found (Max of 8). Final metric score is sum of boxes A and B.) HH TYPE PERCENT TYPE PERCENT PERCENT PERCENT	EI tric nts
□ BLDR SLABS [16 pts] 0	:rate = 40 1
Total of Percentages of Bildr Slabs, Boulder, Cobble, Bedrock 0.00% (A) (B) (A+I	B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES 9 TOTAL NUMBER OF SUBSTRATE TYPES 2	
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) Pool I	Depth = 30
>>30 centimeters [20 pts] >5 cm - 10 cm [15 pts] >22.5 - 30 cm [30 pts] <5 cm [5 pts]	5
COMMENTS: MAXIMUM POOL DEPTH (centimeters): 9	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bank > 4.0 meters (>13') [30 pts] >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] Wid > 3.0 m - 4.0m (>9'7" - 13') [25 pts] >1.5 m - 3.0 m(>9'7" - 4'8") [20 pts] >1.0 m (<=3'3") [5 pts]	kfull dth = 30
COMMENTS: AVERAGE BANKFULL WIDTH (Meters): 1.5	5
This information m <u>ust a</u> lso 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 >10 m Mature Forest, Wetland Conservation Tillage ✓ Moderate 5-10 m Mature Forest, Shrub or Old Field Urban or Industrial Narrow <5 m	
FLOW REGIME (At time of evaluation) (Check ONLY one box):	
 Steam flowing Subsurface flow with isolated pools (interstitial) 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 >3.0	
STREAM GRADIENT ESTIMATE ☐ Flat (0.5 ft/100 ft)	

		information must also be comple	
QHEI PERFORMED	Yes 🖌 No	QHEI Score: 0 (If yes, at	tach completed QHEI form)
DOWNSTREAM DE	SIGNATED USE(S)		
WWH Name:			Distance from Evaluated Stream
CWH Name:			Distance from Evaluated Stream
EWH Name:			Distance from Evaluated Stream
MAPPING: ATTACI	H COPIES OF MAPS, INC	CLUDING THE ENTIRE WATERSHED AREA	A. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: Mai	rtinsville	NRCS Soil Map Page:	NRCS Soil Map Stream Order:
ounty: Morgan		Township / City: Washington	
	IS		
ase flow conditions? (Y/N)	Yes Date of las	t precipitation: 12/5/2017	Quantity 0.54
notograph information:			
evated Turbidity? (Y/N)	No Canopy (%	% open): 30	
ere samples collected for wa	iter chemistry? (Y/N)	No (Note lab sample no. or id. ar	nd attach results) Lab number: N/A
eld Measures: Temp (C)) Dissolved o	oxygen (mg/l): pH:	Conductivity (umhos/cm):
the sampling reach represen	ntative of the stream? (Y/N) Yes If not, please explain:	
dditional comments/descriptic	on of pollution impacts:		
•			
BIOTIC EVALUA			
erformed? (V/N) No	(If Yes, record all obse	ervations Voucher collections optional Note	e [,] all voucher samples must be labeled with the site
	ID number. Include a	propriate field data sheets from the Primary H	leadwater Habitat Assessment Manual.)
sh observed? (Y/N)	Voucher? (Y/N)	Salamanders observed? (Y/N)	Voucher? (Y/N)
ogs or tadpoles observed? (Y/N) Voucher?	? (Y/N) Aquatic Macroinvertebrat	tes observed? (Y/N) Voucher? (Y/N)

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





Stream S6S115a - facing downstream



Primary Headwater Habitat Evaluation Form

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

21

SITE NAME/LOCATION UNI 19 West Fork Clear Cree	ek	
SITE NUMBER S6S115c	RIVER BASIN Clear Creek - East/West/ DRAINAGE AREA (m	ni) 0.021
LENGTH OF STEAM REACH (ft) LAT	39.4454 LONG86.386904 RIVER CODE N/A RIVER N	MILE N/A
DATE 12/6/2017 SCORER RKY 0		
NOTE: Complete All Items On This Form - Refer to "	"'Field Evaluation Manual for Ohio's PHWH Streams" for Instructi	ions
1. SUBSTRATE (Estimate percent of every type of (Max of 32). Add total number of significant subsra	substrate presentCheck ONLY two predominant substrate TYPE box ate types found (Max of 8). Final metric score is sum of boxes A and E	xes 3.) HHEI
TYPE PERCENT	TYPE PERCENT	Points
BLDR SLABS [16 pts] 0 BOULDER (>256 mm) [16 pts] 0	SILT [3 pt] LEAF PACK/WOODY DEBRIS [3 pts]	Substrate
BEDROCK [16 pts]	FINE DETRITUS [3 pts] CLAY or HARDPAN [0 pts] 0	Max = 40
GRAVEL (2-64 mm) [9 pts]		11
	ARTIFICIAL [5 pis]	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00%	(A) Check 100 % (B)	(A+B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE	TYPES 9 TOTAL NUMBER OF SUBSTRATE TYPES 2	
2. MAXIMUM POOL DEPTH (Measure the maximu evaluation. Avoid plunge pools from road culverts	um pool depth within the 61 meter (200 ft)evaluation reach at the tim is or storm water pipes)	ne of Pool Depti Max = 30
>>30 centimeters [20 pts]	>5 cm - 10 cm [15 pts]	
>22.5 - 30 cm [30 pts] >10 - 22.5 cm [25 pts]	 S cm [5 pts] No Water or Moist Channel [0 pts] 	5
COMMENTS:	MAXIMUM POOL DEPTH (centimeters): 4	╡║└━━━┛
3. BANK FULL WIDTH (Measured as the ave	erage of 3-4 measurements) (Check ONLY one box):	Bankfull
 BANK FULL WIDTH (Measured as the average of the second seco	erage of 3-4 measurements) (Check ONLY one box): →1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
BANK FULL WIDTH (Measured as the average of the second s	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the ave	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the ave	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second sec	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1 information must also be completed	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second sec	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1 information must also be completed LITY NOTE: River left (L) and Right (R) as looking downstrean DELAIN OUALITY	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second sec	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1 information must also be completed LITY NOTE: River left (L) and Right (R) as looking downstrean DPLAIN QUALITY (Most Predominant Per Bank) L R	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1 information must also be completed LITY NOTE: River left (L) and Right (R) as looking downstrean DPLAIN QUALITY (Most Predominant Per Bank) L R Mature Forest, Wetland Conservation Tillage	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1 information must also be completed LITY NOTE: River left (L) and Right (R) as looking downstrean DPLAIN QUALITY (Most Predominant Per Bank) L R Mature Forest, Wetland Immature Forest, Shrub or Old Field Water Forest, Shrub or Old Field Open Pasture, Row Completed Description	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] ✓ >1.0 m (<=3'3") [5 pts]	Bankfull Width Max = 30
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] >1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1 information must also be completed LITY NOTE: River left (L) and Right (R) as looking downstrean DPLAIN QUALITY (Most Predominant Per Bank) L R Mature Forest, Wetland Immature Forest, Shrub or Old Field Immature Forest, Shrub or Old Field Conservation Tillage Immature Forest, Shrub or Old Field Fenced Pasture (Check ONLY one box): Moist channel, isolated pools, no flow (Intermediated pools)	Bankfull Width Max = 30 5
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 5 m
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts] AVERAGE BANKFULL WIDTH (Meters): 1 information must also be completed LITY NOTE: River left (L) and Right (R) as looking downstrean OPLAIN QUALITY (Most Predominant Per Bank) L R Mature Forest, Wetland Immature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture (Check ONLY one box): a) Moist channel, isolated pools, no flow (Intermal) Check ONLY one box): 200 ft) of channel, Check ONLY one box)	Bankfull Width Max = 30 5
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 5
3. BANK FULL WIDTH (Measured as the average of the second se	erage of 3-4 measurements) (Check ONLY one box): >1.0 m - 1.5m (>3'3" - 4'8") [15 pts] <=1.0m (<=3'3") [5 pts]	Bankfull Width Max = 30 5

QHEI PERFORMED Ves V No QHEI Score: 0 (If yes	s, 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: Martinsville NRCS Soil Map Page	e: NRCS Soil Map Stream Order:					
County: Morgan Township / City: Washingtor	n					
Base flow conditions? (Y/N) Yes Date of last precipitation: 12/5/2017	Quantity 0.54					
Photograph information:						
Elevated Turbidity? (Y/N) No Canopy (% open): 90						
Were samples collected for water chemistry? (Y/N) No (Note lab sample no. or id	d. and attach results) Lab number: N/A					
Field Measures: Temp (C) Dissolved oxygen (mg/l): pH:	Conductivity (umhos/cm):					
Is the sampling reach representative of the stream? (Y/N) Yes If not, please explain	n:					
Additional comments/description of pollution impacts:						
BIOTIC EVALUATION						
Performed? (Y/N) No (If Yes, record all observations. Voucher collections optional. ID number. Include apropriate field data sheets from the Prima	Note: all voucher samples must be labeled with the sit ary Headwater Habitat Assessment Manual.)					
Fish observed? (Y/N) Voucher? (Y/N) Salamanders observed? (Y/N	N) Voucher? (Y/N)					
	ebrates observed? (Y/N) //oucher? (Y/N)					
Frogs or tadpoles observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverte						

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

PT	TA	1. corty perol	N & M	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	A
18	MA	Loves /	The second second	Thous	e N
	[] landy	.07	EC.	Slogen	
	11 600	cess 3/ /(1.	2	



Stream S6S115c - facing downstream



Stream S6S115c - facing upstream

Section 6— Reevaluation Statement #1



Appendix D – Agency Coordination



100 North Senate Avenue Room N755 Indianapolis, Indiana 46204

PHONE: (317) 881-6408

Eric Holcomb, Governor Joe McGuinness, Commissioner

July 18, 2018

«Name», «Title» «Organization» «Address» «Address2» «City_State_ZIP»

Re: Des. No. 0500430 Contracts R-40848 & R-33493 I-69 Section 6 Reevaluation No. 1 I-69 Section 6 – Martinsville Design Contract From Indian Creek via SR 37 to 1 mile north of SR 44 Martinsville, Morgan County, Indiana

«Name»:

The Indiana Department of Transportation (INDOT) and the Federal Highway Administration (FHWA) completed the Final Environmental Impact Statement and Record of Decision (FEIS/ROD) for I-69 Section 6 on February 1, 2018, affirming the Refined Preferred Alternative along SR 37. INDOT has determined I-69 Section 6 should be designed and constructed in phases. After approval of the FEIS/ROD, INDOT advanced the City of Martinsville portion of I-69 Section 6 to preliminary and final design in multiple construction contracts. The remainder of the project north of Martinsville will be advanced to design in one or more stages beginning in late 2018.

As part of the preliminary design and in coordination with utilities and the City of Martinsville, it was determined that minor changes to the roadway alignments as approved in the FEIS would be required. This letter is to update your agency on the design modifications and seek input during the environmental re-evaluation review process. We request comments from you within your area of expertise regarding any potential environmental or community effects associated with this proposed project. **Please use the above designation number and description in your reply.** We will incorporate your comments into the re-evaluation of the project's environmental effects.

Proposed Project: The proposed project is to construct I-69 Section 6 within Martinsville as approved in the FEIS/ROD issued by FHWA and INDOT including interchanges and local roadway improvements. Minor shifts or extensions of alignment and the inclusion of two new local roadways will be included in the project. Proposed local roadways would be required to accommodate traffic diverted during construction and to enhance the local roadway network connectivity both during construction and post construction.

Project Location: INDOT will construct I-69 Section 6, a new interstate facility, from the terminus of I-69 Section 5 south of Indian Creek and the city of Martinsville, north to I-465 in Indianapolis including improvements to I-465 (Figure 1). Construction Contract 1 (Contract R-40848) includes local access roads within Martinsville including Grand Valley Boulevard and South Street from South Home Avenue east to Cramertown Loop including a new bridge over I-69, a new roadway called Artesian Avenue from Grand Valley Boulevard south and east to East Mahalasville Road, Cramertown Loop from the intersection with Grand Valley Boulevard north past Crestview Drive, and advanced tree clearing for Contract 2.

Construction Contract 2 (Contract R-33493) includes I-69 mainline roadway, bridges, and culverts from Indian Creek via SR 37 to 1 mile north of SR 44; interchanges at SR 39, Ohio Street, SR 252, and SR 44; local access roadways including Old SR 37, Rogers Road, Commercial Boulevard, Mahalasville Road, Bill's Boulevard, Kristi Road, Southview Drive, Cramertown Loop Road, and Twin Branch Road, and the relocation of Sartor Ditch.







100 North Senate Avenue Room N755 Indianapolis, Indiana 46204

PHONE: (317) 881-6408

Eric Holcomb, Governor Joe McGuinness, Commissioner

Purpose and Need: The purpose of the project is to complete I-69 Section 6 within Martinsville and to improve local roadways and connectivity within Martinsville as part of I-69 Section 6. These improvements are needed to accommodate traffic diverted during construction and to enhance the local roadway network connectivity both during construction and post construction. These improvements were included in the original FEIS/ROD with the exception of the improvements to Cramertown Loop and the extension of Southview Drive.

Project Changes After the I-69 Section 6 FEIS/ROD: The following is a summary of the changes that have occurred to the initial project design since the FEIS was approved. Two new local roadways are being added to the project and modifications to proposed interchanges are the most substantial changes to the project; however, there are also minor changes to the proposed right-of-way and bridge sizes or type. For reference to changes in the proposed right-of-way see the attached mapping. Limited access and local right-of-way as approved in the FEIS/ROD is highlighted in pink, limited access, local road, temporary, and utility right-of-way as currently proposed is highlighted with a cross hatch. Parcels which have been identified through the property acquisition process as being acquired in whole as excess land are indicated with a stripe. The roadway as reflected in the current design is indicated in yellow.

Improvements to Cramertown Loop were not included in the I-69 Section 6 FEIS. Cramertown Loop from SR 252 south to Grand Valley Boulevard was identified by the City of Martinsville as a local roadway in need of improvement during coordination completed after the FEIS/ROD. Improvements were identified because of the existing conditions which include inadequate sight distance along Cramertown Loop, poor pavement condition, lack of pedestrian facilities, lack of adequate drainage, and lack of traffic control at the intersection with SR 252. Cramertown Loop is anticipated to be utilized by vehicular traffic including heavy trucks accessing Grand Valley Center. The Cramertown Loop improvements will include reconstruction of the existing roadway just east of the current roadway and correction of existing vertical geometric deficiencies. This roadway improvement will require approximately 10 acres of additional right-of-way and one single family home. The single family home is being acquired due to unavoidable impacts to the existing septic system on the parcel. For reference see Figure 2 – Page 8 of 10.

Southview Drive from the Ohio Street interchange south of Burton Lane was not identified as a local roadway improvement in the FEIS/ROD. Southview Drive from Burton Lane south to the SR 39 interchange was identified by the City of Martinsville as a local roadway in need of improvement/extension during coordination completed after the FEIS/ROD. Improvements were identified on Southview Drive in order to provide local roadway connectivity resulting from the closure of Burton Lane at SR 37. Southview Drive south of Burton Lane is currently a private roadway south to Centerstone Behavioral Health Clinic. The Southview Drive improvements will reconstruct Southview Drive as a local roadway south of Burton Lane and extend the roadway south of Centerstone Behavioral Health Clinic to the SR 39 interchange. This roadway improvement will require approximately 4 acres of additional right-of-way. For reference see Figure 2 – Pages 2 and 3 of 10.

Additional changes from the FEIS/ROD include minor shifts in the alignments, extension of alignments, or alterations to the interchange type. These include the following.

- Addition of right-of-way along the west side of the proposed I-69 from just south of Indian Creek to SR 39. This right-of-way will be used for multiple utilities. For reference see Figure 2 Pages 1 and 2 of 10.
- The existing Indian Creek Overflow structure will be removed. This will require, removal of a portion of the elevated section of Old SR 37 just north of the Morgan County Bridge #224 over Indian Creek in order to provide for flow through the Indian Creek floodway. The asphalt roadbed and elevated roadway embankment will be removed and replaced at the existing ground level with a gravel roadbed. This roadway improvement will require approximately 2 acres of additional temporary right-of-way. A flood easement will be acquired downstream of the Indian Creek bridge. For reference see Figure 2 Pages 1 and 2 of 10.
- Eliminate the extension of Rogers Road. The removal of this roadway will eliminate the need for approximately 12 acres of local access right-of-way. For reference see Figure 2 Pages 1 and 2 of 10.
- Shifting of the SR 39 interchange ramps to the south in order to remove the skew from the bridges carrying SR 39 under I-69 Mainline. No additional right-of-way is required. For reference see Figure 2 Page 2 of 10.

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- Changing the Ohio Street interchange type from a diamond with roundabouts to a traditional diamond interchange. Ohio Street will switch from going over I-69 to under I-69. No additional right-of-way is required. The change in the Ohio Street interchange resulted in the 5 less residential property acquisitions. For reference see Figure 2 Page 4 of 10.
- Unnamed Tributary (UNT) 1 to Sartor Ditch and Sartor Ditch will both be relocated within and adjacent to the Ohio Street interchange in order to accommodate roadway widening and to better accommodate the flow paths of the streams. As a result of the Sartor Ditch relocation, the existing bridge at Southview Drive will be replaced in addition to a new crossing of Ohio Street over Sartor Ditch. The channel relocation will require approximately 1 acre of additional right-of-way. For reference see Figure 2 Page 4 of 10.
- Artesian Avenue will be shifted slightly in order to avoid utility impacts. No additional right-of-way is required; however, the right-of-way lines are shifted slightly. For reference see Figure 2 Pages 6 and 7 of 10.
- The existing culvert at South Street over Sartor Ditch will be replaced with a three-span bridge to help improve hydraulic conditions in the area. A third span has been added to the Grand Valley Boulevard bridge over I-69 to act as an overflow structure to Sartor Ditch. No additional right-of-way is required. For reference see Figure 2 Page 4 of 10.
- The intersection of Cramertown Loop and SR 252 will be converted to a roundabout. A minor strip of additional right-of-way will be required and is included in the additional right-of-way required for Cramertown Loop. For reference see Figure 2 Page 8 of 10.
- The SR 252 interchange will change from a traditional diamond interchange to a diamond interchange with roundabout intersections. No additional right-of-way is required. For reference see Figure 2 Page 8 of 10.
- Twin Branch Road will be extended south to SR 44 instead of the originally proposed intersection with Old SR 44. Approximately 1 acre of additional right-of-way will be required. Twin Branch Road will be reconstructed as a local roadway. The current roadway is partially a private roadway. Approximately 6 acres of additional local roadway right-of-way will be required. For reference see Figure 2 – Page 9 of 10.

Resource Impacts: Land use in the vicinity of the project is primarily agricultural, commercial, and residential. The addition of the Cramertown Loop improvements will include the replacement of an existing culvert carrying UNT 6 to Sartor Ditch and additional impacts to primarily agricultural lands. The addition of Southview Drive will include additional impacts to open water and wetland resources and additional impacts primarily to agricultural and fallow land. No additional relocations are anticipated as a result of the additional roadway construction at Cramertown Loop or Southview Drive.

The following table indicates differences in impacts to key resources from the FEIS to the currently proposed alternative within the Design Contract 1 area around the city of Martinsville. There are no impacts in the City of Martinsville to private managed lands, core forest, or wellhead protections areas. Impacts to wetlands, floodplains, and streams are anticipated to increase while impacts to floodways and public managed lands are anticipated to decrease. The number of relocations is anticipated to be reduced by 5 along Ohio Street. The Evening Lions Club at Cramertown Loop and SR 252 was included in the FEIS as a potential relocation and has been confirmed as a relocation.

Table 1: Reevaluation No. 1 - Key Resource Impact Changes in the City of Martinsville

Resource	FEIS Refined Preferred Alternative Impacts	Design Contract Impacts	Difference
Wetlands	0.70 acre	0.81 acre	0.11 acre
Floodway	46.95 acres	43.53 acres	-3.42 acres
Floodplain	52.31 acres	57.68 acres	5.38 acres
Streams	15,566 feet	17,827 feet	2,260 feet





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Resource	FEIS Refined Preferred Alternative Impacts	Design Contract Impacts	Difference
Core Forest	0 acre	0 acre	0 acre
Public Managed Lands	2.04 acres	1.16 acres	-0.88 acre
Relocations – Commercial	24	24	0
Relocations – Non-Profit	2	2	0
Relocations – Duplex	6	6	0
Relocations – Mobile Home	2	3	+1
Relocations – Multi-Family	4	4	0
Relocations – Single Family	55	52	-3
Total Relocations	93	90	-3

Cultural Resources: An archaeological investigation has been completed within the additional project area outside the archaeological Area of Potential Effects (APE) for the I-69 Section 6 project. No new sites were discovered which have been recommended as eligible for inclusion on the National Register of Historic Places (NRHP). This document will be submitted to IDNR-Division of Historic Preservation in a separate submittal.

All areas within the re-evaluation where included in the original APE for above ground resources for the I-69 Section 6 project. No change to the finding of effect is anticipated. A request for concurrent will be submitted to IDNR-Division of Historic Preservation in a separate submittal.

Aesthetics and Design: As part of the design work, the city of Martinsville and INDOT have prepared conceptual design elements including visual representations of an entrance monument, sound and retaining walls, and bridge and overpass elements. These design elements were selected by the Aesthetics Task Force and public surveys will be competed to selected the final design elements. Features are brick and limestone which will be unique along the southern portion of the I-69 corridor. The online aesthetics survey can be found at www.in.gov/indot/projects/i69/2346.htm.

Comments Request: You are asked to review this information and provide any comments you may have relative to the anticipated effects of the project on areas which you have jurisdiction or special expertise. Should we not receive your response **within thirty (30) calendar days** from the date of this letter, it will be assumed that your agency feels that there will be no adverse effects incurred as a result of the proposed project. However, should you find that an extension to the response time is necessary, a reasonable amount may be granted upon request. If you have any questions regarding this matter, please feel free to contact Jim Earl, INDOT, at <u>JEARL@indot.IN.gov</u> or 317-233-2072 or Christine Meador, HNTB Corporation, at <u>CMEADOR@HNTB.com</u> or 317-917-5338. Thank you in advance for your input.

Sincerely yours,

Jomes allen Soul I

James A. Earl, II, P.E. I-69 Section 6 Project Manager

cc: I-69 Section 6 Project File

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PHONE: (317) 881-6408

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Attachments:Figure 1: Project Location MapFigure 2: Design Contract 1 – Overview

Cc: Ms. Michelle Allen, FHWA

Ms. Martha Clark Mettler, Deputy Assistant Commissioner, Indiana Department of Environmental Management Mr. Jim Sullivan, Director, Indiana Department of Environmental Management, Ground Water Section

Mr. Randy Braun, Section Chief, IDEM OWQ

Mr. Jason Randolph, Project Manager, IDEM OWQ

Mr. Matt Buffington, Environmental Supervisor, IDNR - Division of Fish and Wildlife

Ms. Christy Stanifer, Environmental Coordinator, Indiana Department of Natural Resources

Mr. Ron Bales, Sr. Env. Manager, INDOT

Ms. Marlene Mathas, Site Assessment & Management (SAM), INDOT

Mr. Patrick Carpenter, Cultural Resources, INDOT

Ms. Laura Hilden, Environmental Services, INDOT

Ms. Crystal Rehder, Environmental Services, INDOT

Ms. Deborah Snyder, Project Manager, U.S. Army Corps of Engineers

Mr. Scott Pruitt, US Fish & Wildlife Service, Field Supervisor, U.S. Department of Interior, Bloomington Field Office

Ms. Robin McWilliams-Munson, US Fish & Wildlife Service, U.S. Department of Interior, Bloomington Field Office

Mr. Kenneth Westlake, Chief of NEPA Implementation Section, US Environmental Protection Agency, Region 5

Ms. Virginia Laszewski, NEPA Implementation Section, US Environmental Protection Agency, Region 5

Ms. Jane Hardisty, Indiana State Conservationist, USDA Natural Resources Conservation Service

Mr. Larry Smith, Morgan County Engineer, Morgan County

Chief Terry Anderson, Martinsville Fire Department

Ms. Tosha Daugherty, Director, Visit Morgan County

Mr. Kenny Hale, Director of Planning, Morgan County

Mr. Ross Holloway, Engineer, City of Martinsville

Ms. Katelyn Hurt, Executive Director, Morgan County EDC

Mayor Shannon Kohl, City of Martinsville

Chief Rick Lang, Martinsville Police Dept.

Dr. Michele Moore, Superintendent, Martinsville School Corporation

Ms. Jamie Thompson-Taylor, Executive Director, Martinsville Chamber of Commerce

Mr. Norman Voyles, Commissioner, Morgan County

Mr. Craig Demontt, City of Martinsville



I-69 Section 6 Right of Way
Martinsville Design Contract ROW

Indiana Counties

Early Acquisition - Cramertown Loop







	Contract 1 Limited Access ROW		FEIS Limited Access ROW	Delineated Wetlands	+ [†] +	Cemetery ᆎ Fire Station	n	MARTINSVILLE	
n N	Contract 1 Local ROW		FEIS Local ROW	Floodway	đ	Church		FEIS REEVALUATION	N
E	Contract 1 Temporary ROW		Contract 1 Parcel Acquistion/Land Lock	Pavement	_	Bridges & Retaining Walls	0	500 1,000)
Ś	Contract 1 Utility ROW	ХХ	Roads Closed or Removed	Driveway		Streams		Fe	et



N	Contract 1 Limited Access ROW		FEIS Limited Access ROW	Delineated Wetlands	+†+	Cemetery ᆎ Fire Static	n	MARTINSVILLE
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N	Contract 1 Limited Access ROW		FEIS Limited Access ROW	Delineated Wetlands	+†+	Cemetery 💼 Fire Statio	on	MARTINSVILLE
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	Contract 1 Limited Access ROW		FEIS Limited Access ROW	Delineated Wetlands	+†+	Cemetery 📅 Fire Statio	n	MARTINSVILLE
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Ś	Contract 1 Utility ROW	ΧХ	Roads Closed or Removed	Driveway		Streams		Feet



	Contract 1 Limited Access ROW		FEIS Limited Access ROW	Delineated Wetlands	+†+	Cemetery ᆎ Fire Station	ı	MARTINSVILL	E
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4	Contract 1 Limited Access ROW		FEIS Limited Access ROW	Delineated Wetlands	+ [†] +	Cemetery 📅 Fire Statio	n	MARTINSVILLE
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V T	Contract 1 Utility ROW	ХХ	Roads Closed or Removed	Driveway		Streams		Feet

From:	RANDOLPH, JASON
To:	Earl, James; Christine Meador
Cc:	"Allen, Michelle (FHWA)"; Hilden, Laura; Braun, Randy
Subject:	RE: I-69 Section 6 Re-Evaluation
Date:	Thursday, July 19, 2018 12:53:11 PM
Attachments:	image001.png
	image002.png
	image003.png
	image004.png
	image005.gif
Importance:	High

Mr. Earl:

IDEM has reviewed your letter dated July 18, 2018, requesting agency comments on the minor redesigns to the Martinsville portion of I-69 Section 6. These minor redesigns were not included in the Final Environmental Impact Statement or in the Record of Decision recorded for this project on February 1, 2018.

Based upon review of the submitted information, IDEM does not have any specific comments regarding the redesign. The change in impacts are minor in nature compared to the overall impacts associated with I-69. Please make sure the additional impacts to wetlands and streams are accounted for in the Section 401 Water Quality Certification application and appropriate compensatory mitigation is provided.

Thank you for coordinating with the agency and allowing us to review and comment on the redesign. If you have any questions feel free to contact me via email or at the phone number listed below. Thank you,

Jason Randolph IDEM-OWQ 317-233-0467

From: Christine Meador [mailto:CMeador@HNTB.com]
Sent: Thursday, July 19, 2018 8:28 AM
To: RANDOLPH, JASON <JRANDOLP@idem.IN.gov>
Subject: I-69 Section 6 Re-Evaluation

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

The Indiana Department of Transportation (INDOT) and the Federal Highway Administration (FHWA) completed the Final Environmental Impact Statement and Record of Decision (FEIS/ROD) for I-69 Section 6 on February 1, 2018, affirming the Refined Preferred Alternative along SR 37. INDOT has determined I-69 Section 6 should be designed and constructed in phases. After approval of the FEIS/ROD, INDOT advanced the City of Martinsville portion of I-69 Section 6 to preliminary and final design in multiple construction contracts. The remainder of the project north of Martinsville will be

advanced to design in one or more stages beginning in late 2018.

As part of the preliminary design and in coordination with utilities and the City of Martinsville, it was determined that minor changes to the roadway alignments as approved in the FEIS would be required. This letter is to update your agency on the design modifications and seek input during the environmental re-evaluation review process. We request comments from you within your area of expertise regarding any potential environmental or community effects associated with this proposed project. Please use the above designation number and description in your reply. We will incorporate your comments into the re-evaluation of the project's environmental effects.

You are asked to review this information and provide any comments you may have relative to the anticipated effects of the project on areas which you have jurisdiction or special expertise. Should we not receive your response within thirty (30) calendar days from the date of this letter, it will be assumed that your agency feels that there will be no adverse effects incurred as a result of the proposed project. However, should you find that an extension to the response time is necessary, a reasonable amount may be granted upon request. If you have any questions regarding this matter, please feel free to contact Jim Earl, INDOT, at JEARL@indot.IN.gov or 317-233-2072 or Christine Meador, HNTB Corporation, at <u>CMEADOR@HNTB.com</u> or 317-917-5338. Thank you in advance for your input.

Sincerely yours, Chris

Christine Meador

Assistant Department Manager Environmental Planning Tel (317) 636-4682 Cell (317) 459-3629 Direct (317) 917-5338 Email <u>cmeador@hntb.com</u>

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United States Department of the Interior Fish and Wildlife Service

Indiana Field Office (ES) 620 South Walker Street Bloomington, IN 47403-2121 Phone: (812) 334-4261 Fax: (812) 334-4273

July 31, 2018

Mr. James Earl I-69 Section 6 Project Manager Indiana Department of Transportation 100 North Senate Avenue, Room N755 Indianapolis, IN 46204

Dear Mr. Earl:

This is in response to your letter dated July 18, 2018, regarding minor alignment changes for Section 6 of the I-69 project in Morgan County. The alignment changes are a result of updated design and utility information for a segment of Section 6 within the City of Martinsville. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, as amended, and the U. S. Fish and Wildlife Service's Mitigation Policy.

According to you letter, two new local roadways are being added to the project along with some modifications to proposed interchanges; there are also some minor changes to the proposed right-of-way and bridge sizes or type. Based on correspondence with Christine Meador from HNTB Corporation, these changes will result in an additional 3.2 acres of forest impact, 0.11 acres of wetland impact, 5.38 acres of floodplain impact, and 2,260 linear feet of stream impacts. There is a 3.42 acre reduction in floodway impacts.

The Federal Highway Administration (FHWA) and the Indiana Department of Transportation (INDOT) formally consulted on Section 6 of the I-69 highway project in 2017 which resulted in the issuance of a biological opinion dated October 30, 2017. Per the biological opinion, approximately 210 acres of forest impacts (upland and forested wetland) are anticipated for Section 6. To avoid reinitiation of consultation, impacts may not exceed 10% of the anticipated amount of clearing (*i.e.* 231 acres) and no clearing should occur during the summer maternity season (April 1-September 30). As long as the reinitiation trigger is not met and all of the Terms and Conditions set forth within the biological opinion are implemented, we do not have any additional concerns or comments regarding these recent minor project modifications.

We appreciate the opportunity to continue to participate in the Section 6 project development. If you have any questions about our recommendations, please contact Robin McWilliams Munson at (812) 334-4261 (Ext. 207) or robin_mcwilliams@fws.gov.

Sincerely,

Scott E. Pruitt Field Supervisor

Cc: Michelle Allen, FHWA, Indianapolis Christine Meador, HNTB, Indianapolis, Indiana (via email)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

AUG 1 5 2018

REPLY TO THE ATTENTION OF:

James A. Earl, II, P.E. 1-69 Section 6 Project Manager Indiana Department of Transportation 100 North Senate Avenue Room N755 Indianapolis, Indiana 46204

RE: Des. No. 0500430
 Contracts R-40848 & R-33493
 I-69 Section 6 Re-evaluation No. 1
 I-69 Section 6 – Martinsville Design Contract
 From Indian Creek via SR 37 to 1 mile north of SR 44
 Martinsville. Morgan County. Indiana

Dear Mr. Earl:

The U.S. Environmental Protection Agency Region 5 (EPA) received your July 18, 2018, letter with information regarding the Indiana Department of Transportation's (INDOT) re-evaluation of a portion of Section 6 of the I-69 (Indianapolis to Evansville) Project near Martinsville. As requested, EPA reviewed the information and has the following comments.

Your letter identifies that, as part of the preliminary design and coordination with utilities and the City of Martinsville, INDOT determined that minor changes to the roadway alignments as approved in the Federal Highway Administration (FHWA) I-69 (Indianapolis to Evansville) Tier 2 Section 6 Final Environmental Impact Statement/Record of Decision (FEIS/ROD) were required. Two new local roadways have been added and modifications to proposed interchanges are the most substantial changes to the project. There are also minor changes to the proposed right-of-way and bridge sizes or type.

When compared to impacts identified in the FEIS/ROD, the proposed changes would decrease floodway impacts by 3.42 acres. However, wetland and floodplain impacts would increase by 0.11 and 5.38 acres, respectively. Stream impacts would increase by 2,260 feet. Information EPA received via email (August 08, 2018, 3:51 PM) from Christine Meador of HNTB discloses 3.2 acres of additional forest land impacts. Mitigation for these additional resource impacts is not discussed in the re-evaluation information. EPA recommends INDOT identify and discuss how proposed mitigation will account for the new impact calculations to these resources, especially for the addition of 2,260 feet of stream impacts. Modifications to aquatic resources mitigation should be reflected in the project's Clean Water Act Section 404 permit application to the Corps of Engineers.

Recycled/Recyclable . Printed with Vegetable Oll Based Inks on 100% Recycled Paper (100% Post-Consumer)
EPA appreciates the opportunity to comment on the re-evaluation. As other portions of Section 6 proceed to design, if additional reevaluations are undertaken, we would welcome the opportunity to comment on them. If you have any questions about EPA's comments, please contact me or Virginia Laszewski of my staff at 312-886-7501 and at laszewski.virginia@epa.gov.

Sincerely,

778

Kenneth A. Westlake, Chief NEPA Implementation Section Office of Enforcement and Compliance Assurance

cc (email):

FHWA-Indiana Division - Michelle Allen, Project Manager, <u>michelle.allen@dot.gov</u>
U.S. Army Corps of Engineers - Debra Snyder, <u>deborah.d.snyder@usace.army.mil</u>
U.S. Fish and Wildlife Service, Region 3, Bloomington Ecological Services Scott Pruitt, Field Supervisor, <u>scott_pruitt@fws.gov</u>, Robin McWilliams-Munson, <u>robin_mcwilliams@fws.gov</u>
HNTB Corporation, Christine Meador, <u>CMEADOR@HNTB.com</u>

2



August 22, 2018

James A. Earl, II, P.E. 100 North Senate Avenue, Room N755 Indianapolis, Indiana 46204

Dear Mr. Earl:

The proposed project to construct I-69 Section 6 within Martinsville in Morgan County, Indiana (Des. No. 0500430), as referred to in your letter received July 18, 2018, will cause a conversion of prime farmland.

The attached packet of information is for your use completing Parts VI and VII of the AD-1006. After completion, the federal funding agency needs to forward one copy to NRCS for our records.

If you need additional information, please contact Rick Neilson at 317-295-5875.

Sincerely,

Digitally signed by JERRY JERRY RAYNOR Date: 2018.09.07 07:59:13 RAYNOR -04'00'

JERRY RAYNOR State Conservationist

Enclosures

F	U.S. Departme	nt of Agri SION	culture	ATING					
PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request							
Name of Project		Federal Agency Involved							
Proposed Land Use		County and State							
PART II (To be completed by NRCS)		Date Request Received By		Ву	Person Completing Form:				
Does the site contain Prime, Unique, Statewide or Local Important Farmland? (If no, the FPPA does not apply - do not complete additional parts of this form)			TES NO Acres		rigated Average Farm Size				
Major Crop(s)	Farmable Land In Govt.	Farmable Land In Govt. Jurisdiction Acres: %			Amount of Farmland As Defined in FPPA Acres: %				
Name of Land Evaluation System Used	Name of State or Local S	Name of State or Local Site Assessment System				Date Land Evaluation Returned by NRCS			
PART III (To be completed by Federal Agency)				Alternative Site Rating					
A. Total Acres To Be Converted Directly				Site A	Site B	Site C	Site D		
B. Total Acres To Be Converted Indirectly									
C. Total Acres In Site									
PART IV (To be completed by NRCS) Lan	d Evaluation Information								
A. Total Acres Prime And Unique Farmland									
B. Total Acres Statewide Important or Local Important Farmland									
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted									
D. Percentage Of Farmland in Govt. Jurisdi	ction With Same Or Higher Relati	ive Value							
PART V (To be completed by NRCS) Land Relative Value of Farmland To Be C	l Evaluation Criterion onverted (Scale of 0 to 100 Points	s)							
PART VI (To be completed by Federal Agency) Site Assessment Criteria (Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)			(15) Maximum	Site A	Site B	Site C	Site D		
1. Area In Non-urban Use			(13)						
2. Perimeter In Non-urban Use			(10)						
3. Percent Of Site Being Farmed			(20)						
4. Protection Provided By State and Local Government			(20)						
5. Distance From Urban Built-up Area			(15)						
b. Distance To Urban Support Services			(10)						
7. Size Of Present Farm Unit Compared To Average			(10)						
8. Creation Of Non-farmable Farmland			(10)						
9. Availability of Farm Support Services			(20)						
10. On-Faim investments			(10)						
11. Enects Of Conversion On Farm Support Services			(10)						
			160						
PART VII (To be completed by Federal Arona)									
Relative Value Of Farmland (From Part V)			100						
Total Site Assessment (From Part VI above or local site assessment)			160						
TOTAL POINTS (Total of above 2 lines)			260						
Site Selected:	Date Of Selection			Was A Local Site Assessment Used?					
Reason For Selection:				I					

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

- Step 1 Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.
- Step 2 Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM (For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

- 1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
- 2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.
- Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).
- 1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
- 2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160. Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

 $\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.