

**2010 Study Plan for Sandy Creek and Direct Tributaries  
(Columbiana, Carroll, Stark and Tucarawas Counties, OH)**

**State of Ohio Environmental Protection Agency  
Division of Surface Water  
Lazarus Government Center  
122 South Front St., Columbus, OH 43215**

**Mail to:  
P.O. Box 1049, Columbus, OH 43216-1049  
&  
Monitoring and Assessment Section  
4675 Homer Ohio Lane  
Groveport, OH 43125  
&  
Surface Water Section  
  
Northeast District Office  
2110 Aurora Rd.  
Twinsburg, OH 44087**

## Introduction

As part of the five-year basin approach for NPDES permitting and the TMDL process, an intensive ambient assessment will be conducted during the 2010 field sampling season within the Sandy Creek and Tributaries.. The study area will include 20 sites on Sandy Creek, three sites on Huggle Run, Still Fork, and Middle Branch of Sandy Creek. The study will also assess fifteen sites on tributaries entering Sandy Creek, Little Sandy Creek and the Still Fork. A total of 50 sampling stations will be assessed in this survey. Table 2 contains a list of all the NPDES facilities within the study area. These facilities will be targeted for evaluation of their potential aquatic influences. Ambient biology, macrohabitat quality, water column chemistry, and bacteriological data will be collected from every site.

Site areas that have been previously sampled and evaluated by the Ohio EPA to derive ecoregional biological expectations will be revisited for the purposes of trends assessment and to support future calibration needs.. Lastly, sentinel sites where the modeling unit will calibrate ten stage control and fourteen e-coli sites will be selected and measured on each chemistry sample pass. A list of field sampling stations can be found in Table 3.

## Sampling Objectives

- 1 Systematically sample and assess the principal drainage networks of Sandy Creek and its tributaries in support of the TMDL process,
- 2 Gather ambient environmental information (biological, chemical, and physical) from undesignated water bodies, to recommend an appropriate suite of Beneficial Uses (e.g., aquatic life, recreational, water supply),
- 3 Collect fish tissue samples at selected stations (Table 1).
- 4 Verify the appropriateness of existing, unverified, Beneficial Use Designations,
- 5 Establish baseline ambient biological conditions at selected reference stations to evaluate the effectiveness of future pollution abatement efforts, and
- 6 Document any changes in the biological, chemical, and physical conditions of the study areas where historical information exists, thus expanding the Ohio EPA data base for statewide trends analysis (e.g., 305[b])

## Total Maximum Daily Load (TMDL)

Information collected as part of this survey will support TMDL development for the study areas. The objectives of the TMDL process are to estimate pollutant loads from the various sources within the basin, define or characterize allowable loads to support the various beneficial uses, and to allocate pollutant loads among different pollutant sources through appropriate controls (e.g., NPDES permitting, storm water management, 319 proposals, NPS controls or other abatement strategies).

The components of the TMDL process supported by this survey are primarily the identification of impaired waters, verification (and redesignating if necessary) of beneficial use designations, and sources of use impairment. These data are necessary precursors to the development of effective control or abatement strategies.

## Aquatic Life Use Designations

Many of the streams contained within the study area are unassessed. Many of the Aquatic Life Use Designations for these waters were made prior to standardized approaches to the collection of instream biological data or numerical biological criteria. As a result, many of the existing Aquatic Life

Use Designations for streams within the study area are classified as unverified. Further more, many water bodies within the study area are unclassified with no **existing Beneficial Use Designations** assigned. The Ohio EPA is obligated to review, evaluate, or recommend (where appropriate) Beneficial Uses prior to basing any permitting actions on existing, unverified designations, or entirely unclassified water bodies. Much of the sampling effort for this survey is allocated to fulfill this obligation.

## Issues in the Watershed

With the exception of Still Fork, Middle Branch Sandy Creek and Hugle Run, this will be the first time that OEPA will be expanding sampling in to the tributaries and headwaters of Sandy Creek. Acid mine drainage is expected to be an issue in the tributaries. ODNr Division of Mineral Resource Management has identified several sites impacted by acid mine drainage. OEPA will conduct chemical and biological sampling at these sites to document acid mine impacts on the water quality. It is probable that a majority of the watershed septic systems have exceeded their useful life and have either failed or are failing. Inadequately treated sewage can impact the water quality of the streams and lake and can cause health hazards in drinking and recreational waters will be conducted where septic issues may be of concern.

The Village of Minerva operates a wastewater treatment plant which provides secondary treatment of municipal and pretreated industrial waste. The treated wastewater is discharged to Sandy Creek at RM 29.08. Major improvements to the WWTP were completed in September 1996. Elevated levels of ammonia-N have been a recurring problem in the past. Impacts related to the Minerva WWTP appeared primarily through excessive organic enrichment.

Three major industrial contributors to the Minerva WWTP include Mascotech, PCC Airfoils and Minerva Dairy. Historically PCC Airfoil experienced spikes in nickel discharged into the Minerva sanitary sewer system. Recent improvements in waste stream segregation and pretreatment facilities at PCC Airfoil have resulted in below detection readings for nickel in the discharge to the Minerva sanitary sewer. Mascotech currently discharges all of its wastewater (0.03) mgd) into the Minerva sanitary sewers. The Minerva Dairy is maintaining reasonable compliance with pretreatment permit limits.

## Study Planning Team:

|              |                   |
|--------------|-------------------|
| Leader:      | Bill Zawiski      |
| Coach:       | Dave Stroud       |
| Eas Fish:    | Brian Alsdorf     |
| Eas Macro:   | Dale Eicher *     |
| Modeling:    | Joseph Bishop     |
| NPDES:       | Joe Trocchio NEDO |
| NPDES:       | Dan Kopec CO      |
| NPS:         | Mark Bergman NEDO |
| Stormwater:  | Kelvin Rogers     |
| TMDL:        | Greg Sablak       |
| 401:         | Dan Osterfeld     |
| Ag./PTI      | Jon Bernstein     |
| Resource:    | Greg Orr          |
| * TSD Editor |                   |

Table 1. Proposed 2010 fish tissue sampling sites for Sandy Creek Watershed

| <b>Stream</b> | <b>River Mile</b> | <b>Location</b>     |
|---------------|-------------------|---------------------|
| Sandy Creek   | 33.0              | Ust TRW Company     |
| Sandy Creek   | 29.2              | Ust Minerva WWTP    |
| Sandy Creek   | 27.8              | At Summerville Tile |
| Sandy Creek   | 23.5              | At Nat'l Aggregate  |
| Sandy Creek   | 22.1              | At Malvern WWTP     |
| Sandy Creek   | 0.50              | Dst Bolivar Dam     |

Table 2. Individual and General permits regulated by the National Pollution Discharge Elimination System in the Sandy Creek Watershed.

**Individual Permits:**

| <b><u>OEPA Permit</u></b> | <b><u>Type</u></b> | <b><u>Facility Name</u></b>               | <b><u>Latitude</u></b> | <b><u>Longitude</u></b> |
|---------------------------|--------------------|-------------------------------------------|------------------------|-------------------------|
| 0IN00234                  | Industrial         | Mineral City Loading Facility             | 40.62242               | -81.36393               |
| 3ID00060                  | Industrial         | Minerva Groundwater Remediation Facility  | 40.74469               | -81.09029               |
| 3II00196                  | Industrial         | Aluminum One                              | 40.72192               | -81.11214               |
| 3II00201                  | Industrial         | Valley Mining Inc                         | 40.689444              | 81.420833               |
| 3IL00018                  | Industrial         | Buckeye Indus Mining Co                   | 40.73329               | -80.98569               |
| 3IN00169                  | Industrial         | American Landfill Inc                     | 40.71999               | -81.26387               |
| 3IN00203                  | Industrial         | Liberty Tire Services of Ohio LLC         | 40.73428               | -81.12431               |
| 3IS00115                  | Industrial         | Colfor Mfg Inc Malvern                    | 40.69029               | -81.16319               |
| 3IY00161                  | Industrial         | Skyland Hills MHP WTP                     | 40.73711               | -81.14464               |
| 0PJ00007                  | Municipal          | Sandyville-East Sparta WWTP               | 40.63295               | -81.36224               |
| 3PB00102                  | Municipal          | BTM Sewer District                        | 40.68723               | -81.19042               |
| 3PC00023                  | Municipal          | Minerva STP                               | 40.71777               | -81.1085                |
| 3PG00149                  | Municipal          | Skyland Hills MHP                         | 40.73714               | -81.14476               |
| 3PH00053                  | Municipal          | Magnolia Village WWTP                     | 40.65549               | -81.30905               |
| 3PR00169                  | Municipal          | Bear Creek Campground & Toboggan Club Inc | 40.68552               | -81.41698               |
| 3PR00171                  | Municipal          | Carroll Co Home Golden Age Retreat        | 40.613213              | 81.066786               |
| 3PR00177                  | Municipal          | Oakhill Manor Care Center                 | 40.83637               | -81.18053               |
| 3PR00470                  | Municipal          | Spread Eagle Tavern Inc                   | 40.753693              | 80.934944               |
| 3PT00066                  | Municipal          | United Local School District              | 40.78345               | -80.93092               |
| 3PT00075                  | Municipal          | West Elementary School                    | 40.74772               | -81.04152               |
| 3PV00080                  | Municipal          | Fohl Village MHP                          | 40.72207               | -81.4035                |
| 3PV00124                  | Municipal          | Town & Country Park Estates               | 40.74914               | -81.0706                |

Table 2 cont'd

**General Permits:**

| <u>OEPA Permit</u> | <u>Type</u>         | <u>Facility Name</u>                             | <u>Latitude</u> | <u>Longitude</u> |
|--------------------|---------------------|--------------------------------------------------|-----------------|------------------|
| 0GT00002           | Temporary Discharge | Bolivar Dam                                      | 40.651944       | 81.430833        |
| 3GB00001           | Petrol Bulk Storage | Campbell Oil Minerva Bulk *                      | 40.722279       | -81.10772        |
| 3GM00017           | Coal Surface Mine   | Valley Mining Inc - ENZ Inc *                    | 40.694722       | 81.301389        |
| 3GM00055           | Coal Surface Mine   | American Landfill Inc                            | 40.725833       | 81.260833        |
| 3GM00067           | Coal Surface Mine   | Buckeye Industrial Mining Co                     | 40.666111       | 81.329167        |
| 3GM00092           | Coal Surface Mine   | Buckeye Industrial Mining Co - Finnie            | 40.766944       | 1.119167         |
| 3GM00115           | Coal Surface Mine   | Buckeye Industrial Mining Co - Berlin Minerals   | 40.684167       | 81.321389        |
| 3GM00120           | Coal Surface Mine   | Buckeye Industrial Mining Co - Wilson            | 40.691944       | 81.277778        |
| 3GM00122           | Coal Surface Mine   | Buckeye Industrial Mining Co - Mapleton          | 40.751389       | 81.252778        |
| 3GM00123           | Coal Surface Mine   | Buckeye Industrial Mining Co - Beaver Excavating | 40.758889       | -81.11           |
| 3GM00124           | Coal Surface Mine   | Buckeye Industrial Mining Co - Freed Street      | 40.775833       | 81.141389        |
| 3GM00126           | Coal Surface Mine   | Buckeye Industrial Mining - Hamilton             | 40.768333       | 81.154167        |
| 3GT00003           | Temporary Discharge | Liberty Tire Services of Ohio LLC *              | 40.732222       | 81.123333        |

Table 3. Sampling locations with geographical coordinates, by stream, for the Sandy Creek Watershed survey, 2010.

| RIVER                                                    | RIVER MILE | DRAIN AREA | LOCATION                             | ISSUE                      | SAMPLE TYPE     | STORET |
|----------------------------------------------------------|------------|------------|--------------------------------------|----------------------------|-----------------|--------|
| HUC 0504000040 06 - Upper Sandy Creek                    |            |            |                                      |                            |                 |        |
| Sandy Creek                                              | 44.38      | 10.40      | US 30 Dst of Kensington              | Septic                     | M,C,S,V,F       |        |
| Sandy Creek                                              | 36.91      | 17.60      | @ Lippincott Rd.                     | Acid Mine                  | M,C,F           |        |
| Sandy Creek                                              | 34.70      | 36.30      | W. TWP Park E.Rochester              | Sentinel/ecoli             | MT,C,B,D,F2     | R07K12 |
| Sandy Creek                                              | 32.06      | 54.40      | Ust of Minerva                       | Spatial                    | M,C,F           |        |
| Sandy Creek                                              | 30.50      | 61.70      | 1 <sup>st</sup> ped bridge ust SR 30 | Sentinel/ecoli             | MT,C,B,D,F2,S,V | R07K11 |
| HUC 0504000060 05 - Armstrong Run - Sandy Creek          |            |            |                                      |                            |                 |        |
| Armstrong Run                                            | 0.63       | 10.30      | @ SR 43                              | Spatial                    | M,C,F           |        |
| Sandy Creek                                              | 29.50      | 62.90      | NYC RR Tresle                        | Ust of Minerva WWTP        | MT,C,F2         |        |
| Sandy Creek                                              | 28.30      | 135.00     | @ Pekin                              | Dst of Minerva WWTP        | MT,FT,C,F2,S,V  |        |
| Sandy Creek                                              | 27.60      | 135.00     | Dst of SR 183                        | Summerville Tile           | FT,C,S,V        | R07K06 |
| Sandy Creek                                              | 25.10      | 161.00     | Blade Rd. ust Oneida                 | Sentinel Site/ecoli        | MT,C,B,D,F2     |        |
| Sandy Creek                                              | 23.50      | 163.00     | @ SR 68                              | National Aggregates Quarry | FT,C            |        |
| Sandy Creek                                              | 22.05      | 191.00     | Citrus DR. dst of Pipe Run           | Dst of Malvern WWTP        | FT,C            |        |
| Sandy Creek                                              | 18.20      | 214.00     | @ Greer Rd.                          | ODNR AMD                   | M,C,F           |        |
| Sandy Creek                                              | 17.30      | 214.00     | @ SR 183                             | Sentinel Site/ecoli        | MT,C,B,D,F2     |        |
| Sandy Creek                                              | 13.90      | 278.00     | @ SR183 Magnolia                     | Septic                     | M,C,F           | R07P09 |
| Sandy Creek                                              | 7.49       | 481.00     | @ Sandyvill Rd. C 107                | Sentinel Site/ecoli        | MT,C,B,D,F2     | R07P25 |
| Sandy Creek                                              | 0.57       | 481.00     | Dst of Bolivar Dam                   | Spatial                    | MT,C,B,D,FT,F2  | R07S71 |
| HUC 0504000060 07 – Bear Run Limestone Creek – Sandy Run |            |            |                                      |                            |                 |        |
| Limestone Creek                                          | 3.68       | 1.57       | @ Downing St.                        | ODNR AMD/Habitat           | M,C,F,S,V       |        |
| Limestone Creek                                          | 0.10       | 5.25       | @ Deubler Ave.                       | Spatial                    | M,C,F           |        |
| Bear Run                                                 | 0.09       | 9.97       | @ Gracemont St.                      | Landfill                   | M,C,F,S,V       |        |
| HUC 0504000060 06 – Pleasant Valley, Indian Run          |            |            |                                      |                            |                 |        |
| Pleasant Valley                                          | 5.35       | 1.35       | @ SR 43 (Waynesburg Rd.)             | ODNR AMD                   | M,C,F           | 300626 |
| Pleasant Valley                                          | 0.89       | 10.10      | @ Grovedell St.                      | Spatial                    | M,C,F           |        |
| Indian Run                                               | 2.20       | 6.13       | @ SR 43/Ridgeview Dr.                | Near Goodland Acres        | M,C,F           |        |
| HUC 0504000060 04 – Little Sandy Creek                   |            |            |                                      |                            |                 |        |
| Little Sandy Creek                                       | 5.82       | 29.70      | @ Hill Church                        | Spatial                    | M,C,F           |        |

| RIVER                                       | RIVER MILE | DRAIN. AREA | LOCATION                  | ISSUE                | SAMPLE TYPE     | STORET |
|---------------------------------------------|------------|-------------|---------------------------|----------------------|-----------------|--------|
| Little Sandy Creek                          | 3.60       | 34.30       | @ Chapel                  | Spatial              | M,C,F           |        |
| Little Sandy Creek                          | 1.84       | 36.10       | @ Elson St.               | Sentinel/ecoli       | MT,C,F2,B,D,S,V |        |
| HUC 0504000060 03 – Black Run               |            |             |                           |                      |                 |        |
| Black Run                                   | 4.81       | 10.10       | @ Stucky/Robertsville RD. | Spatial              | M,C,F           |        |
| Black Run                                   | 0.10       | 16.40       | @ Orchard View Dr.        | Sentinel/ecoli       | MT,C,B,D,F2     | R07K16 |
| HUC 0504000060 02 – Pipe Run – Middle Run   |            |             |                           |                      |                 |        |
| Middle Run                                  | 0.10       | 6.61        | @ CR 68 (Crites Rd.)      | Dst from Lake Mohawk | M,C,F           |        |
| Pipe Run                                    | 6.28       | 9.61        | @ Arrow Rd.               | Spatial              | M,C,F           |        |
| Pipe Run                                    | 3.95       | 16.50       | @ Bellflower Rd. at RR    | Spatial              | M,C,F           |        |
| Pipe Run                                    | 0.22       | 25.60       | @ SR 43                   | Sentinel /ecoli      | MT,C,B,F2,D     | 300912 |
| HUC 0504000060 01 – Hugle Run               |            |             |                           |                      |                 |        |
| Hugle Run                                   | 7.35       | 5.86        | @ SR 172                  | Spatial              | M,C,F           |        |
| Hugle Run                                   | 4.11       | 12.20       | @ Baird Ave.              | Dst Edgewater GC     | M,C,F           | R07P14 |
| Hugle Run                                   | 1.33       | 20.10       | @ Liberty Church Rd.      | Sentinel/ecoli       | MT,C,B,F2,D     |        |
| HUC 0504000040 03 – Pipes Fork – Still Fork |            |             |                           |                      |                 |        |
| Pipes Fork                                  | 0.41       | 7.99        | @ Rush Rd.                | Spatial              | M,C,F           |        |
| Friday Creek                                | 0.55       | 8.94        | @ Channel Rd.             | Spatial              | M,C,F           |        |
| Still Fork                                  | 12.83      | 12.50       | @ Mark Rd.                | Dst of Bloom Coal    | M,C,F           |        |
| HUC 0504000040 05 – Reeds Run – Still Fork  |            |             |                           |                      |                 |        |
| Reeds Run                                   | 0.73       | 5.08        | @ SR 9                    | Spatial              | M,C,F           |        |
| Still Fork                                  | 7.08       | 47.00       | @ Bellflower Rd           | Sentinel/ecoli       | MT,C,B,F2,D     | R07W42 |
| Still Fork                                  | 0.51       | 71.00       | @ CR15 (Arrow Rd.)        | Dst of Masco Tech    | MT,C,F2         | R07S02 |
| Still Fork                                  | 0.01       | 71.40       | Dst of Dam                | Spatial              | B,C             | R07P26 |
| HUC 0504000040 04 –Muddy Fork               |            |             |                           |                      |                 |        |
| Muddy Fork                                  | 5.12       | 6.03        | @ Reef Rd.                | Spatial              | M,C,F           |        |
| Muddy Fork                                  | 3.95       | 8.65        | @ Augusta Rd              | Spatial              | M,C,F           |        |
| Muddy Fork                                  | 2.64       | 37.20       | @ Bellflower Rd.          | Sentinel/ecoli       | MT,C,B,F2,D     |        |
| HUC 0504000040 02–Middle Branch Sandy Creek |            |             |                           |                      |                 |        |
| Middle Branch Sandy Creek                   | 3.72       | 10.90       | @ SR 172                  | Spatial              | M,C,F           |        |
| Middle Branch Sandy Creek                   | 0.10       | 15.50       | @ Kurtz Rd.               | Sentinel/ecoli       | MT,C,B,F2,D     | 300913 |

| RIVER                               | RIVER MILE | DRAIN. AREA | LOCATION          | ISSUE   | SAMPLE TYPE | STORET |
|-------------------------------------|------------|-------------|-------------------|---------|-------------|--------|
| HUC 0504000040 01- Conservation Run |            |             |                   |         |             |        |
| Conservation Run                    | 4.71       | 5.75        | @ Speidel Rd.     | Spatial | M,C,F       |        |
| Conservation Run                    | 0.42       | 1.90        | @ Knox School Rd. | Spatial | M,C,F       |        |

\*Nimishillen Creek while not in this survey will be sampled at RM 2.75 for modeling puposes. Sampling will be done for chemistry and bacteria.

C – Chemistry site  
 B – Bacteria site  
 F – Fish Site  
 F2 – Fish Site (Two Passes)  
 FT – Fish Tissue  
 M – Macroinvertebrate site  
 MT – Macroinvertebrate quantitative site  
 S – Sediment site  
 D – Datasonde site  
 T – Fish Tissue  
 V – Volatile Organics

| Type                       | Number of Sites      |
|----------------------------|----------------------|
| Total                      | 50                   |
| Water chemistry            | 50                   |
| Bacteria                   | 14                   |
| Fish (2-pass/total passes) | 15/45                |
| Volatile Organics          | 7                    |
| Macroinvertebrate          | 45 (15 Quantitative) |
| Fish Tissue                | 6                    |
| Sediment                   | 7                    |
| Datasonde©                 | 13                   |

Table 4. Sampling locations with geographical coordinates, by stream, for the Sandy Creek watershed survey, 2010.

| RIVER              | RIVER MILE | DRAIN. AREA | LOCATION                             | LATITUDE | LONGITUDE | USGS QUAD    |
|--------------------|------------|-------------|--------------------------------------|----------|-----------|--------------|
| Sandy Creek        | 44.38      | 10.4        | US 30 Dst of Kensington              | 40.7338  | -80.9636  | Kensington   |
| Sandy Creek        | 36.91      | 17.60       | @ Lippincott Rd.                     | 40.7401  | -81.0071  | Minerva      |
| Sandy Creek        | 34.70      | 36.30       | W. TWP Park E.Rochester              | 40.7496  | -81.0448  | Minerva      |
| Sandy Creek        | 32.06      | 54.4        | Ust of Minerva                       | 40.7444  | -81.0816  | Minerva      |
| Sandy Creek        | 30.50      | 61.70       | 1 <sup>st</sup> ped bridge ust SR 30 | 40.7330  | -81.0991  | Minerva      |
| Armstrong Run      | 0.63       | 10.30       | @ SR 43                              | 40.6906  | -81.1928  | Malvern      |
| Sandy Creek        | 29.50      | 62.90       | NYC RR Tresle                        | 40.7301  | -81.0990  | Minerva      |
| Sandy Creek        | 28.30      | 135.00      | @ Pekin                              | 40.7126  | -81.1178  | Minerva      |
| Sandy Creek        | 27.60      | 135.00      | Dst of SR 183                        | 40.7149  | -81.1288  | Malvern      |
| Sandy Creek        | 25.10      | 161         | Blade Rd. ust Oneida                 | 40.6995  | -81.1505  | Malvern      |
| Sandy Creek        | 23.50      | 163         | @ SR 68/SR 43                        | 40.6915  | -81.1715  | Malvern      |
| Sandy Creek        | 22.05      | 191         | Citrus DR. dst of Pipe Run           | 40.6855  | -81.1920  | Malvern      |
| Sandy Creek        | 18.20      | 214.00      | @ Greer Rd.                          | 40.6717  | -81.2461  | Malvern      |
| Sandy Creek        | 17.30      | 214.00      | @ SR 183                             | 40.6717  | -81.2537  | Waynesburg   |
| Sandy Creek        | 13.90      | 278.00      | @ SR183 Magnolia                     | 40.6505  | -81.3026  | Waynesburg   |
| Sandy Creek        | 7.49       | 481.00      | @ Sandyville Rd. C 107               | 40.6339  | -81.3726  | Waynesburg   |
| Sandy Creek        | 0.57       | 481.00      | Dst of Bolivar Dam                   | 40.6512  | -81.4345  | Bolivar      |
| Limestone Creek    | 3.68       | 1.57        | @ Downing St.                        | 40.6776  | -81.3798  | Bolivar      |
| Limestone Creek    | 0.10       | 5.25        | @ Deubler Ave.                       | 40.6553  | -81.4057  | Bolivar      |
| Bear Run           | 0.09       | 9.97        | @ Gracemont St.                      | 40.6633  | -81.4106  | Bolivar      |
| Pleasant Valley    | 5.35       | 1.35        | @ SR 43 (Waynesburg Rd.)             | 40.7317  | -81.3136  | Waynesburg   |
| Pleasant Valley    | 0.89       | 10.10       | @ Grovedell St.                      | 40.6739  | -81.2948  | Waynesburg   |
| Indian Run         | 2.20       | 6.13        | @ SR 43/Ridgeview Dr.                | 40.6983  | -81.2707  | Waynesburg   |
| Little Sandy Creek | 5.82       | 29.70       | @ Hill Church                        | 40.7343  | -81.2442  | Malvern      |
| Little Sandy Creek | 3.60       | 34.30       | @ Chapel                             | 40.7092  | -81.2420  | Malvern      |
| Little Sandy Creek | 1.84       | 36.10       | @ Elson St.                          | 40.6896  | -81.2511  | Waynesburg   |
| Black Run          | 4.81       | 10.10       | @ Stucky/Robertsville RD.            | 40.7806  | -81.1776  | Robertsville |
| Black Run          | 0.10       | 16.40       | @ Orchard View Dr.                   | 40.7455  | -81.2405  | Malvern      |
| Middle Run         | 0.10       | 6.61        | @ CR 68 (Crites Rd.)                 | 40.6815  | -81.2054  | Malvern      |

| RIVER                     | RIVER MILE | DRAIN. AREA | LOCATION               | LATITUDE | LONGITUDE | USGS QUAD    |
|---------------------------|------------|-------------|------------------------|----------|-----------|--------------|
| Pipe Run                  | 6.28       | 9.61        | @ Arrow Rd.            | 40.6414  | -81.1136  | Minerva      |
| Pipe Run                  | 3.95       | 16.50       | @ Bellflower Rd. at RR | 40.6704  | -81.1352  | Malvern      |
| Pipe Run                  | 0.22       | 25.60       | @ SR 43                | 40.6841  | -81.1479  | Malvern      |
| Hugle Run                 | 7.35       | 5.86        | @ SR 172               | 40.7934  | -81.1261  | Robertsville |
| Hugle Run                 | 4.41       | 12.20       | @ Baird Ave.           | 40.7546  | -81.1446  | Robertsville |
| Hugle Run                 | 1.33       | 20.10       | @ Liberty Church Rd.   | 40.7285  | -81.1483  | Malvern      |
| Pipes Fork                | 0.41       | 7.99        | @ Rush Rd.             | 40.6464  | -81.0276  | Minerva      |
| Friday Creek              | 0.55       | 8.94        | @ Channel Rd.          | 40.6265  | -81.0034  | Minerva      |
| Still Fork                | 12.83      | 12.50       | @ Mark Rd.             | 40.6338  | -80.9859  | Minerva      |
| Reeds Run                 | 0.73       | 5.08        | @ SR 9                 | 40.6719  | -81.0320  | Minerva      |
| Still Fork                | 7.08       | 47.00       | @ Bellflower Rd        | 40.6799  | -81.0532  | Minerva      |
| Still Fork                | 0.51       | 71.00       | @ CR15 (Arrow Rd.)     | 40.7131  | -81.1016  | Minerva      |
| Still Fork                | 0.01       | 71.40       | Dst of Dam             | 40.4258  | -81.1069  | Minerva      |
| Muddy Fork                | 5.12       | 6.03        | @ Reef Rd.             | 40.7050  | -81.0030  | Minerva      |
| Muddy Fork                | 3.95       | 8.65        | @ Augusta Rd           | 40.6996  | -81.0220  | Minerva      |
| Muddy Fork                | 2.64       | 37.20       | @ Bellflower Rd.       | 40.7029  | -81.4334  | Minerva      |
| Middle Branch Sandy Creek | 3.72       | 10.90       | @ SR 172               | 40.7968  | -81.0700  | Homeworth    |
| Middle Branch Sandy Creek | 0.10       | 15.50       | @ Kurtz Rd.            | 40.7515  | -81.0696  | Homeworth    |
| Conservation Run          | 4.71       | 5.75        | @ Speidel Rd.          | 40.7775  | -80.9741  | Homeworth    |
| Conservation Run          | 0.42       | 1.90        | @ Knox School Rd.      | 40.7640  | -81.0339  | Hanoverton   |

## 2010 Sandy Creek Watershed Project

6/14/2010

*Table 5. List of chemical/physical water quality parameters to be analyzed/measured in surface water, sediment, and fish tissue from the Sandy Creek Watershed project. Water samples will be collected 5 times (organics twice), sediment once. Bacteria samples will be collected 5 - 10 times, with at least 5 samples in a thirty-day period to determine the recreational use. Select sampling locations will be monitored for dissolved oxygen, pH, temperature, and conductivity using Datasonde© continuous.*

| Parameters                                                            | Test Method                                  | Water           | Sediment          | Fish Tissue    |
|-----------------------------------------------------------------------|----------------------------------------------|-----------------|-------------------|----------------|
| Acidity                                                               | USEPA 305.1                                  | X               |                   |                |
| Alkalinity (carbonate/bicarbonate)                                    | USEPA 310.1                                  | X               |                   |                |
| BOD, 5-DAY                                                            | SM 5210B                                     | X               |                   |                |
| SOLIDS, DISSOLVED (TDS)                                               | USEPA 160.1                                  | X               |                   |                |
| SOLIDS, SUSPENDED (TSS)                                               | USEPA 160.2                                  | X               |                   |                |
| AMMONIA                                                               | USEPA 350.1/ <a href="#">SM 4500</a>         | X               | <a href="#">X</a> |                |
| TKN                                                                   | USEPA 351.2                                  | X               |                   |                |
| NITRATE-NITRITE                                                       | USEPA 353.1                                  | X               |                   |                |
| Nitrite                                                               | USEPA 354.1                                  | X               |                   |                |
| Chloride                                                              | USEPA 325.1                                  | X               |                   |                |
| COD                                                                   | USEPA 410.4                                  | X               |                   |                |
| Sulfate                                                               | USEPA 375.4                                  | X               |                   |                |
| TOTAL PHOSPHORUS                                                      | USEPA 365.4/ <a href="#">USEPA 365.4</a>     | X               | <a href="#">X</a> |                |
| DISSOLVED PHOSPHORUS                                                  | USEPA 365.4                                  | X               |                   |                |
| <b>ICP 1</b> (Al,Ba,Ca,Cr,Cu,Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Hardness) | USEPA 200.7                                  | X               |                   |                |
| <b>ICP 3</b> (Al,Ba,Ca,Cr,Cu,Fe,Mg,Mn,Na,Ni,K,Sr,Zn,Pb)               | <a href="#">USEPA 200.7</a>                  |                 | <a href="#">X</a> |                |
| <b>SIMA 1</b> (As,Cd,Pb,Se)                                           | USEPA 200.9, SM 3113B                        | X               |                   | X              |
| <b>SIMA 2</b> (As, Cd, Se)                                            | <a href="#">USEPA 200.9, SM 3113B</a>        |                 | <a href="#">X</a> |                |
| MERCURY, TOTAL                                                        | USEPA 245.1,7470A, <a href="#">7471A</a>     | X               | <a href="#">X</a> | X (245.1)      |
| pH - grab                                                             | Hanna HI9811 meter                           | X - field       |                   |                |
| Conductivity - grab                                                   | Hanna HI9811 meter/ USEPA 120.1              | X - field / lab |                   |                |
| Dissolved Oxygen - grab                                               | YSI 55 meter                                 | X - field       |                   |                |
| Temperature - grab                                                    | YSI 55 meter                                 | X - field       |                   |                |
| VOCs                                                                  | -                                            | NOT RECOMMENDED | <a href="#">X</a> |                |
| SVOCs                                                                 | USEPA 625/ <a href="#">USEPA 8270C</a>       | X               | <a href="#">X</a> |                |
| Pesticides/PCBs/ Chlordane                                            | USEPA 608/ <a href="#">USEPA 8081A, 8082</a> | X               | <a href="#">X</a> | X (OEPA 590.1) |
| E.coli                                                                | USEPA 1103.1/ 640.1                          | X               |                   |                |
| Chlorophyll a                                                         | USEPA 445.1                                  | X               |                   |                |
| Percent Solids                                                        | <a href="#">SM 2540G</a>                     |                 | <a href="#">X</a> | X              |

**ODNR DOW County Wildlife Officers**

**Carroll County: Don Shroyer 330 644-3802 Ext.3205**  
**Columbiana County: Scott Angelo 330 644-3802 Ext.3212**  
**Stark County: Timothy Jordon 330 644-3802 Ext.3203**  
**Tuscarawas County: John Suchora 330 644-3802 Ext. 3204**

**Local and Regional Hospitals in the Area**

**Mercy Medical Center**  
**1320 Mercy Dr. NW Canton, OH. 330 489-1000**

**Aultman Hospital**  
**2600 6<sup>th</sup> Street Canton, OH. 330 823-6521**

**Salem Community Hospital**  
**1995 E. State St. Salem, OH. 330 332-7166**

**Affinity Medical Center**  
**400 Austin Ave. NW Massillon, OH. 330 837-7200**

**County Sheriffs Contacts**

|                          |                     |
|--------------------------|---------------------|
| <b>Carroll County</b>    | <b>330 627-2141</b> |
| <b>Columbiana County</b> | <b>330 424-1104</b> |
| <b>Stark County</b>      | <b>330 430-3801</b> |
| <b>Tuscarawas County</b> | <b>330 339-2000</b> |

## References

- Hughes, R. M., D. P. Larsen, and J. M. Omernik. 1986. Regional reference sites: a method for assessing stream pollution. *Env. Mgmt.* 10(5): 629-635.
- Karr, J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Env. Mgmt.* 5(1): 55-68.
- Ohio EPA. 1987a. Biological criteria for the protection of aquatic life: Volume I. The role of biological data in water quality assessment. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio.  
<http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html>
- Ohio EPA. 1987b. Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio  
<http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html>
- Ohio EPA. 1989a. Addendum to biological criteria for the protection of aquatic life: Users manual for biological field assessment of Ohio surface waters. Division of Water Quality Planning and Assessment, Surface Water Section, Columbus, Ohio.  
<http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html>
- Ohio EPA. 1989b. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Division of Water Quality Planning and Assessment, Columbus, Ohio.  
<http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html>
- Ohio EPA. 1997. Draft. Biological Criteria for the Protection of Aquatic Life: Volume IV: Fish and Macroinvertebrate Indices for Ohio's Lake Erie Nearshore Waters, Harbors, and Lacustuaries. Division of Surface Water, Ecological Assessment Unit, Ohio EPA, Columbus, Ohio, USA.
- Ohio EPA. 2001. Sediment sampling guide and methodologies, 2<sup>nd</sup> edition. Nov. 2001. Division of Surface Water, Columbus, Ohio.  
<http://www.epa.state.oh.us/dsw/guidance/sedman2001.pdf>
- Ohio EPA. 2004. State of Ohio Cooperative Fish Tissue Monitoring Program, Fish Collection Guidance Manual Final.March 2004  
<http://www.epa.state.oh.us/dsw/fishadvisory/FishCollectionGuidanceManual05.pdf>
- Ohio Environmental Protection Agency. 2006. Ohio EPA manual of surveillance methods and quaity assurance practices, updated edition. Division of Environmental Services, Columbus, Ohio.  
<http://www.epa.state.oh.us/dsw/documents/Field%20Manual%203-6-06%20revision.pdf>
- Omernik, J.M. 1987. Ecoregions of the conterminous United States. *Ann. Assoc. Amer. Geogr.* 77(1): 118-125.
- Rankin, E.T. 1989. The qualitative habitat evaluation index (QHEI): rationale, methods, and application. Division of Water Quality Planning and Assessment, Columbus, Ohio.  
<http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html>