

Ohio EPA Credible Data Program –
Level II Project Study Plan

Butler County Streams –
Water Quality Stream Sampling Program



March through November 2016

1-4 Personnel and Objectives

In response to the National Pollution Discharge Elimination System (NPDES) Phase II Storm Water Permit, the Butler County Storm Water District, Butler Soil and Water Conservation District and Miami University formed a collaborative partnership creating the Butler County Stream Team. The objective of the project is to provide the most accurate and reliable chemical water quality level 2 baseline data on Butler County streams as possible while simultaneously engaging the community and educating the public about streams, human impacts on streams and storm water flow. Chemical water quality grab samples will be taken from strategically determined sample sites, brought to the laboratory and analyzed for pollutants typical of agricultural and urban storm water run-off.

Members from each of the collaborating partner organizations (with at least one member as a Qualified Data Collector – Level II certified status) have met to determine the strategically placed sample sites throughout Butler County. Refer to Table 1 for additional personnel information. In an effort to have at least one sample site in a majority of Butler County watersheds, 77 sites were agreed upon. Refer to Figure 1 for a comprehensive view of the sample sites within Butler County (the study area).

Table 1

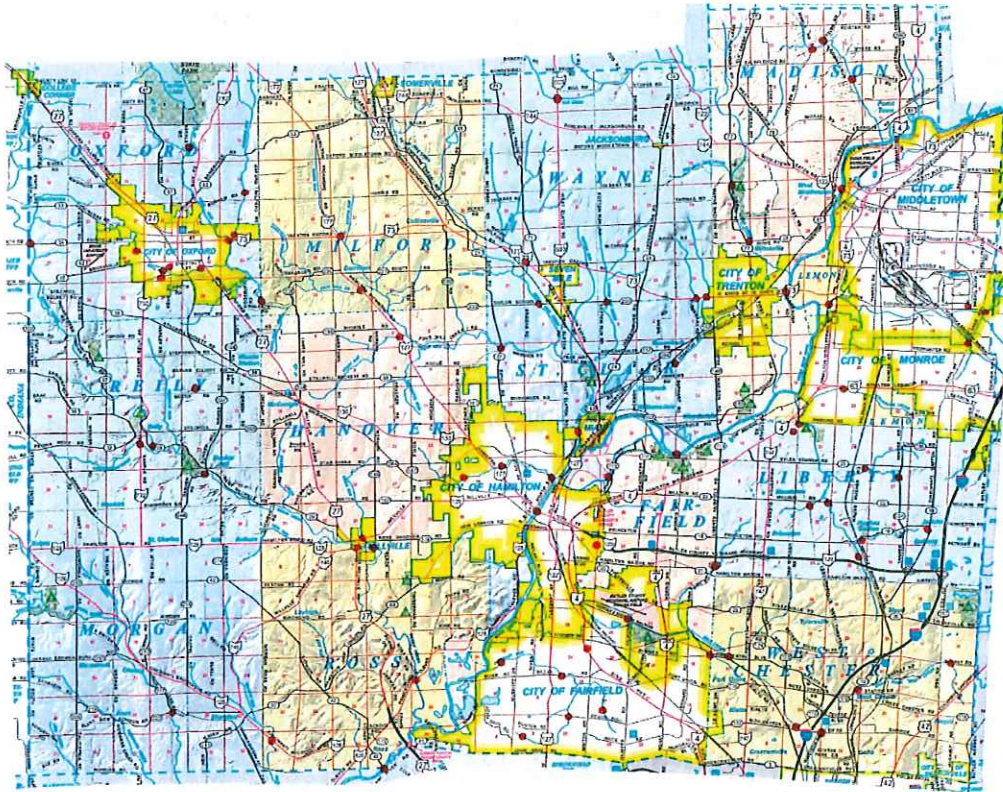
<p>*Teresa Barnes - QDC # 00982 Butler County Storm Water District 1921 Fairgrove Avenue Hamilton, OH 45011 barnest@bceo.org 513-785-4142</p>	<p>Lynn White - QDC # 00422 Butler Soil and Water Conservation District 1802 Princeton Road Hamilton, OH 45011 WhiteLR@butlercountyohio.org 513-785-6666</p>
<p>Robert Lentz - QDC # 00423 Butler County Storm Water District 1921 Fairgrove Avenue Hamilton, OH 45011 lentzb#@stormwaterdistrict.org 513-785-4101</p>	<p>Tera Ratliff - QDC # 00989 Miami University 212 Pearson hall, 700 East High Street Oxford, OH 45056 ratliffj@miamioh.org 513-529-3375</p>

*indicates project point of contact

Additional people working on the project are Kelly Crout (BSWCD), Elizabeth Downs (BSWCD) and Daniel Hoit (BCSWD).

Figure 1 - Sample locations relative to watersheds in Butler County.

Map provided by Butler County Storm Water District.



To accomplish the collection of the grab samples and the laboratory sample analysis, a dedicated group of volunteers participate in the project. These volunteers commit to working with the project every second Saturday of each month, February through November. February is dedicated to education and training. Samples are then collected for analysis March through November.

In order to be selected as a project participant, volunteers will attend the provided training held February 13, 2016. (Additional training sessions will be held for those who cannot attend this meeting) During this training session, the volunteers will be instructed (both with verbal descriptions and physical demonstrations) how to properly collect a Chemical Water Quality grab sample. This includes information such as :

- The sample bottles will be triple rinsed with water from the sampling site before a representative sample is taken.
- The samples will be collected between 7:30 and 10:00 am on the second Saturday of each month.

- Volunteers are required to sign the samples into one the six provided iced cooler by 10:30 am.

Volunteers will be required to demonstrate their understanding of the procedures. Volunteers are provided with clean sample bottles, labels for the specific sample site, a safety vest and a device to collect the sample from the bridge. (Due to site restrictions, there are a few sites that are not collected from a bridge.) Volunteers will also assist with the laboratory analysis of the samples. There will be 3-9 volunteers within the lab during each sampling date. These volunteers will be observed and monitored by no less than two (2) of the above listed QDC members.

5 Detailed Description of the Study Area:

As shown within Figure 1, Butler County equates to the study area. Approximately 85% of Butler County lies within the Great Miami River Watershed. The remaining portions of Butler County include the Little Miami Watershed, the Whitewater Watershed and the Middle Ohio-Laughery Watershed.



Figure 2 - Location of Butler County in Ohio (right) and its four HUC 8 watersheds:

05080002 = Lower Great Miami

05090202 = Little Miami

05080003 = Whitewater

05090203 = Middle Ohio Laughery

(Adapted from USEPA *Surf Your Watershed*, available at

http://cfpub.epa.gov/surf/county.cfm?fips_code=39017)

The stream resources of Butler County include about 304 linear miles of major streams. Each watershed within Butler County was analyzed on an individual basis. A sample location was selected as close as possible to the mouth of the watershed. Additional sample locations were chosen based on the amount of drainage area and size of the tributaries. If possible, a sample location was selected as close as possible to the headwater of the watershed. The chosen sample locations are either from a public bridge or the landowner has signed a permission waiver. Each sample location is assigned a volunteer. Refer to Figure 1 for a county wide representation of the chosen sample locations. Individual site specific information such as:

- sample site ID
- location
- description
- watershed
- river/stream name
- river/stream mile
- latitude and longitude
- Township, Section Town and Range
- Hydrologic Unit Code 8
- Hydrologic Unit Code 12
- Land use within area
- Purpose for data collection
- Photos of each site, upstream and downstream

can be obtained from the database as found on the website at www.streambank.info.

Butler County has an area of 467.3 square miles (301,289 acres), with land use that is dominated by agriculture (Table 2). Row crops and pasture cover almost two-thirds (63%) of the land area, with secondary forests and urban land use covering the remaining acreage.

Table 2 Land Use in Butler County (adapted from Ohio Department of Development *Ohio County Profiles*, available at <http://development.ohio.gov/research/files/s0/Butler.pdf>)

Land Use/Land Cover	Percent of Land Area	Square Miles	Acres
Cropland	51.45	240.42	153,872.50
Forest	23.24	108.6	69,504.33
Urban	12.77	59.67	38,191.49
Pasture	11.3	52.8	33,795.13
Open Water	0.88	4.11	2,631.83
Bare/Mines	0.36	1.68	1076.66
Total	100	467.3	299,072

Several non-point pollutants result from agricultural activities. These activities include, but are not limited to sediment, nutrients, pathogens, pesticides, and animals. Activities can also result in damage to the habitat and stream channels.

Urban areas are characterized by a significant increase in impervious areas, resulting in increases in the volume and velocity of storm water runoff. These increases in runoff carry an increase in pollutants, such as but not limited to, sediment, oil, grease, pesticides and nutrients from lawns and gardens, bacteria and nutrients from pet waste and failing septic systems, road salts, and heavy metals.

Point source pollution comes from areas such as but not limited to sanitary sewer treatment plants, industrialized areas, golf courses, etc.

6-8 Parameters Covered, Field Collection, and Data Assessment Techniques

In response to the potential pollutants within the streams, sample sites were selected to best cover the various watersheds and land use areas within Butler County. Chemical water quality grab samples will be collected at each of the sampling sites and will be analyzed for six (6) parameters;

- turbidity,
- conductivity,
- total dissolved solids (TDS),
- total phosphorus
- nitrate
- and bacteria (E. coli and total coliforms).

Water samples are collected in 250 mL nalgene bottles. The bottles are acid washed between sampling events.

Samples from bridges are collected using a bridge sampling device, constructed of a bottle-holding unit (a modified suet basket), a 30-foot length of rope, a weight to allow the sample bottle to sink even in fast-moving water, and a small bungee cord to hold the bottle in place (Figure 3).



Figure 3. Bridge sampling device provided for Butler County Stream Team volunteers.

All chemical water quality grab samples will be brought to the laboratory at Miami University for analysis of the six (6) parameters. Refer to Table 3 for a list of equipments used as recommended by the US EPA for Level 2 data credibility.

Table 3

Parameter Tested	Laboratory Analysis Method	Detection Limit
Bacteria	IDEXX Colilert QuantiTray 2000	1-2419/100mL
Conductivity	Hach SensION5 Direct Measure Method EPA 2510-B	0.1µS – 199mS
Nitrate	Hach TNT plus, LR 835	0.23 - 13.5mg/L
Total Phosphorus	Hach TNT plus, LR 843	0.15 – 4.5mg/L
Total Dissolved Solids (TDS)	Hach SensION5 Empirically derived using Conductivity value	~ 0.1 – 50g/L
Turbidity	LaMotte 2020e EPA Method 180.1	0 – 2000 NTU

10 Schedule of Planned Sampling Activities

As previously mentioned, sampling of the streams will occur on the second Saturday of the month, March 2016 through November 2106. Every effort will be made to ensure that all sample sites will be visited on each sampling day. Should the stream be dry, that will be noted within the data. Data would be uploaded to the state system shortly after the final sampling day in November.

11 Laboratory

As previously mentioned, all samples will be brought to a laboratory at Miami University, 501 East High Street Oxford, OH 45056. Tera Ratliff serves as the contact for the laboratory.

Tera Ratliff - QDC # 00989

Miami University

105 Pearson Hall

700 E High Street

Oxford, OH 45056

ratliffjt@miamioh.org

513-529-0180


12 Scientific Collector's Permit

N/A


13-14 Site Information and Digital Photo Statement

The Butler County Stream Team will maintain and make available to the director, for each sampling site a compilation of required information and associated digital pictures. This information will be maintained within a database, which can be access online at butlercountystreamteam.org. The required information includes:


- sample site ID
- location
- description
- watershed
- river/stream name
- river/stream mile
- latitude and longitude
- Township, Section Town and Range
- Hydrologic Unit Code 8
- Hydrologic Unit Code 12
- Land use within area
- Purpose for data collection
- Photos of the specific sampling location, adjacent riparian zones for both upstream and downstream.

Signature:  _____ Date: 3-1-16

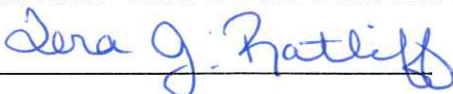
Teresa Barnes – Butler County Storm Water District

Signature:  _____ Date: 2-29-16

Robert Lentz – Butler County Storm Water District

Signature:  _____ Date: 3-1-16

Lynn White – Butler Soil and Water Conservation District

Signature:  _____ Date: 1-March-2016

Tera Ratliff – Miami University

15 Voucher Specimens for Macroinvertebrates

N/A

16 Additional QDC verification

N/A

17 Scientific Collector's Permit

I, Teresa K. Barnes have not been convicted of or pleaded guilty to a violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: 

Date: 3-1-16

I, Robert Lentz have not been convicted of or pleaded guilty to a violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: 

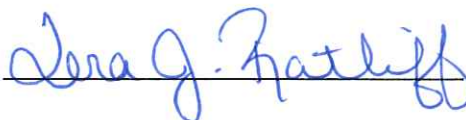
Date: 2/29/16

I, Lynn White have not been convicted of or pleaded guilty to a violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: 

Date: 3-1-16

I, Tera Ratliff have not been convicted of or pleaded guilty to a violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: 

Date: 1-March-2016

