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Environmental  
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Division of Surface Water

## Appendices to:

# Biological and Water Quality Study of the Sandusky Bay Tributaries, 2009

Watershed Assessment Units 04100011 01, 02, 12, 13, 14

Erie, Sandusky, and Seneca Counties



OHIO EPA Technical Report EAS/2010-4-6

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## **Appendix A - Biosurvey Background Information**

**NOTICE TO USERS**

Ohio EPA incorporated biological criteria into the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) regulations in February 1990 (effective May 1990). These criteria consist of numeric values for the Index of Biotic Integrity (IBI) and Modified Index of Well-Being (MIwb), both of which are based on fish assemblage data, and the Invertebrate Community Index (ICI), which is based on macroinvertebrate assemblage data. Criteria for each index are specified for each of Ohio's five ecoregions (as described by Omernik 1988), and are further organized by organism group, index, site type, and aquatic life use designation. These criteria, along with the existing chemical and whole effluent toxicity evaluation methods and criteria, figure prominently in the monitoring and assessment of Ohio's surface water resources.

The following documents support the use of biological criteria by outlining the rationale for using biological information, the methods by which the biocriteria were derived and calculated, the field methods by which sampling must be conducted, and the process for evaluating results:

Ohio Environmental Protection Agency. 1987a. Biological criteria for the protection of aquatic life: Volume I. The role of biological data in water quality assessment. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

\_\_\_\_ 1987b. Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Monit. & Assess., Surface Water Section, Columbus, Ohio.

\_\_\_\_ 1989b. Addendum to Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Div. Water Qual. Plan. & Assess., Ecological Assessment Section, Columbus, Ohio.

\_\_\_\_ 1989c. Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. Water Quality Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

\_\_\_\_ 1990. The use of biological criteria in the Ohio EPA surface water monitoring and assessment program. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

\_\_\_\_ 2008a. 2008 Updates to Biological criteria for the protection of aquatic life: Volume II and Volume II Addendum. Users manual for biological field assessment of Ohio surface waters. Div. of Surface Water, Ecol. Assess. Sect., Groveport, Ohio.

\_\_\_\_\_. 2008b. 2008 Updates to Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. of Surface Water, Ecol. Assess. Sect., Groveport, Ohio.

\_\_\_\_\_. 2006a. Methods for assessing habitat in flowing waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Tech. Bull. EAS/2006-06-1. Revised by the Midwest Biodiversity Institute for Div. of Surface Water, Ecol. Assess. Sect., Groveport, Ohio.

\_\_\_\_\_. 2006b. 2006 updates to Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Div. of Surface Water, Ecol. Assess. Sect., Columbus, Ohio.

Rankin, E.T. 1989. The qualitative habitat evaluation index (QHEI): rationale, methods, and application. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.

Since the publication of the preceding guidance documents, the following new publications by the Ohio EPA have become available. These publications should also be consulted as they represent the latest information and analyses used by the Ohio EPA to implement the biological criteria.

DeShon, J.D. 1995. Development and application of the invertebrate community index (ICI), pp. 217-243. in W.S. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Risk-based Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Rankin, E. T. 1995. The use of habitat assessments in water resource management programs, pp. 181-208. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995a. Biological criteria program development and implementation in Ohio, pp. 109-144. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995b. Biological response signatures and the area of degradation value: new tools for interpreting multimetric data, pp. 263-286. in W. Davis and T. Simon (eds.). Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. 1995c. Policy issues and management applications for biological criteria, pp. 327-344. in W. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Water Resource Planning and Decision Making*. Lewis Publishers, Boca Raton, FL.

Yoder, C.O. and E.T. Rankin. 1995d. The role of biological criteria in water quality monitoring, assessment, and regulation. *Environmental Regulation in Ohio: How to Cope With the Regulatory Jungle*. Inst. of Business Law, Santa Monica, CA. 54 pp.

Yoder, C.O. and M.A. Smith. 1999. Using fish assemblages in a State biological assessment and criteria program: essential concepts and considerations, pp. 17-63. in T. Simon (ed.). *Assessing the Sustainability and Biological Integrity of Water Resources Using Fish Communities*. CRC Press, Boca Raton, FL.

These documents and this report may be obtained by writing to:

Ohio EPA, Division of Surface Water  
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## FOREWORD

### *What is a Biological and Water Quality Survey?*

A biological and water quality survey, or “biosurvey”, is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This effort may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. Each year the Ohio EPA conducts biosurveys in 4-5 watersheds study areas with an aggregate total of 250-300 sampling sites.

The Ohio EPA employs biological, chemical, and physical monitoring and assessment techniques in biosurveys in order to meet three major objectives: 1) determine the extent to which use designations assigned in the Ohio Water Quality Standards (WQS) are either attained or not attained; 2) determine if use designations assigned to a given water body are appropriate and attainable; and 3) determine if any changes in key ambient biological, chemical, or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices. The data gathered by a biosurvey is processed, evaluated, and synthesized in a biological and water quality report. Each biological and water quality study contains a summary of major findings and recommendations for revisions to WQS, future monitoring needs, or other actions which may be needed to resolve existing impairment of designated uses. While the principal focus of a biosurvey is on the status of aquatic life uses, the status of other uses such as recreation and water supply, as well as human health concerns are also addressed.

The findings and conclusions of a biological and water quality study may factor into regulatory actions taken by the Ohio EPA (e.g., NPDES permits, Director's Orders, the Ohio Water Quality Standards [OAC 3745-1], Water Quality Permit Support Documents [WQPSDs]), and are eventually incorporated into State Water Quality Management Plans, the Ohio Nonpoint Source Assessment, and the biennial Integrated Water Quality Monitoring and Assessment Report (305[b] and 303[d]).

### *Hierarchy of Indicators*

A carefully conceived ambient monitoring approach, using cost-effective indicators consisting of ecological, chemical, and toxicological measures, can ensure that all relevant pollution sources are judged objectively on the basis of environmental results. Ohio EPA relies on a tiered approach in attempting to link the results of administrative activities with true environmental measures. This integrated approach includes a hierarchical continuum from administrative to true environmental indicators (Figure 1). The six “levels” of indicators include: 1) actions taken by regulatory agencies (permitting, enforcement, grants); 2)



responses by the regulated community (treatment works, pollution prevention); 3) changes in discharged quantities (pollutant loadings); 4) changes in ambient conditions (water quality, habitat); 5) changes in uptake and/or assimilation (tissue contamination, biomarkers, wasteload allocation); and, 6) changes in health, ecology, or other effects (ecological condition, pathogens). In this process the results of administrative activities (levels 1 and 2) can be linked to efforts to improve water quality (levels 3, 4, and 5) which should translate into the environmental “results” (level 6). Thus, the aggregate effect of billions of dollars spent on water pollution control since the early 1970s can now be determined with quantifiable measures of environmental condition.

Superimposed on this hierarchy is the concept of stressor, exposure, and response indicators. *Stressor* indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. *Exposure* indicators are those which measure the effects of stressors and can include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to a stressor or bioaccumulative agent. *Response* indicators are generally composite measures of the cumulative effects of stress and exposure and include the more direct measures of community and population response that are represented here by the biological indices which comprise Ohio’s biological criteria. Other response indicators could include target assemblages, *i.e.*, rare, threatened, endangered, special status, and declining species or bacterial levels which serve as surrogates for the recreational uses. These indicators represent the essential technical elements for watershed-based management approaches. The key, however, is to use the different indicators *within* the roles which are most appropriate for each.

Describing the causes and sources associated with observed impairments revealed by the biological criteria and linking this with pollution sources involves an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators. The principal reporting venue for this process on a watershed or subbasin scale is a biological and water quality report. These reports then provide the foundation for aggregated assessments such as the Integrated Report, the Ohio Nonpoint Source Assessment, and other technical bulletins.

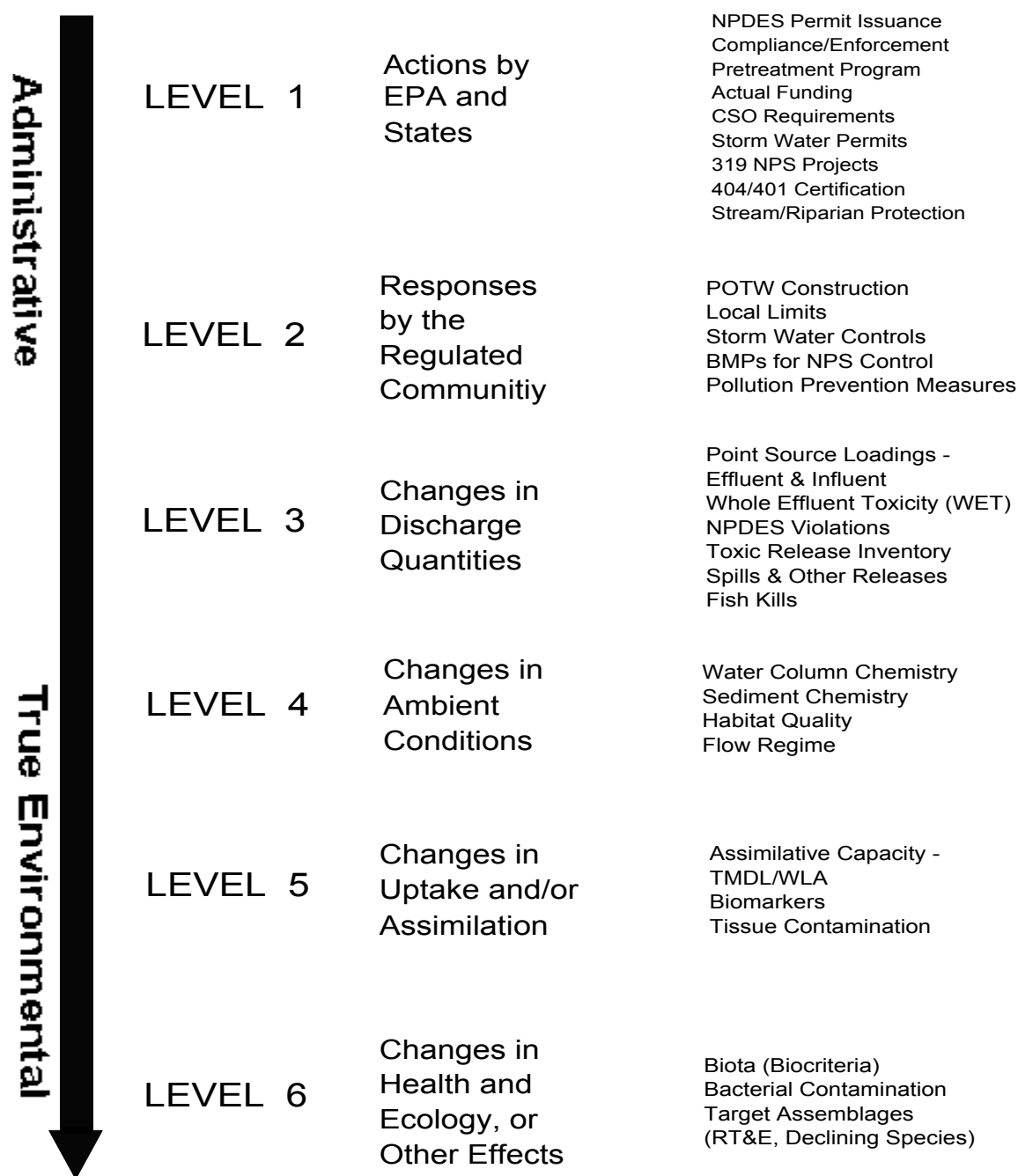


Figure 1. Hierarchy of administrative and environmental indicators which can be used for water quality management activities such as monitoring and assessment, reporting, and the evaluation of overall program effectiveness. This is patterned after a model developed by the U.S. EPA.

*Ohio Water Quality Standards: Designated Aquatic Life Use*

The Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1) consist of designated uses and chemical, physical, and biological criteria designed to represent measurable properties of the environment that are consistent with the goals specified by each use designation. Use designations consist of two broad groups, aquatic life and non-aquatic life uses. In applications of the Ohio WQS to the management of water resource issues in Ohio's rivers and streams, the aquatic life use criteria frequently result in the most stringent protection and restoration requirements, hence their emphasis in biological and water quality reports. Also, an emphasis on protecting for aquatic life generally results in water quality suitable for all uses. The five different aquatic life uses currently defined in the Ohio WQS are described as follows:

- 1) *Warmwater Habitat (WWH)* - this use designation defines the "typical" warmwater assemblage of aquatic organisms for Ohio rivers and streams; *this use represents the principal restoration target for the majority of water resource management efforts in Ohio.*
- 2) *Exceptional Warmwater Habitat (EWH)* - this use designation is reserved for waters which support "unusual and exceptional" assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (*i.e.*, declining species); *this designation represents a protection goal for water resource management efforts dealing with Ohio's best water resources.*
- 3) *Coldwater Habitat (CWH)* - this use is intended for waters which support assemblages of coldwater organisms and/or those which are stocked with salmonids with the intent of providing a put-and-take fishery on a year round basis which is further sanctioned by the Ohio DNR, Division of Wildlife; this use should not be confused with the Seasonal Salmonid Habitat (SSH) use which applies to the Lake Erie tributaries which support periodic "runs" of salmonids during the spring, summer, and/or fall.
- 4) *Modified Warmwater Habitat (MWH)* - this use applies to streams and rivers which have been subjected to extensive, maintained, and essentially permanent hydromodifications such that the biocriteria for the WWH use are not attainable *and where the activities have been sanctioned by state or federal law*; the representative aquatic assemblages are generally composed of species which are tolerant to low dissolved oxygen, silt, nutrient enrichment, and poor quality habitat.
- 5) *Limited Resource Water (LRW)* - this use applies to small streams (usually <3 mi<sup>2</sup> drainage area) and other water courses which have been irretrievably altered to the extent that no appreciable assemblage of aquatic life can be supported; such waterways generally include small streams in extensively urbanized areas, those which lie in watersheds with extensive drainage

modifications, those which completely lack water on a recurring annual basis (*i.e.*, true ephemeral streams), or other irretrievably altered waterways.

Chemical, physical, and/or biological criteria are generally assigned to each use designation in accordance with the broad goals defined by each. As such the system of use designations employed in the Ohio WQS constitutes a “tiered” approach in that varying and graduated levels of protection are provided by each. This hierarchy is especially apparent for parameters such as dissolved oxygen, ammonia-nitrogen, temperature, and the biological criteria. For other parameters such as heavy metals, the technology to construct an equally graduated set of criteria has been lacking, thus the same WQS criteria may apply to two or three different use designations.

#### *Ohio Water Quality Standards: Non-Aquatic Life Uses*

In addition to assessing the appropriateness and status of aquatic life uses, each biological and water quality survey also addresses non-aquatic life uses such as recreation, water supply, and human health concerns as appropriate. The recreation uses most applicable to rivers and streams are the Primary Contact Recreation (PCR) and Secondary Contact Recreation (SCR) uses. The criterion for designating the PCR use can be having a water depth of at least one meter over an area of at least 100 square feet or, lacking this, where frequent human contact is a reasonable expectation. If a water body does not meet either criterion, the SCR use applies. The attainment status of PCR and SCR is determined using bacterial indicators (*e.g.*, fecal coliform, *E. coli*) and the criteria for each are specified in the Ohio WQS.

Attainment of recreation uses are evaluated based on monitored bacteria levels. The Ohio Water Quality Standards state that all waters should be free from any public health nuisance associated with raw or poorly treated sewage (Administrative Code 3745-1-04, Part F). Additional criteria (Administrative Code 3745-1-07) apply to waters that are designated as suitable for full body contact such as swimming (PCR) or for partial body contact such as wading (SCR). These standards were developed to protect human health, because even though fecal coliform bacteria are relatively harmless in most cases, their presence indicates that the water has been contaminated with fecal matter.

Water supply uses include Public Water Supply (PWS), Agricultural Water Supply (AWS), and Industrial Water Supply (IWS). Public Water Supplies are simply defined as segments within 500 yards of a potable water supply or food processing industry intake. The Agricultural Water Supply (AWS) and Industrial Water Supply (IWS) use designations generally apply to all waters unless it can be clearly shown that they are not applicable. An example of this would be an urban area where livestock watering or pasturing does not take place, thus the AWS use would not apply. Chemical criteria are specified in the Ohio WQS for each use and attainment status is based primarily on chemical-specific indicators. Human health concerns are additionally addressed with fish tissue

data, but any consumption advisories are issued by the Ohio Department of Health.

## **MECHANISMS FOR WATER QUALITY IMPAIRMENT**

The following paragraphs are provided to present the varied causes of impairment that affect the resource quality of lotic systems in Ohio. While the various perturbations are presented under separate headings, it is important to remember that they are often interrelated and cumulative in terms of the detrimental impact that can result.

### *Habitat and Flow Alterations*

Habitat alteration, such as channelization, negatively impacts biological communities directly by limiting the complexity of living spaces available to aquatic organisms. Consequently, fish and macroinvertebrate communities are not as diverse. Indirect impacts include the removal of riparian trees and field tiling to facilitate drainage. Following a rain event, most of the water is quickly removed from tiled fields rather than filtering through the soil, recharging ground water, and reaching the stream at a lower volume and more sustained rate. As a result, small streams more frequently go dry or become intermittent. Urbanization impacts include removal of riparian trees, influx of stormwater runoff, straightening and piping of stream channels, and riparian vegetation removal.

Tree shade is important because it limits the energy input from the sun, moderates water temperature, and limits evaporation. Removal of the tree canopy further degrades conditions because it eliminates an important source of coarse organic matter essential for a balanced ecosystem. Riparian vegetation aids in nutrient uptake, may decrease runoff rate into streams, and helps keep soil in place. Erosion impacts channelized streams more severely due to the lack of a riparian buffer zone to slow runoff, trap sediment and stabilize banks. Additionally, deep trapezoidal channels lack a functioning flood plain and therefore cannot expel sediment as would occur during flood events along natural watercourses. The confinement of flow within an artificially deep channel accelerates the movement of water downstream, exacerbating flooding of neighboring properties.

The lack of water movement under low flow conditions can exacerbate impacts from organic loading and nutrient enrichment by limiting re-aeration of the stream. The amount of oxygen soluble in water decreases as temperature increases. This is one reason why tree shade is so important. The two main sources of oxygen in water are diffusion from the atmosphere and plant photosynthesis. Turbulence at the water surface is critical because it increases surface area and promotes diffusion, but channelization eliminates turbulence produced by riffles, meanders, and debris snags. Plant photosynthesis produces oxygen, but at night, respiration reverses the process and consumes oxygen.

Conversely, oxygen concentrations can become supersaturated during the day, due to abnormally high amounts of photosynthesis, causing gas bubble stress to both fish and invertebrate communities. Oxygen is also used by bacteria that decay dead organic matter. Nutrient enrichment can promote the growth of nuisance algae that subsequently dies and serves as food for bacteria. Under these conditions, oxygen can be depleted unless it is replenished from the air.

#### *Siltation and Sedimentation*

Whenever the natural flow regime is altered to facilitate drainage, increased amounts of sediment are likely to enter streams either by overland transport or increased bank erosion. The removal of wooded riparian areas furthers the erosion process. Channelization keeps all but the highest flow events confined within the artificially high banks. As a result, areas that were formerly flood plains and allowed for the removal of sediment from the primary stream channel no longer serve this function. As water levels fall following a rain event, interstitial spaces between larger rocks fill with sand and silt and the diversity of available habitat to support fish and macroinvertebrates is reduced. Silt also can clog the gills of both fish and macroinvertebrates, reduce visibility thereby excluding site feeding fish species, and smother the nests of lithophilic fishes. Lithophilic spawning fish require clean substrates with interstitial voids in which to deposit eggs. Conversely, pioneering species benefit. They are generalists and best suited for exploiting disturbed and less heterogeneous habitats. The net result is a lower diversity of aquatic species compared with a typical warmwater stream with natural habitats.

Sediment also impacts water quality, recreation, and drinking water. Nutrients absorbed to soil particles remain trapped in the watercourse. Likewise, bacteria, pathogens, and pesticides which also attach to suspended or bedload sediments become concentrated in waterways where the channel is functionally isolated from the landscape. Community drinking water systems address these issues with more costly advanced treatment technologies.

#### *Nutrient Enrichment*

The element of greatest concern is phosphorus because it is critical for plant growth and is often the limiting nutrient. The form that can be readily used by plants and therefore can stimulate nuisance algae blooms is orthophosphate ( $\text{PO}_4^{-3}$ ). The amount of phosphorus tied up in the nucleic acids of food and waste is actually quite low. This organic material is eventually converted to orthophosphate by bacteria. The amount of orthophosphate contained in synthetic detergents is a great concern however. It was for this reason that the General Assembly of the State of Ohio enacted a law in 1990 to limit phosphorus content in household laundry detergents sold in the Lake Erie drainage basin to 0.5% by weight. Inputs of phosphorus originate from both point and nonpoint sources. Most of the phosphorus discharged by point sources is soluble. Another characteristic of point sources is they have a continuous impact and are human in origin, for instance, effluents from municipal sewage treatment plants.

The contribution from failed on-lot septic systems can also be significant, especially if they are concentrated in a small area. The phosphorus concentration in raw waste water is generally 8-10 mg/l and after secondary treatment is generally 4-6 mg/l. Further removal requires the added cost of chemical addition. The most common methods use the addition of lime or alum to form a precipitate, so most phosphorus (80%) ends up in the sludge.

A characteristic of phosphorus discharged by nonpoint sources is that the impact is intermittent and associated with storm water runoff. Most of this phosphorus is bound tightly to soil particles and enters streams from erosion, although some comes from tile drainage. Urban storm water is more of a concern if combined sewer overflows are involved. The impact from rural storm water varies depending on land use and management practices and includes contributions from livestock feedlots and pastures and row crop agriculture. Crop fertilizer includes granular inorganic types and organic types such as manure or sewage sludge. Pasture land is especially a concern if the livestock have access to the stream. Large feedlots with manure storage lagoons create the potential for overflows and accidental spills. Land management is an issue because erosion is worse on streams without any riparian buffer zone to trap runoff. The impact is worse in streams that are channelized because they no longer have a functioning flood plain and cannot expel sediment during flooding. Oxygen levels must also be considered, because phosphorus is released from sediment at higher rates under anoxic conditions.

There is no numerical phosphorus criterion established in the Ohio Water Quality Standards, but there is a narrative criterion that states phosphorus should be limited to the extent necessary to prevent nuisance growths of algae and weeds (Administrative Code, 3745-1-04, Part E). Phosphorus loadings from large volume point source dischargers in the Lake Erie drainage basin are regulated by NPDES permit limits. The permit limit is a concentration of 1.0 mg/l in final effluent. Research conducted by the Ohio EPA indicates that a significant correlation exists between phosphorus and the health of aquatic communities (Miltner and Rankin, 1998). It was concluded that biological community performance in headwater and wadeable streams was highest where phosphorus concentrations were lowest. It was also determined that the lowest phosphorus concentrations were associated with the highest quality habitats, supporting the notion that habitat is a critical component of stream function. The report recommends WWH biocriteria of 0.08 mg/l in headwater streams (<20 mi<sup>2</sup> watershed size), 0.10 mg/l in wadeable streams (>20-200 mi<sup>2</sup>) and 0.17 mg/l in small rivers (>200-1000 mi<sup>2</sup>).

#### *Organic Enrichment and Low Dissolved Oxygen*

The amount of oxygen soluble in water is low and it decreases as temperature increases. This is one reason why tree shade is so important. The two main sources of oxygen in water are diffusion from the atmosphere and plant photosynthesis. Turbulence at the water surface is critical because it increases

surface area and promotes diffusion. Drainage practices such as channelization eliminate turbulence produced by riffles, meanders, and debris snags. Although plant photosynthesis produces oxygen by day, it is consumed by the reverse process of respiration at night. Oxygen is also consumed by bacteria that decay organic matter, so it can be easily depleted unless it is replenished from the air. Sources of organic matter include poorly treated waste water, sewage bypasses, and dead plants and algae. Dissolved oxygen criteria are established in the Ohio Water Quality Standards to protect aquatic life. The minimum and average limits are tiered values and linked to use designations (Administrative Code 3745-1-07, Table 7-1).

### *Ammonia*

Ammonia enters streams as a component of fertilizer and manure run-off and wastewater effluent. Ammonia gas ( $\text{NH}_3$ ) readily dissolves in water to form the compound ammonium hydroxide ( $\text{NH}_4\text{OH}$ ). In aquatic ecosystems an equilibrium is established as ammonia shifts from a gas to undissociated ammonium hydroxide to the dissociated ammonium ion ( $\text{NH}_4^{+1}$ ). Under normal conditions (neutral pH 7 and  $25^\circ\text{C}$ ) almost none of the total ammonia is present as gas, only 0.55% is present as ammonium hydroxide, and the rest is ammonium ion. Alkaline pH shifts the equation toward gaseous ammonia production, so the amount of ammonium hydroxide increases. This is important because while the ammonium ion is almost harmless to aquatic life, ammonium hydroxide is very toxic and can reduce growth and reproduction or cause mortality.

The concentration of ammonia in raw sewage is high, sometimes as much as 20-30 mg/l. Treatment to remove ammonia involves gaseous stripping to the atmosphere, biological nitrification and de-nitrification, and assimilation into plant and animal biomass. The nitrification process requires a long detention time and aerobic conditions like that provided in extended aeration treatment plants. Under these conditions, bacteria first convert ammonia to nitrite (*Nitrosomonas*) and then to nitrate (*Nitrobacter*). Nitrate can then be reduced by the de-nitrification process (*Pseudomonas*) and nitrogen gas and carbon dioxide are produced as by-products.

Ammonia criteria are established in the Ohio Water Quality Standards to protect aquatic life. The maximum and average limits are tiered values based on sample pH and temperature and linked to use designations (Administrative Code 3745-1-07, Tables 7-2 through 7-8).

### *Metals*

Metals can be toxic to aquatic life and hazardous to human health. Although they are naturally occurring elements many are extensively used in manufacturing and are byproducts of human activity. Certain metals like copper and zinc are essential in the human diet, but excessive levels are usually detrimental. Lead and mercury are of particular concern because they often trigger fish consumption advisories. Mercury is used in the production of chlorine gas and



caustic soda and in the manufacture of batteries and fluorescent light bulbs. In the environment it forms inorganic salts, but bacteria convert these to methylmercury and this organic form builds up in the tissues of fish. Extended exposure can damage the brain, kidneys, and developing fetus. The Ohio Department of Health (ODH) issued a statewide fish consumption advisory in 1997 advising women of child bearing age and children six and under not to eat more than one meal per week of any species of fish from waters of the state because of mercury. Lead is used in batteries, pipes, and paints and is emitted from burning fossil fuels. It affects the central nervous system and damages the kidneys and reproductive system. Copper is mined extensively and used to manufacture wire, sheet metal, and pipes. Ingesting large amounts can cause liver and kidney damage. Zinc is a by-product of mining, steel production, and coal burning and used in alloys such as brass and bronze. Ingesting large amounts can cause stomach cramps, nausea, and vomiting.

Metals criteria are established in the Ohio Water Quality Standards to protect human health, wildlife, and aquatic life. Three levels of aquatic life standards are established (Administrative Code 3745-1-07, Table 7-1) and limits for some elements are based on water hardness (Administrative Code 3745-1-07, Table 7-9). Human health and wildlife standards are linked to either the Lake Erie (Administrative Code 3745-1-33, Table 33-2) or Ohio River (Administrative Code 3745-1-34, Table 34-1) drainage basins. The drainage basins also have limits for additional elements not established elsewhere that are identified as Tier I and Tier II values.

### ***Bacteria***

High concentrations of either fecal coliform bacteria or *Escherichia coli* (*E. coli*) in a lake or stream may indicate contamination with human pathogens. People can be exposed to contaminated water while wading, swimming, and fishing. Fecal coliform bacteria are relatively harmless in most cases, but their presence indicates that the water has been contaminated with feces from a warm-blooded animal. Although intestinal organisms eventually die off outside the body, some will remain virulent for a period of time and may be dangerous sources of infection. This is especially a problem if the feces contained pathogens or disease producing bacteria and viruses. Reactions to exposure can range from an isolated illness such as skin rash, sore throat, or ear infection to a more serious wide spread epidemic. Some types of bacteria that are a concern include *Escherichia*, which cause diarrhea and urinary tract infections, *Salmonella*, which cause typhoid fever and gastroenteritis (food poisoning), and *Shigella*, which cause severe gastroenteritis or bacterial dysentery. Some types of viruses that are a concern include polio, hepatitis A, and encephalitis. Disease causing microorganisms such as cryptosporidium and giardia are also a concern.

Since fecal coliform bacteria are associated with warm-blooded animals, there are both human and animal sources. Human sources, including effluent from sewage treatment plants or discharges by on-lot septic systems, are a more

continuous problem. Bacterial contamination from combined sewer overflows are associated with wet weather events. Animal sources are usually more intermittent and are also associated with rainfall, except when domestic livestock have access to the water. Large livestock farms store manure in holding lagoons and this creates the potential for an accidental spill. Liquid manure applied as fertilizer is a runoff problem if not managed properly and it sometimes seeps into field tiles.

Bacteria criteria for the recreational use are established in the Ohio Water Quality Standards to protect human health. The maximum and average limits are tiered values and linked to use designation, but only apply during the May 1-October 15 recreation season (Administrative Code 3745-1-07, Table 7-13). The standards also state that streams must be free of any public health nuisance associated with raw or poorly treated sewage during dry weather conditions (Administrative Code 3745-1-04, Part F).

Revisions to Ohio's recreation criteria will likely be effective by the end of the 2010 calendar year. The draft criteria (3745-1-41) will result in several changes when they become effective;

- 1) *E. coli* will be the only indicator organism used to evaluate recreation. The use of fecal coliform will be discontinued.
- 2) The recreation season will be May 1 – Oct. 31 instead of ending on Oct. 15.
- 3) Geometric mean content will be computed on a seasonal basis instead of monthly.
- 4) Geometric mean content will be the sole basis of use attainment status when 2 or more samples are taken.
- 5) Primary Contact Recreation (PCR) will be divided into three separate categories each with specific numerical criteria: Class A – high use paddling streams, Class B – most typical streams and Class C – historically channelized streams that drain < 3.1 mi<sup>2</sup>.

#### *Sediment Contamination*

Chemical quality of sediment is a concern because many pollutants bind strongly to soil particles and are persistent in the environment. Some of these compounds accumulate in the aquatic food chain and trigger fish consumption advisories, but others are simply a contact hazard because they cause skin cancer and tumors. The physical and chemical nature of sediment is determined by local geology, land use, and contribution from manmade sources. As some materials enter the water column they are attracted to the surface electrical charges associated with suspended silt and clay particles. Others simply sink to the bottom due to their high specific gravity. Sediment layers form as suspended particles settle, accumulate, and combine with other organic and inorganic materials. Sediment is the most physically, chemically, and biologically reactive at the water interface because this is where it is affected by sunlight, current,

wave action, and benthic organisms. Assessment of the chemical nature of this layer can be used to predict ecological impact.

The Ohio EPA evaluation of sediment chemistry results are evaluated using a dual approach, first by ranking relative concentrations based on a system developed by Ohio EPA (2005) and then by determining the potential for toxicity based on guidelines developed by MacDonald et al (2000). The Ohio EPA system was derived from samples collected at ecoregional reference sites. Specific Reference Values are site specific ecoregional based metals concentrations and are used to identify contaminated stream reaches. The MacDonald guidelines are consensus based using previously developed values. The system predicts that sediments below the threshold effect concentration (TEC) are absent of toxicity and those greater than the probable effect concentration (PEC) are toxic.

Sediment samples collected by the Ohio EPA are measured for a number of physical and chemical properties. Physical attributes included % particle size distribution (sand  $\geq 60 \mu$ , silt  $5-59 \mu$ , clay  $\leq 4 \mu$ ), % solids, and % organic carbon. Most locations sampled had an abundance of sediment, and no difficulties were experienced in locating ample volumes of sediment for analysis. Fine grained sediments are deposited in flood plains of natural streams during periods of high flow. This scenario changes if the stream is impounded by a dam or channelized. Chemical attributes included metals, volatile and semi-volatile organic compounds, pesticides, and poly-chlorinated biphenyls (PCBs).

## **MATERIALS and METHODS**

All physical, chemical, and biological field, laboratory, data processing, and data analysis methodologies and procedures adhere to those specified in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio Environmental Protection Agency 1989a) and Biological Criteria for the Protection of Aquatic Life, Volumes I-III (Ohio Environmental Protection Agency 1987a, 1987b, 1989b, 1989c, 2006, 2008a, 2008b), The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application (Rankin 1989 and 1995) for aquatic habitat assessment, and the Ohio EPA Sediment Sampling Guide and Methodologies (Ohio EPA 2001). Sampling locations are listed in Table 1.

### **Determining Use Attainment Status**

Use attainment status is a term describing the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1). Assessing aquatic use attainment status involves a primary reliance on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-15). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on multimetric biological indices including the IBI and MIwb, indices

measuring the response of the fish community, and the ICI, which indicates the response of the macroinvertebrate community. Three attainment status results are possible at each sampling location - full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria. Non-attainment means that none of the applicable indices meet the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table (Table 2) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (*i.e.*, full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and a sampling location description.

### **Habitat Assessment**

Physical habitat was evaluated using the QHEI developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989 and 1995). Various attributes of the habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient are some of the habitat characteristics used to determine the QHEI score which generally ranges from 20 to less than 100. The QHEI is used to evaluate the characteristics of a stream segment, as opposed to the characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values greater than 60 are *generally* conducive to the existence of warmwater faunas whereas scores less than 45 generally cannot support a warmwater assemblage consistent with the WWH biological criteria. Scores greater than 75 frequently reflect habitat conditions which have the ability to support exceptional warmwater faunas.

### **Sediment and Surface Water Assessment**

Fine grain sediment samples were collected in the upper 4 inches of bottom material at each location using decontaminated stainless steel scoops and excavated using nitrile gloves. Decontamination of sediment sampling equipment followed the procedures outlined in the Ohio EPA sediment sampling guidance manual (Ohio EPA 2001). Sediment grab samples were homogenized in stainless steel pans (material for VOC analysis was not homogenized), transferred into glass jars with teflon® lined lids, placed on ice (to maintain 4°C) in a cooler, and shipped to Ohio EPA Division of Environmental Services. Sediment data is reported on a dry weight basis. Surface water samples were collected, preserved and delivered in appropriate containers to Ohio EPA Division of Environmental Services. Surface water samples were evaluated

using comparisons to Ohio Water Quality Standards criteria, reference conditions, or published literature. Sediment evaluations were conducted using guidelines established in MacDonald et al. (2000) and Ohio Specific Reference Values (2003).

### **Recreation Use Assessment**

Recreation use attainment was determined using the draft criteria that will likely be adopted during the 2010 calendar year. The draft criteria (OAC 3745-1-41) will result in several changes when they become effective:

- 1) *E. coli* will be the only indicator organism used to evaluate recreation. The use of fecal coliform will be discontinued.
- 2) The recreation season will be May 1 – Oct. 31 instead of ending on Oct. 15.
- 3) Geometric mean content will be computed on a seasonal basis instead of monthly.
- 4) Geometric mean content will be the sole basis of use attainment status when 2 or more samples are taken.
- 5) Primary Contact Recreation (PCR) will be divided into three separate categories each with specific numerical criteria: Class A – high use paddling streams, Class B – most typical streams and Class C – historically channelized streams that drain < 3.1 mi<sup>2</sup>.

The draft new rules and criteria associated with each class and sub-class use are provided in Appendix Tables A-9 and A-10.

### **Macroinvertebrate Community Assessment**

Macroinvertebrates were collected from artificial substrates and from the natural habitats. The artificial substrate collection provided quantitative data and consisted of a composite sample of five modified Hester-Dendy multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection, a qualitative multihabitat composite sample was also collected. This sampling effort consisted of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, margin). Detailed discussion of macroinvertebrate field and laboratory procedures is contained in Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989b, 2008b).

### **Fish Community Assessment**

Fish were sampled using pulsed DC electrofishing methods. Fish were processed in the field, and included identifying each individual to species, counting, weighing, and recording any external abnormalities. Discussion of the fish community assessment methodology used in this report is contained in

Biological Criteria for the Protection of Aquatic Life: Volume III, Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities (Ohio EPA 1989b, 2008b).

### **Causal Associations**

Using the results, conclusions, and recommendations of this report requires an understanding of the methodology used to determine the use attainment status and assigning probable causes and sources of impairment. The identification of impairment in rivers and streams is straightforward - the numerical biological criteria are used to judge aquatic life use attainment and impairment (partial and non-attainment). The rationale for using the biological criteria, within a weight of evidence framework, has been extensively discussed elsewhere (Karr *et al.* 1986; Karr 1991; Ohio EPA 1987a,b; Yoder 1989; Miner and Borton 1991; Yoder 1991; Yoder 1995). Describing the causes and sources associated with observed impairments relies on an interpretation of multiple lines of evidence including water chemistry data, sediment data, habitat data, effluent data, land use data, and biological results (Yoder and Rankin 1995a, 1995b, and 1995c). Thus the assignment of principal causes and sources of impairment in this report represent the association of impairments (based on response indicators) with stressor and exposure indicators. The reliability of the identification of probable causes and sources is increased where many such prior associations have been identified, or have been experimentally or statistically linked together. The ultimate measure of success in water resource management is the restoration of lost or damaged ecosystem attributes including aquatic community structure and function. While there have been criticisms of misapplying the metaphor of ecosystem “health” compared to human patient “health” (Suter 1993), in this document we are referring to the process for evaluating biological integrity and causes or sources associated with observed impairments, not whether human health and ecosystem health are analogous concepts.

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## **Appendix B – Inorganic Water Chemistry Results**

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 01					
SAWMILL CK AT BOOS RD					
RM 1.1					
K01K21					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200	211	96	
0.073	<0.050	<0.050	<0.050	<0.20	
<2.0	<2.0	<2.0	2.1	7.4	
55	60	52	57	0.10	
<0.20	<0.20	<0.20	<0.20	<0.020	
80	84	72	77	0.115	
81.9	99.9	107	109	5	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	<20	<20	84	
2.8	2.4	2.7	2.7	1040	
286	309	266	287	349	
199	124	112	339	0.43	
<2.0	<2.0	<2.0	<2.0	638	
21	24	21	23	<5	
16	26	53	80	<200	
<0.20	<0.20	<0.20	<0.20	<0.050	
8.1	6.6	7.5	7.8	2.6	
4.16	1.38	0.35	0.15	66	
0.087	<0.020	<0.020	<0.020	<0.20	
0.024	0.019	0.041	0.033	90	
3	3	3	4	144	
<2.0	<2.0	<2.0	<2.0	<2.0	
52	58	64	64	20	
780	889	839	871	3.0	
265	305	271	287	328	
0.75	0.72	0.61	0.58	166	
488	508	522	506	<2.0	
<5	<5	<5	15	25	
<10	<10	<10	<10	<10	
14.72	17.81	19.42	17.96	18.35	
7.65	7.92	8.73	7.79		
8.25	8.34	7.59	9.38	7.29	
81.5	88	82.8	99.2	77.7	
610.6	746.4	752.6	722.9	884.7	
759.8	865.3	842.4	835.3	1013.4	

HUC12: 20410001101 02					
PIPE CK JUST UPST TURNPIKE AT HARRIS RD					
RM 10.81					
U05K18					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200			
<0.050	<0.050	<0.050			
<2.0	<2.0	2.5			
35	42	35			
<0.20	<0.20	<0.20			
64	91	97			
62.0	82.3	88.7			
<2.0	<2.0	<2.0			
<20	<20	<20			
2.7	<2.0	2.0			
250	499	489			
85	87	106			
<2.0	<2.0	<2.0			
22	66	60			
<10	<10	21			
<0.20	<0.20	<0.20			
3.3	3.0	3.5			
3.55	0.16	<0.10			
0.029	<0.020	<0.020			
0.022	0.020	0.144			
3	5	5			
<2.0	<2.0	<2.0			
40	45	47			
651	1130	1130			
231	1230	1110			
0.52	0.29	0.56			
398	774	904			
<5	<5	9			
<10	<10	<10			
14.73	20.63	23.6			
8.05	8.45	9.81			
10.89	10.36	12.25			
107.5	115.7	144.9			
518.8	1010.2	1097.7			
645.3	1102.3	1127.9			

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APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 02					
PIPE CK AT PATTEN TRACT RD					
RM 8.18					
U05K17					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200	355	516	
0.128	0.054	0.092	0.187	0.138	
<2.0	<2.0	2.0	2.4	3.2	
42	56	55	39	42	
<0.20	<0.20	<0.20	<0.20	<0.20	
79	94	102	78	75	
90.3	86.6	88.1	46.5	61.8	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	<20	<20	20	
2.9	2.3	<2.0	2.5	6.5	
284	449	485	277	266	
256	234	284	564	893	
<2.0	<2.0	<2.0	<2.0	<2.0	
21	52	56	20	19	
24	30	75	89	140	
<0.20	<0.20	<0.20	<0.20	<0.20	
4.4	4.1	4.1	4.5	6.4	
4.54	1.02	1.56	2.00	1.29	
0.048	<0.020	<0.020	0.062	0.049	
0.040	0.026	0.057	0.137	0.210	
3	4	5	4	4	
<2.0	<2.0	<2.0	<2.0	<2.0	
55	49	48	28	39	
796	1080	1110	657	696	
220	889	994	327	271	
0.72	0.49	0.50	0.96	0.80	
482	704	848	412	436	
6	<5	6	17	34	
<10	<10	<10	<10	<10	
14.12	18.32	20.1	18.24	18.64	
7.78	8	8.85	7.92		
9.81	9.67	9.04	9.76	7.65	
95.7	103.1	100	103.8	82	
615.1	920.3	1017.4	567	601.8	
776.5	1054.9	1122.4	651.1	684.9	

HUC12: 20410001101 02					
PIPE CK AT SCHENK RD					
RM 6.66					
U05K16					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
233	386	336	738	523	
0.067	<0.050	0.092	0.111	0.113	
<2.0	<2.0	2.2	2.9	3.0	
48	62	61	46	42	
<0.20	<0.20	<0.20	<0.20	<0.20	
84	95	100	70	67	
80.2	85.2	89.8	69.0	63.6	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	30	<20	25	32	
2.6	2.4	2.6	3.2	3.7	
300	439	472	270	241	
392	574	609	1320	965	
<2.0	<2.0	<2.0	<2.0	<2.0	
22	49	54	23	18	
38	53	116	271	301	
<0.20	<0.20	<0.20	<0.20	<0.20	
5.0	4.9	5.9	7.0	6.0	
4.41	1.33	0.69	0.30	0.25	
0.053	<0.020	<0.020	<0.020	<0.020	
0.034	0.031	0.061	0.091	0.132	
3	4	5	4	4	
<2.0	<2.0	<2.0	<2.0	<2.0	
48	49	48	44	41	
784	1050	1120	729	671	
236	792	948	395	317	
0.54	0.53	0.51	0.87	0.80	
482	686	846	484	408	
11	16	37	47	37	
<10	<10	<10	16	<10	
13.99	17.78	19.52	18.13	19.07	
7.9	7.92	8.78	7.84		
9.58	9.06	8.64	8.81	7.06	
93.2	95.5	94.5	93.5	76.3	
605.4	886.4	1007.8	620.9	578.1	
766.6	1028.1	1125.7	714.7	652	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
BOD20	mg/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 02					
PIPE CK AT COLUMBUS ST					
RM 2.32					
U05K15					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
303	432	504	315	421	
<0.050	0.064	0.073	0.050	0.051	
<2.0	<2.0	2.3	3.3	4.1	
48	67	70	47	45	
3.4	4.3	<3.0	3.5	3.7	
<0.20	<0.20	<0.20	<0.20	<0.20	
86	100	104	73	71	
78.9	84.1	90.3	94.3	105	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	20	<20	25	22	
2.8	2.4	2.8	2.4	3.2	
309	423	486	306	272	
488	648	862	477	764	
<2.0	<2.0	2.5	<2.0	<2.0	
23	42	55	30	23	
37	55	80	105	146	
<0.20	<0.20	<0.20	<0.20	<0.20	
4.5	5.0	4.9	5.3	5.7	
7.75	1.32	0.59	0.25	0.25	
0.058	<0.020	<0.020	<0.020	<0.020	
0.037	0.031	0.031	0.052	0.068	
0.114	0.051	0.068	0.091	0.129	
4	4	5	5	5	
<2.0	<2.0	<2.0	<2.0	<2.0	
52	48	50	53	69	
796	1020	1110	858	845	
275	594	901	454	368	
0.48	0.81	0.60	0.78	0.73	
482	634	822	530	514	
11	24	33	12	18	
21	<10	50	<10	<10	
15.11	18.7	20.75	18.01	18.5	
7.81	7.99	8.84	7.79		
8.97	9.03	8.95	10.2	6.59	
89.4	97	100.2	108	70.5	
625.4	878.6	1029.7	740.2	741	
771	998.7	1120.5	854.1	846	

HUC12: 20410001101 02					
TAYLOR DITCH AT BOGART RD					
RM 2.64					
U05K20					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200				
<0.050	<0.050				
<2.0	<2.0				
29	31				
<0.20	<0.20				
97	109				
14.0	29.3				
<2.0	<2.0				
<20	<20				
<2.0	<2.0				
341	383				
247	201				
<2.0	<2.0				
24	27				
41	89				
<0.20	<0.20				
4.2	4.9				
<0.10	0.10				
<0.020	<0.020				
0.030	0.030				
2	3				
<2.0	<2.0				
11	16				
645	750				
234	268				
0.35	0.73				
490	516				
<5	10				
<10	<10				
13.2	18.86				
7.73	7.78				
9.32	11.07				
89	119.3				
490.5	653.7				
633.2	740.5				

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 02					
TAYLOR DITCH AT DEWITT AVE					
RM 0.80					
U05K19					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200		<200	<200	
0.173	<0.050		0.148	0.462	
6.0	4.2		4.2	3.6	
15	17		31	24	
<0.20	<0.20		<0.20	<0.20	
242	257		317	360	
128	135		154	143	
<2.0	<2.0		<2.0	<2.0	
21	<20		<20	<20	
2.5	<2.0		<2.0	<2.0	
983	1080		1320	1500	
238	327		205	120	
<2.0	<2.0		<2.0	<2.0	
92	106		129	145	
55	63		41	23	
<0.20	<0.20		<0.20	<0.20	
6.5	6.2		7.0	9.2	
0.31	<0.10		<0.10	<0.10	
<0.020	<0.020		<0.020	0.022	
0.060	0.029		0.031	<0.010	
9	9		12	11	
2.5	2.9		2.9	3.1	
73	76		84	76	
1880	2080		2350	2270	
4490	4880		6230	7110	
0.98	0.91		1.00	0.97	
1500	1640		2180	2010	
6	6		<5	<5	
14	<10		<10	<10	
17.61	24.8		22.32	23.26	
7.75	8.11		7.62		
8.12	9.29		9.3	8.21	
85.5	112.6		107.7	96.8	
1464.9	2037.9		2198.9	2140	
1705.8	2045.8		2317.7	2213.5	

HUC12: 20410001101 02					
PLUM BROOK AT PERKINS RD					
RM 1.05					
K01K20					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
375	603	<200	<200	<200	
0.163	0.306	0.125	0.166	0.207	
<2.0	2.6	3.8	4.1	4.6	
52	53	39	40	40	
<0.20	<0.20	<0.20	<0.20	<0.20	
92	90	76	69	73	
77.2	80.4	82.2	78.9	106	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	<20	21	42	
16.6	2.8	2.0	<2.0	2.0	
333	332	276	246	265	
802	1130	366	393	446	
<2.0	<2.0	<2.0	<2.0	<2.0	
25	26	21	18	20	
203	233	289	742	352	
<0.20	<0.20	<0.20	<0.20	<0.20	
10.1	8.8	7.6	5.9	5.6	
1.49	0.38	<0.10	0.10	3.61	
0.070	0.048	<0.020	<0.020	<0.020	
0.043	0.066	0.069	0.100	0.140	
3	3	3	3	3	
<2.0	<2.0	<2.0	<2.0	<2.0	
48	48	51	49	64	
847	867	759	714	859	
276	283	249	233	249	
0.95	0.95	0.65	0.86	1.19	
554	502	490	462	540	
21	33	13	6	7	
11	<10	<10	<10	<10	
15.11	19.64	21.51	20.1	20.68	
7.38	7.62	8.53	7.54		
5.76	4.53	5.67	6.67	4.37	
57.4	49.5	64.4	73.7	48.9	
668	760.8	717.4	636.4	775.4	
823.5	847.6	768.6	702.1	845.2	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 03					
MILLS CK AT PORTLAND RD					
RM 10.40					
U05S07					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	264	574	590	
0.109	0.055	0.051	0.079	<0.050	
<2.0	2.8	3.0	4.2	3.9	
33	36	32	33	31	
<0.20	<0.20	<0.20	<0.20	<0.20	
75	60	63	54	54	
106	192	169	279	264	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	26	22	27	26	
5.6	10.0	7.3	9.3	10.5	
278	228	227	188	192	
186	195	333	838	798	
<2.0	<2.0	<2.0	2.0	<2.0	
22	19	17	13	14	
22	18	34	118	73	
<0.20	<0.20	<0.20	<0.20	<0.20	
3.8	5.8	5.1	8.5	7.3	
9.50	10.4	10.4	9.92	18.6	
0.156	0.105	0.030	0.021	0.029	
0.228	0.303	0.437	0.807	0.775	
10	18	14	29	28	
<2.0	<2.0	<2.0	2.0	2.5	
187	370	327	637	571	
1320	2030	1860	2540	2370	
226	261	245	241	293	
1.06	1.10	0.96	1.48	1.03	
820	1260	1210	1620	1500	
<5	<5	<5	18	15	
10	12	21	42	40	
13.98	18.05	19.14	17.76	18.13	
7.58	7.84	8.8	7.98		
8.37	7.79	8.48	11.25	7.97	
81.5	82.9	92.2	119.2	85	
1016.5	1724.8	1669.2	2157.7	2010	
1287.4	1988.6	1879.8	2504	2313.8	

HUC12: 20410001101 03					
MILLS CREEK AT SR 99					
RM 6.03					
U05S06					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200	229	276	
<0.050	<0.050	<0.050	<0.050	0.064	
<2.0	2.1	2.7	4.1	4.4	
33	43	37	47	40	
<0.20	<0.20	<0.20	<0.20	<0.20	
80	79	72	68	63	
76.3	148	130	230	183	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	<20	24	26	
3.5	6.2	5.2	12.6	7.7	
290	292	258	240	227	
68	55	205	430	437	
<2.0	<2.0	<2.0	<2.0	<2.0	
22	23	19	17	17	
<10	<10	34	104	98	
<0.20	<0.20	<0.20	<0.20	<0.20	
3.3	5.6	5.1	8.8	7.4	
8.75	6.95	6.90	4.62	6.10	
0.052	0.043	0.022	<0.020	<0.020	
0.130	0.168	0.346	0.598	0.549	
7	15	12	22	20	
<2.0	<2.0	<2.0	<2.0	<2.0	
102	237	230	391	549	
1000	1610	1460	2120	2060	
237	302	273	281	304	
0.45	1.09	0.79	1.47	0.99	
612	978	926	1350	1330	
<5	<5	6	6	7	
<10	<10	11	23	17	
15.01	20.27	22.1	20.98	20.92	
8.11	8.26	9.09	8.11		
11.5	11.38	9.88	10.7	9.27	
114.4	126.4	113.7	120.8	104.4	
787.1	1424.1	1391.4	1935.7	1881.5	
972.7	1565.5	1473	2096.8	2040.5	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 03					
MILLS CREEK AT BOGART RD					
RM 5.20					
U05P07					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200	243	<200	
<0.050	<0.050	0.050	0.073	<0.050	
<2.0	2.2	2.8	4.6	4.6	
36	38	38	44	30	
<0.20	<0.20	<0.20	<0.20	<0.20	
85	77	74	68	59	
77.8	136	136	245	180	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	20	<20	27	29	
3.8	5.6	5.5	11.9	7.5	
307	287	267	240	209	
62	<50	145	413	135	
<2.0	<2.0	<2.0	<2.0	<2.0	
23	23	20	17	15	
<10	<10	28	61	29	
<0.20	<0.20	<0.20	<0.20	<0.20	
3.5	5.6	5.2	10.3	6.9	
8.35	5.85	6.15	5.28	3.75	
0.051	0.027	<0.020	<0.020	<0.020	
0.152	0.236	0.338	0.622	0.523	
8	14	13	24	19	
<2.0	<2.0	<2.0	<2.0	<2.0	
108	214	239	412	445	
1020	1490	1500	2260	1970	
249	293	282	274	273	
0.65	1.22	0.89	1.49	1.16	
620	916	964	1420	1240	
<5	<5	9	12	<5	
<10	<10	16	20	19	
14.97	22.13	23.45	24.33	24.04	
8.29	8.99	9.36	8.59		
11.95	13.67	10.14	9.8	10.5	
118.7	157.3	119.7	117.9	125.5	
794.4	1383.3	1476	2202.8	1895.4	
982.6	1463.7	1521	2231.3	1931	

HUC12: 20410001101 03					
MILLS CK AT STRUB RD					
RM 3.70					
U05S18					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200	<200	<200	
<0.050	<0.050	<0.050	<0.050	<0.050	
<2.0	2.2	2.2	4.4	4.6	
35	37	31	49	35	
<0.20	<0.20	0.36	<0.20	<0.20	
87	75	59	78	55	
73.6	123	94.7	231	158	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	23	24	26	
2.9	4.9	5.1	10.4	7.3	
312	286	221	277	195	
89	94	280	239	220	
<2.0	<2.0	<2.0	<2.0	<2.0	
23	24	18	20	14	
<10	<10	49	31	30	
<0.20	<0.20	<0.20	<0.20	<0.20	
3.4	5.4	4.0	9.8	7.3	
8.24	5.29	5.75	3.85	2.60	
0.062	0.030	<0.020	<0.020	<0.020	
0.133	0.183	0.136	0.568	0.567	
7	12	12	23	17	
<2.0	<2.0	<2.0	<2.0	<2.0	
86	170	115	406	391	
965	1370	982	2140	1780	
266	336	244	341	251	
0.70	1.04	1.11	1.63	1.08	
582	838	616	1360	1130	
<5	<5	11	7	<5	
<10	<10	<10	13	26	
15.14	20.61	21.79	21.21	21.22	
8.15	8.79	9.19	8.7		
11.44	13.04	10.47	14.2	12.22	
114.1	145.7	119.8	160.9	138.4	
760.4	1231	1334.8	1956.6	1632.9	
936.8	1343.7	1421.9	2109.1	1759.8	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
BOD20	mg/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 03					
MILLS CREEK AT PERKINS AVE					
RM 1.35					
U05P05					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	315	<200	<200	<200	
0.089	0.114	0.051	0.063	<0.050	
<2.0	2.2	2.4	4.7	5.3	
33	34	48	43	39	
4.5	8.4	3.5	5.2	5.5	
<0.20	<0.20	<0.20	<0.20	<0.20	
81	61	121	76	67	
64.8	115	114	143	207	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	<20	28	23	
3.4	8.8	3.4	6.0	6.6	
297	231	508	289	241	
200	600	281	326	217	
<2.0	<2.0	<2.0	<2.0	<2.0	
23	19	50	24	18	
24	48	53	62	37	
<0.20	<0.20	<0.20	<0.20	<0.20	
4.0	4.3	5.1	8.5	7.7	
4.26	1.54	2.13	2.43	3.13	
0.059	0.067	<0.020	<0.020	0.020	
0.099	0.073	0.110	0.208	0.303	
0.070	0.119	0.146	0.292	0.325	
6	6	8	14	17	
<2.0	<2.0	<2.0	<2.0	<2.0	
63	106	122	250	313	
871	968	1470	1660	2060	
276	250	1240	497	369	
0.61	0.86	0.83	1.67	1.00	
530	544	1030	1050	1280	
<5	18	20	9	<5	
<10	<10	16	16	11	
15.05	21.64	21.35	21.61	21.41	
8.1	8.24	9.13	8.51		
10.21	8.88	10.59	11.35	10.31	
101.6	101.2	120.1	129.4	117.2	
678.5	884.7	1374.7	1530	1843.5	
837.7	945.4	1477.8	1636.1	1979.2	

HUC12: 20410001101 03					
CASWELL DITCH (MILLS CK TRIB 3.95) AT BOGART RD					
RM 0.85					
U05W37					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
	<200	<200	630	355	
	<0.050	<0.050	0.581	0.470	
	<2.0	<2.0	3.5	3.7	
	28	43	54	54	
	<0.20	<0.20	<0.20	<0.20	
	82	147	120	119	
	54.1	84.3	81.4	83.0	
	<2.0	<2.0	<2.0	<2.0	
	<20	<20	27	29	
	<2.0	<2.0	3.8	<2.0	
	332	643	518	524	
	117	249	1100	588	
	<2.0	<2.0	<2.0	<2.0	
	31	67	53	55	
	<10	58	1020	849	
	<0.20	<0.20	<0.20	<0.20	
	3.0	5.0	5.9	5.6	
	2.45	1.20	0.80	0.25	
	0.051	<0.020	0.052	0.033	
	0.018	0.026	0.101	0.061	
	2	5	6	5	
	<2.0	<2.0	<2.0	<2.0	
	27	44	43	44	
	747	1320	1130	1170	
	582	1700	1290	1450	
	0.45	0.39	1.27	1.14	
	454	1080	860	852	
	<5	6	29	13	
	<10	<10	<10	<10	
	22.21	21.87	23.66	21.52	
	8.7	9.14	7.81		
	17.35	10.77	8.2	7.36	
	199.6	123.3	97	83.7	
	693.9	1253.8	1090.4	1074.3	
	732.9	1333.5	1119	1150.7	



DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

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Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 03					
SNYDERS DITCH NEAR RESERVOIRS AT RR RM 4.98 U05K13					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200	<200	<200	
0.054	0.203	0.056	<0.050	<0.050	
<2.0	<2.0	<2.0	2.9	2.5	
48	31	38	20	21	
<0.20	<0.20	<0.20	<0.20	<0.20	
85	45	64	36	33	
24.3	23.4	21.7	21.9	22.1	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	85	<20	21	<20	
<2.0	<2.0	2.0	<2.0	<2.0	
319	170	250	143	132	
145	177	192	288	94	
<2.0	<2.0	<2.0	<2.0	<2.0	
26	14	22	13	12	
25	58	46	46	65	
<0.20	<0.20	<0.20	<0.20	<0.20	
3.5	<2.0	2.9	<2.0	<2.0	
14.1	1.06	2.76	0.36	0.25	
0.060	0.049	0.046	<0.020	<0.020	
0.016	0.095	0.046	0.029	0.020	
2	4	3	4	5	
<2.0	<2.0	<2.0	<2.0	<2.0	
13	8	11	8	7	
654	388	532	327	315	
211	127	170	111	110	
0.41	0.57	0.69	0.50	1.24	
420	226	364	242	204	
<5	<5	<5	11	<5	
<10	<10	<10	<10	22	
13.77	16.19	17.64	19.13	21.19	
7.32	7.64	8.22	8.02		
10.99	8.83	9	12.16	8.61	
106.3	89.9	94.5	131.5	97	
496.1	314.4	457	283.8	284.7	
631.5	378	531.7	319.6	307.1	

HUC12: 20410001101 03					
SNYDERS DITCH UPST BELLEVUE WWTP AT GOODRICH RD RM 3.85 U05S11					
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009	
<200	<200	<200	<200	214	
0.137	0.394	0.068	0.540	0.335	
<2.0	<2.0	<2.0	2.9	3.2	
48	53	36	42	46	
<0.20	<0.20	<0.20	<0.20	<0.20	
82	73	62	58	65	
32.5	67.4	29.4	69.0	85.1	
<2.0	<2.0	<2.0	<2.0	<2.0	
23	<20	<20	<20	<20	
<2.0	<2.0	2.1	2.3	2.8	
312	289	262	260	278	
183	220	126	299	488	
<2.0	<2.0	<2.0	<2.0	<2.0	
26	26	26	28	28	
17	73	18	95	92	
<0.20	<0.20	<0.20	<0.20	<0.20	
3.2	2.7	2.9	2.9	2.9	
8.72	2.87	2.39	1.65	1.77	
0.072	0.094	0.021	0.152	0.144	
0.023	0.039	0.032	0.057	0.060	
2	4	3	5	6	
<2.0	<2.0	<2.0	<2.0	<2.0	
18	40	16	40	55	
664	751	569	707	795	
213	222	175	247	330	
0.31	0.75	0.62	1.28	0.85	
410	420	390	412	468	
<5	<5	5	5	8	
<10	<10	<10	<10	<10	
13.71	16.81	18.13	17.26	18.06	
7.63	7.82	8.85	7.77		
10.09	7.62	8.76	8.64	6.83	
97.5	78.7	92.9	90	72.4	
505	616.2	494.4	589.4	671.4	
643.8	730.4	569.1	691.6	774.1	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
FIELD PARAMETERS	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001101 03				
SNYDERS DITCH DST BELLEVUE WWTP AT KNAUSS RD				
RM 2.46				
U05S09				
6/1/2009	6/15/2009	7/6/2009	7/20/2009	8/3/2009
350	<200	261	253	359
0.369	0.479	0.129	0.101	0.053
<2.0	2.5	2.4	3.2	3.5
31	<15	21	<15	<15
<0.20	<0.20	<0.20	<0.20	<0.20
69	50	59	49	52
121	268	150	275	290
<2.0	<2.0	<2.0	<2.0	<2.0
<20	28	21	28	34
6.9	10.1	5.4	8.3	10.6
267	195	217	172	187
485	183	309	315	437
<2.0	<2.0	<2.0	<2.0	<2.0
23	17	17	12	14
47	49	19	24	25
<0.20	<0.20	<0.20	<0.20	<0.20
4.0	4.2	3.7	6.2	5.9
8.29	16.1	10.6	16.6	21.6
0.298	1.03	0.177	0.049	0.065
0.294	0.409	0.428	0.741	0.742
11	20	12	25	26
<2.0	<2.0	<2.0	<2.0	2.2
221	520	290	648	627
1440	2590	1710	2670	2620
235	259	227	227	286
1.28	1.63	2.33	1.42	1.41
886	1620	1100	1680	1630
18	<5	10	6	9
14	12	21	33	36
14.63	18.48	19.71	19.29	19.57
7.13	7.72	8.7	8.03	
7.73	6.81	8.38	10.53	8.16
76.4	73.1	92.1	115.1	89.7
1114.4	2221.3	1545.4	2323.5	2262.8
1389.7	2537.5	1719.2	2607.8	2524.4

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Ammonia	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
FIELD PARAMETERS	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 01					
LITTLE PICKEREL CREEK AT STOCKER RD (ALP YETTER RD)					
RM 2.00 201385					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
0.052	0.050	<0.050	<0.050	<0.050	
34.1	35.2	33.8	34.7	32.6	
<20	<20	<20	<20	<20	
2.05	0.55	0.42	0.24	0.19	
<0.020	<0.020	<0.020	<0.020	<0.020	
0.021	0.018	0.012	0.010	0.013	
1720	1860	1890	1930	1950	
0.47	0.38	0.32	0.40	0.40	
1430	1650	1760	1770	1750	
12	11	6	5	7	
13.17	13.7	14.71	15	15.98	
7.79	7.92	7.7	7.85	7.88	
10.79	10.53	10.54	11.15	10.07	
103.3	102.1	104.5	111.2	102.6	
1275.9	1462.5	1502.9	1554.8	1605.3	
1648.1	1865.3	1870.6	1921.7	1939.5	

HUC12: 20410001102 01					
COLD CK AT BARSHAR RD					
RM 0.36 300670					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
0.122	<0.050	<0.050	<0.050		
29.5	31.0	28.8	29.7		
<20	<20	<20	<20		
1.06	0.11	<0.10	<0.10		
<0.020	<0.020	<0.020	<0.020		
0.034	0.022	0.021	0.011		
1710	1860	1820	1830		
0.61	0.45	0.27	0.32		
1450	1620	1680	1650		
13	5	6	<5		
13.38	14.63	14.92	15.32		
7.55	7.76	7.79	7.75		
9.57	10.46	11.47	14.36		
92.1	103.5	114.2	144.2		
1285.1	1489.7	1461.8	1489.8		
1651.9	1857.7	1810.6	1827.9		

Parameter	Units
Ammonia	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
FIELD PARAMETERS	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 02					
STRONG CK AT TR 272					
RM 2.96 U05K12					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
0.066	0.052	<0.050	<0.050	<0.050	
96.3	39.1	48.6	31.0	125	
<20	<20	<20	<20	33	
9.18	7.96	3.14	0.53	<0.10	
0.052	0.028	<0.020	<0.020	<0.020	
0.055	0.031	0.066	0.046	0.064	
1050	958	1150	1820	1720	
0.63	0.60	0.44	0.52	0.76	
654	638	870	1610	1270	
13	19	22	13	11	
14.83	17.29	17.71	17.8	19.42	
7.72	7.92	7.83	7.77	7.82	
9.2	8.14	8	8.49	5.87	
91.2	84.9	84.3	89.8	64.2	
827.2	818.8	987.8	1546.2	1525	
1026.7	960.3	1147.5	1792.5	1706.8	

HUC12: 20410001102 02					
STRONG CK AT TR 268					
RM 2.02 U05K11					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
0.149	0.392	0.980	3.69	4.04	
52.6	40.8	50.0	148	144	
<20	<20	<20	25	26	
8.86	7.42	2.39	0.37	0.21	
0.066	0.053	0.044	0.035	0.029	
0.078	0.112	0.222	0.494	0.753	
927	1040	1310	2760	2860	
0.84	0.97	1.69	4.62	4.86	
598	702	1030	2490	2540	
23	9	73	71	52	
15.05	17.31	18.13	17.12	17.33	
7.64	7.86	7.86	7.39	7.38	
8.7	7.91	7	7.1	5.45	
86.6	82.7	74.5	74.2	57.3	
730.9	888.7	1131.9	2274.9	2416.5	
902.5	1041.7	1302.8	2677.6	2831	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
BOD20	mg/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 03					
PICKEREL CK AT REINICKE RD (TR 233)					
RM 6.26 U05K10					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
0.081	<0.050	0.824	1.62	0.190	
43.5	57.7	68.9	66.8	69.5	
<20	<20	<20	20	22	
8.00	5.11	4.51	<0.10	0.13	
0.067	0.021	0.124	0.045	0.032	
0.033	0.014	0.087	0.095	0.047	
806	983	1070	1690	1400	
0.51	0.85	2.04	2.69	1.07	
518	658	748	1490	1110	
<5	<5	6	<5	5	
15.25	16.84	17.59	18.13	20.03	
7.92	8	7.91	7.51	7.64	
10.05	9.68	7.54	6.21	4.95	
100.5	100.1	79.2	66.1	54.6	
639	838.1	911.8	1461.7	1253.5	
785.2	992.8	1062.2	1682.6	1384.9	

HUC12: 20410001102 03					
PICKEREL CK AT TR 247					
RM 3.35 U05S04					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
1270	1270	1270	1270	1270	
0.095	0.095	0.095	0.095	0.095	
<2.0	<2.0	<2.0	<2.0	<2.0	
45	45	45	45	45	
3.5	3.5	3.5	3.5	3.5	
<0.20	<0.20	<0.20	<0.20	<0.20	
230	230	230	230	230	
62.7	62.7	62.7	62.7	62.7	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	<20	<20	<20	
4.6	4.6	4.6	4.6	4.6	
727	727	727	727	727	
2010	2010	2010	2010	2010	
<2.0	<2.0	<2.0	<2.0	<2.0	
37	37	37	37	37	
56	56	56	56	56	
<0.20	<0.20	<0.20	<0.20	<0.20	
6.3	6.3	6.3	6.3	6.3	
7.81	7.81	7.81	7.81	7.81	
0.054	0.054	0.054	0.054	0.054	
0.072	0.072	0.072	0.072	0.072	
0.109	0.109	0.109	0.109	0.109	
4	4	4	4	4	
<2.0	<2.0	<2.0	<2.0	<2.0	
36	36	36	36	36	
1410	1410	1410	1410	1410	
7580	7580	7580	7580	7580	
0.61	0.61	0.61	0.61	0.61	
1050	1050	1050	1050	1050	
50	50	50	50	50	
13	13	13	13	13	
14.36	14.36	14.36	14.36	14.36	
7.56	7.56	7.56	7.56	7.56	
9.06	9.06	9.06	9.06	9.06	
89	89	89	89	89	
1091.9	1091.9	1091.9	1091.9	1091.9	
1370.2	1370.2	1370.2	1370.2	1370.2	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 04					
RACCOON CK AT LIMERICK RD					
RM 13.26					
U05S01					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
<200	<200	222	505	227	
0.066	0.250	<0.050	0.196	<0.050	
<2.0	<2.0	<2.0	2.8	2.8	
45	64	57	74	68	
<0.20	<0.20	<0.20	<0.20	<0.20	
78	104	87	111	112	
34.6	46.2	45.2	65.0	69.2	
<2.0	<2.0	<2.0	<2.0	<2.0	
<20	<20	<20	<20	21	
2.9	2.7	3.8	3.3	2.7	
269	350	295	376	370	
273	347	456	1020	348	
<2.0	<2.0	<2.0	<2.0	<2.0	
18	22	19	24	22	
28	40	27	125	199	
<0.20		<0.20	<0.20	<0.20	
2.8	3.0	3.4	4.3	3.7	
5.43	1.34	2.62	0.26	0.23	
0.065	<0.020	<0.020	<0.020	<0.020	
0.045	0.081	0.082	0.129	0.105	
4	5	5	6	6	
<2.0	<2.0	<2.0	<2.0	<2.0	
17	27	25	38	43	
602	750	683	859	926	
1130	3530	1760	4290	4780	
0.88	0.84	0.52	1.29	0.53	
418	476	448	550	616	
<5	7	15	36	11	
<10	11	<10	<10	<10	
15.53	18.15	18.58	18.9	20.34	
7.8	7.95	7.79	7.96	7.89	
9.52	8.57	9.29	9.11	7.81	
95.6	91	99.5	98.2	86.7	
485.1	657.9	604.4	755.4	835.8	
592.1	756.9	688.9	855.1	917.5	

HUC12: 20410001102 04					
RACCOON CREEK AT US 20					
RM 11.32					
U05P04					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
259	<200	330	226	<200	
0.089	0.153	0.093	0.592	0.136	
2.0	3.0	3.4	6.0	5.5	
53	62	54	73	67	
<0.20	<0.20	<0.20	<0.20	<0.20	
81	93	76	104	96	
72.7	132	95.7	205	210	
<2.0	<2.0	<2.0	5.9	<2.0	
21	<20	20	24	<20	
3.7	3.8	6.2	11.7	5.4	
276	310	260	338	318	
728	478	720	604	330	
<2.0	<2.0	<2.0	<2.0	<2.0	
18	19	17	19	19	
70	116	75	137	111	
<0.20		<0.20	<0.20	<0.20	
3.7	3.9	4.0	4.1	3.9	
2.93	1.70	3.29	1.88	1.05	
0.054	0.044	0.020	0.079	0.044	
0.062	0.091	0.132	0.415	0.154	
5	5	6	11	7	
<2.0	2.6	<2.0	7.2	4.4	
43	78	56	117	120	
726	1030	791	1250	1250	
1140	1560	1220	1390	1590	
1.01	0.85	0.74	1.88	1.15	
444	570	492	726	744	
12	15	17	14	6	
16	10	<10	23	12	
15.5	18.47	20.79	20.68	21.7	
7.92	8.17	8.32	8.23	8.2	
9.85	9.87	10.51	9.31	9.49	
99	105.6	117.6	104.2	108.3	
582.6	884.8	708.1	1137.1	1155.5	
711.6	1010.9	770	1239.4	1233.1	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
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Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 04					
RACCOON CK DST CLYDE WWTP OUTFALL 001 (MIX ZONE)					
RM 11.01 U05W33					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
<200	<200	282	<200	<200	
0.238	0.100	0.144	0.403	0.230	
<2.0	<2.0	2.3	2.6	2.9	
35	32	27	20	17	
<0.20	<0.20	<0.20	<0.20	<0.20	
79	82	72	71	65	
114	137	147	157	138	
<2.0	<2.0	<2.0	<2.0	<2.0	
27	30	29	36	36	
4.7	4.9	6.1	6.6	6.6	
255	258	233	223	208	
292	193	339	184	158	
<2.0	<2.0	<2.0	<2.0	<2.0	
14	13	13	11	11	
28	23	18	18	15	
<0.20		<0.20	<0.20	<0.20	
7.4	10.6	10.1	14.3	14.0	
7.95	9.95	11.4	12.1	13.0	
0.123	0.109	0.099	0.119	0.092	
0.077	0.091	0.415	1.07	0.901	
17	26	21	33	29	
<2.0	<2.0	<2.0	<2.0	<2.0	
120	183	171	228	191	
1110	1430	1300	1510	1420	
877	886	824	726	709	
1.54	1.26	1.04	1.82	1.41	
662	898	798	944	902	
9	5	15	6	7	
25	23	28	48	33	
17.97	22.24	23.15	24.36	24.54	
7.73	8.08	8.15	7.5	7.74	
9.58	9.51	8.09	5.37	7.4	
101.4	109.7	94.9	64.5	89.2	
943.5	1363.7	1242.1	1491.7	1391.5	
1089.8	1439.7	1287.5	1510.3	1403.7	

HUC12: 20410001102 04					
RACCOON CK AT N END OF LANDFILL, 0.2 MI DST CLYDE WWTP					
RM 10.80 U05W08					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
<200	<200	311		<200	
0.221	0.114	0.129		0.200	
<2.0	<2.0	2.3		3.1	
38	34	28		19	
<0.20	<0.20	<0.20		<0.20	
79	83	70		65	
110	137	147		139	
<2.0	<2.0	<2.0		<2.0	
26	24	28		29	
4.7	5.0	5.9		6.5	
259	261	228		208	
311	297	501		169	
<2.0	<2.0	<2.0		<2.0	
15	13	13		11	
33	33	32		18	
<0.20		<0.20		<0.20	
7.3	10.5	9.8		14.4	
7.31	9.90	11.9		14.2	
0.119	0.102	0.089		0.092	
0.076	0.137	0.352		0.931	
16	26	20		28	
<2.0	<2.0	<2.0		<2.0	
114	182	162		189	
1070	1420	1290		1430	
929	909	810		730	
1.58	1.28	1.03		1.45	
652	890	802		900	
7	10	12		<5	
23	25	23		24	
17.74	22.06	23.85		24.41	
7.66	8.05	8.09		7.76	
8.94	9.07	7.64		7.08	
94.3	104.2	90.8		85	
903	1347.6	1249.9		1394.3	
1048.4	1427.7	1277.9		1410.1	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
BOD20	mg/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 04					
RACCOON CK AT TR 223					
RM 10.18					
U05W10					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
<200	<200	<200	<200	<200	
0.190	0.106	0.087	0.117	<0.050	
<2.0	2.0	2.4	2.6	2.9	
41	37	33	25	21	
<0.20	<0.20	<0.20	<0.20	<0.20	
81	83	72	68	66	
103	135	138	153	138	
<2.0	<2.0	<2.0	<2.0	<2.0	
23	29	28	36	26	
4.7	4.8	5.1	5.8	5.9	
268	265	233	215	210	
265	159	185	142	114	
<2.0	<2.0	<2.0	<2.0	<2.0	
16	14	13	11	11	
36	25	17	23	16	
<0.20		<0.20	<0.20	<0.20	
6.5	10.0	8.9	14.1	13.1	
7.93	9.21	11.2	14.1	12.0	
0.124	0.098	0.065	0.115	0.051	
0.108	0.126	0.266	0.849	0.893	
15	25	19	31	28	
<2.0	<2.0	<2.0	<2.0	<2.0	
105	173	150	216	183	
1010	1390	1220	1480	1420	
999	942	871	711	754	
1.48	1.39	0.88	1.60	1.23	
608	838	758	934	910	
<5	<5	7	<5	<5	
25	22	19	32	23	
17.15	20.34	20.89	21.58	22.67	
5.86	7.99	8.02	7.76	7.95	
8.98	8.85	8.63	7.38	7.58	
93.5	98.4	96.9	84	88.2	
843.7	1276.2	1120	1373.8	1339.6	
992.6	1401	1215.4	1469.8	1402.1	

HUC12: 20410001102 04					
RACCOON CREEK DST OHIO TURNPIKE AT TR 244					
RM 5.45					
U05W17					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
355	<200	<200	<200	217	
0.130	0.054	<0.050	<0.050	<0.050	
<2.0	<2.0	<2.0	<2.0	2.5	
46	46	44	40	38	
5.3	3.7	3.7	<3.0	3.5	
<0.20	<0.20	<0.20	<0.20	<0.20	
156	239	234	305	244	
80.2	92.9	98.2	103	100	
<2.0	<2.0	<2.0	<2.0	<2.0	
190	<20	<20	23	21	
3.8	3.0	3.6	3.6	3.3	
513	745	728	910	749	
611	151	230	117	347	
<2.0	<2.0	<2.0	<2.0	<2.0	
30	36	35	36	34	
43	24	25	26	39	
<0.20	<0.20	<0.20	<0.20	<0.20	
6.4	7.6	8.5	9.2	8.9	
5.44	4.22	5.33	5.07	4.21	
0.113	0.024	<0.020	<0.020	<0.020	
0.048	0.035	0.127	0.060	0.271	
0.078	0.035	0.147	0.089	0.323	
9	15	14	23	19	
<2.0	<2.0	<2.0	<2.0	<2.0	
69	101	103	118	119	
1230	1710	1670	1880	1810	
3240	6230	6020	8670	9190	
1.02	1.05	1.01	1.12	2.54	
822	1270	1270	1420	1390	
13	<5	8	<5	7	
12	<10	<10	14	10	
15.95	17.52	18.09	18.04	19.32	
7.78	7.87	7.98	7.86	7.93	
8.83	8.64	9.37	8.58	8.05	
89.7	90.8	99.6	91.2	87.8	
991.1	1467.5	1428.3	1623.2	1591.2	
1198.1	1712.1	1645.4	1872	1784.8	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 04				
BUCK CK AT TR 223				
RM 0.20				
U05S03				
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009
<200	<200	<200		<200
0.057	<0.050	0.063		<0.050
<2.0	<2.0	<2.0		<2.0
40	42	45		36
<0.20	<0.20	<0.20		<0.20
124	184	214		504
49.9	57.1	56.9		64.7
<2.0	<2.0	<2.0		<2.0
<20	<20	<20		<20
<2.0	<2.0	2.0		<2.0
404	575	650		1430
151	271	219		160
<2.0	<2.0	<2.0		<2.0
23	28	28		41
30	41	42		50
<0.20		<0.20		<0.20
2.9	3.7	4.2		5.5
6.29	2.47	1.94		<0.10
0.077	<0.020	<0.020		<0.020
0.055	0.049	0.064		0.031
3	3	3		3
<2.0	<2.0	<2.0		<2.0
25	31	31		39
866	1150	1220		2070
1950	4470	5440		19100
0.97	0.68	0.56		0.53
574	804	912		1830
<5	7	11		<5
<10	<10	<10		<10
15.06	17.49	18.32		22.17
7.97	8.15	8.06		8.2
10.38	11.64	10.37		13.33
103.3	122	110.6		153.8
686.2	989.9	1052.5		1922.8
847.1	1155.7	1206.4		2032.5



DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Ammonia	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001102 05					
SOUTH CK AT CR 229					
RM 7.92					
U05G01					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
0.075	0.120	0.123	0.139	0.199	
35.7	47.8	42.9	50.7	56.9	
<20	<20	<20	<20	20	
6.55	3.30	3.09	0.53	0.27	
0.080	0.039	<0.020	<0.020	<0.020	
0.053	0.069	0.110	0.101	0.123	
664	755	795	987	1040	
0.52	0.64	0.80	0.87	0.86	
420	468	530	710	740	
5	12	<5	5	<5	
15.8	18.51	20.43	19.71	21.02	
7.95	8.07	8.17	7.81	7.89	
9.94	9.31	10.25	11.44	7.93	
100.5	99.6	113.9	125.4	89.3	
537.7	630	736	902.5	974.4	
652.3	719.1	806.4	1004	1054.6	

HUC12: 20410001102 05					
SOUTH CK AT WHITMORE RD (TR 247)					
RM 4.04					
U05K05					
6/2/2009	6/16/2009	7/7/2009	7/21/2009	8/4/2009	
0.065	0.055	<0.050	<0.050	<0.050	
48.4	42.4	40.6	52.5	47.9	
<20	<20	<20	<20	21	
7.37	3.09	2.44	<0.10	0.35	
0.054	<0.020	<0.020	<0.020	<0.020	
0.085	0.100	0.080	0.032	0.076	
738	965	974	1320	1110	
0.48	0.64	0.51	0.68	0.71	
466	648	686	1050	874	
34	21	23	16	20	
15.21	18.37	19.21	20.31	20.75	
7.67	7.94	8.14	8.06	8.05	
9.5	7.8	8.77	9.65	7.79	
94.8	83.2	95.2	107.2	87.3	
587.3	845.3	862.3	1192.5	1012.8	
722.3	967.8	969.6	1309.7	1102.3	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Ammonia	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
FIELD PARAMETERS	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 0410001112 01				
WESTERHOUSE DITCH AT SNAVELY RD				
RM 3.25				
U04K05				
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009
0.077	<0.050	<0.050	<0.050	<0.050
24.4	36.3	26.8	38.3	38.1
<20	<20	<20	<20	<20
7.50	4.78	6.34	4.29	3.49
0.055	0.023	<0.020	0.025	0.039
0.104	0.057	0.047	0.074	0.029
600	700	663	697	702
0.30	0.38	0.50	0.41	0.27
362	406	426	418	440
9	5	8	11	8
13.26	16.24	14.79	17.43	17.78
7.84	7.75	7.9	7.66	7.61
9.4	7.87	8.95	9.82	5.01
89.9	80.3	88.5	102.7	52.8
438.4	580.4	527.5	587.8	601.1
565.1	697.1	655.2	687.1	697.1

HUC12: 0410001112 01				
ALBRIGHT DITCH AT SR 228				
RM 0.59				
U04K06				
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009
0.068	0.082	<0.050	<0.050	0.086
20.6	21.9	18.7	26.6	33.3
<20	<20	<20	<20	20
4.40	1.18	1.50	0.24	0.31
0.080	0.070	<0.020	<0.020	<0.020
0.045	0.049	0.143	0.049	0.073
658	617	616	586	678
0.38	0.46	2.05	0.52	0.45
390	380	396	370	476
7	37	15	25	26
14.51	18.81	16.62	18.69	19.24
8.24	8.05	8.23	8.13	8.05
9.66	7.92	9.55	9.59	6.11
94.9	85.2	98.2	102.9	66.4
493.4	537.8	514.2	503.3	600.4
617.1	609.9	612.2	572.2	674.7

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
BOD20	mg/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001112 02				
BEAVER CK DST LEAFY OAKS MHP				
RM 4.00				
U04K03				
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009
<0.050	<0.050	<0.050	<0.050	<0.050
26.3	28.3	27.6	29.5	31.7
<20	<20	<20	<20	26
6.34	2.05	2.37	0.76	0.55
0.058	<0.020	<0.020	<0.020	<0.020
0.058	0.060	0.065	0.035	0.039
691	716	707	734	726
1.62	0.36	0.43	0.38	0.37
422	472	454	476	578
18	14	13	6	8
14.67	18.31	17.21	18.9	19.81
8.21	8.03	8.12	8.04	8.11
9.68	7.69	9.31	10.13	6.95
95.5	81.9	97	109.2	76.3
521.9	622.5	596.9	625.2	648
650.2	713.7	701.2	707.6	719.3

HUC12: 20410001112 02				
BEAVER CK AT SR 101				
RM 3.48				
U04G25				
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009
853	443	541	365	509
0.335	0.062	0.061	<0.050	<0.050
<2.0	<2.0	<2.0	2.0	2.5
65	66	68	62	63
6.6	3.4	<3.0	6.7	3.8
<0.20	<0.20	<0.20	<0.20	<0.20
88	95	91	84	79
24.9	31.5	26.5	29.7	32.2
<2.0	<2.0	<2.0	<2.0	<2.0
24	<20	<20	<20	<20
2.2	<2.0	<2.0	<2.0	<2.0
327	381	355	342	313
1450	615	828	504	724
<2.0	<2.0	<2.0	<2.0	<2.0
26	35	31	32	28
147	69	65	85	192
<0.20	<0.20	<0.20	<0.20	<0.20
4.0	3.6	3.4	2.8	3.1
10.0	2.16	3.33	0.19	0.35
0.205	<0.020	0.021	<0.020	<0.020
0.020	0.026	0.058	<0.010	0.021
0.056	0.041	0.071	0.042	0.047
3	3	4	4	4
<2.0	<2.0	<2.0	<2.0	<2.0
9	14	11	12	15
674	727	688	676	647
214	215	199	189	205
0.80	0.40	0.62	0.50	0.69
396	448	446	462	460
34	20	22	12	14
<10	11	<10	<10	<10
14.97	19.26	19.44	19.98	21.97
7.89	8.07	8.15	8.27	8.03
7.45	8	8.25	10.03	6.81
74	86.8	89.9	110.5	78
507.4	645.6	611.4	597.9	611.2
627.6	725.1	684.1	661.3	648.8

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001112 02					
EMERSON CK (ROYER DITCH) AT CR 46					
RM 10.12					
U04K08					
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009	
614					
0.514					
<2.0					
62					
<0.20					
101					
81.6					
<2.0					
36					
3.5					
396					
926					
<2.0					
35					
268					
<0.20					
4.6					
15.0					
0.488					
0.072					
6					
<2.0					
50					
973					
469					
1.61					
660					
9					
19					
14.14					
7.56					
6.24					
60.9					
725.5					
915.4					

HUC12: 20410001112 02					
EMERSON CK AT TR 179					
RM 1.83					
U04G26					
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009	
				270	
0.073	0.062	<0.050	<0.050	<0.050	
				2.9	
				56	
				<0.20	
				98	
36.2	38.6	33.9	36.1	37.9	
				<2.0	
20	20	<20	<20	21	
				<2.0	
				385	
				398	
				<2.0	
				34	
				444	
				<0.20	
				3.4	
6.37	0.24	1.17	<0.10	0.13	
0.080	<0.020	<0.020	<0.020	<0.020	
0.080	0.070	0.116	0.056	0.090	
				5	
				<2.0	
				22	
709	791	733	692	769	
				439	
0.66	0.48	0.59	0.55	0.54	
440	494	488	478	524	
6	12	35	36	10	
				<10	
14.03	17.82	16.72	18.18	18.77	
7.9	7.91	7.98	7.74	7.75	
8.05	7.94	9.07	10.28	3.37	
78.3	83.7	93.5	109.2	36.2	
526.7	677	608.9	575.8	681.3	
666.3	784.6	723.3	661.9	773.4	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Ammonia	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 0410001112 03					
GREEN CK AT CR 34					
RM 18.80					
U04G24					
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009	
0.101	0.050	<0.050	<0.050	<0.050	
21.3	18.7	17.4	16.1	16.0	
<20	<20	<20	<20	<20	
4.45	0.29	0.47	<0.10	0.11	
0.095	<0.020	<0.020	<0.020	<0.020	
0.028	<0.010	0.012	<0.010	<0.010	
1930	2240	2280	2480	2500	
0.43	0.58	0.49	0.44	0.32	
1710	2060	2200	2290	2400	
8	<5	<5	<5	<5	
13.21	15.48	14.86	14.71	15.44	
7.92	7.8	7.92	7.79	7.87	
9.96	10.05	11.67	18.71	9.92	
95.5	101.4	116.2	185.8	100.1	
1414.2	1835.8	1831.3	1899	2002.5	
1825.3	2243.6	2271.3	2363.6	2449.6	

HUC12: 0410001112 03					
GREEN CK AT CR 213 (DEWEY RD)					
RM 12.85					
U04S10					
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009	
0.075	0.077	<0.050	<0.050	<0.050	
22.0	20.4	18.2	16.3	16.0	
<20	<20	<20	<20	<20	
4.35	0.94	0.67	0.22	0.15	
0.063	0.029	<0.020	<0.020	<0.020	
0.055	0.051	0.045	0.040	0.019	
1720	2150	2220	2480	2490	
1.00	0.41	0.56	0.44	0.27	
1460	1940	2130	2300	2380	
28	19	13	9	13	
14.15	17.36	16.88	17.46	18.17	
8.15	7.98	8.1	8	8.02	
9.78	9.23	10.48	13.95	9.13	
95.7	96.8	108.9	146.7	97.4	
1292.5	1835.1	1864.1	2023.3	2111.7	
1630.3	2148.6	2206.3	2363.5	2428.8	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Sandusky Bay tributaries study area, 2009.

Parameter	Units
Ammonia	mg/L
BOD20	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001113 01				
MUSKELLUNGE CK AT FANGBONER RD				
RM 1.23				
U04P08				
6/9/2009	6/23/2009	7/14/2009	7/29/2009	8/11/2009
<0.050	<0.050	<0.050	<0.050	<0.050
47.5	28.8	60.0	62.3	71.4
<20	<20	<20	<20	<20
3.47	9.66	0.23	0.11	0.13
0.029	0.047	<0.020	<0.020	<0.020
0.048	0.171	0.063	0.080	0.105
733	666	723	737	889
0.60	0.78	0.56	0.26	0.36
456	426	504	482	570
10	16	7	11	10
20.3	20.64	19.89	21.42	23.64
8.05	8.07	7.91	7.83	7.78
7.02	8.08	8.15	4.9	4.23
77.8	90.1	89.6	55.6	50
666	598.6	641.7	680	866.3
731.7	653	711.1	729.9	889.5

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
BOD20	mg/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001113 02				
SANDUSKY R JUST UPST BALLVILLE DAM				
RM 18.05				
U04T02				
6/4/2009	6/18/2009	7/9/2009	7/23/2009	8/6/2009
4080	1050	272	1090	1140
0.082	<0.050	<0.050	0.157	<0.050
2.9	<2.0	<2.0	3.3	3.1
71	61	42	71	82
<0.20	<0.20	<0.20	<0.20	<0.20
68	85	56	69	85
27.1	40.2	32.9	49.1	55.6
4.0	<2.0	<2.0	<2.0	<2.0
<20	21	<20	22	21
5.3	2.8	2.4	4.6	2.9
256	344	235	312	365
6010	1570	404	1690	1970
4.4	<2.0	<2.0	<2.0	<2.0
21	32	23	34	37
98	56	31	176	174
<0.20	<0.20	<0.20	<0.20	<0.20
6.9	3.6	2.4	4.9	4.9
8.39	3.41	3.18	<0.10	<0.10
0.072	0.022	0.028	<0.020	<0.020
0.140	0.118	0.033	0.116	0.079
5	4	4	4	5
<2.0	<2.0	<2.0	<2.0	<2.0
13	23	19	31	33
562	722	567	725	824
1460	2890	2260	3740	4490
0.86	1.60	0.55	0.90	0.38
380	456	364	468	630
104	35	16	32	65
20	10	<10	10	<10
16.32	23.17	23.76	23.14	25.5
8.36	8.48	8.59	7.97	8.27
8.72	10.41	14.72	5.82	7.9
89.1	121.9	174.3	68.2	96.7
459.4	670.9	542.8	676.7	828
550.8	695.2	556	701.7	820.2

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001113 02					
SANDUSKY R AT TIFFIN RD					
RM 17.7					
U04S23					
6/4/2009	6/18/2009	7/9/2009	7/23/2009	8/6/2009	
4450	770	359	1600	523	
0.089	<0.050	<0.050	0.176	<0.050	
3.0	<2.0	<2.0	3.9	3.1	
73	58	46	69	72	
<0.20	<0.20	<0.20	<0.20	<0.20	
69	83	60	66	77	
27.1	41.0	33.3	48.9	56.4	
4.3	<2.0	<2.0	2.4	<2.0	
21	<20	20	26	<20	
5.5	2.6	2.5	3.9	2.1	
263	335	245	297	341	
6490	1150	559	2390	849	
4.7	<2.0	<2.0	2.0	<2.0	
22	31	23	32	36	
115	54	43	154	128	
<0.20	<0.20	<0.20	<0.20	<0.20	
7.2	3.4	2.7	4.7	3.7	
8.36	3.57	3.87	<0.10	<0.10	
0.068	0.021	0.028	<0.020	<0.020	
0.151	0.055	0.033	0.114	0.069	
5	4	4	4	4	
<2.0	<2.0	<2.0	<2.0	<2.0	
13	23	19	29	34	
564	717	580	697	814	
1490	2870	2340	3500	4540	
0.94	0.98	0.67	0.84	0.59	
388	448	378	470	626	
140	36	19	42	29	
20	<10	<10	15	<10	
16.4	22.93	23.34	22.94	24.8	
8.44	8.55	8.65	8.13	8.49	
9.74	9.58	8.96	8.02	9.05	
99.7	111.7	105.3	93.6	109.3	
461.3	655.1	552.9	649.3	804	
552	682.1	571	675.8	807.1	

HUC12: 20410001113 02					
SANDUSKY R AT STATE ST					
RM 15.40					
U04W11					
6/4/2009	6/18/2009	7/9/2009	7/23/2009	8/6/2009	
4240	827	382	752	509	
0.089	<0.050	<0.050		<0.050	
2.8	<2.0	<2.0	3.0	3.0	
72	56	49	60	73	
<0.20	<0.20	<0.20	<0.20	<0.20	
70	81	64	61	75	
27.1	40.2	33.9	46.4	54.8	
3.9	<2.0	<2.0	<2.0	<2.0	
29	<20	<20	22	<20	
5.3	2.7	3.3	3.1	2.0	
265	326	259	276	331	
6220	1220	576	1140	883	
4.3	<2.0	<2.0	<2.0	<2.0	
22	30	24	30	35	
111	57	44	101	109	
<0.20	<0.20	<0.20	<0.20	<0.20	
7.1	3.3	3.0	3.7	3.7	
8.93	3.69	3.98	0.13	<0.10	
0.078	0.021	<0.020	<0.020	<0.020	
0.157	0.048	0.028	0.095	0.105	
5	4	4	4	4	
<2.0	<2.0	<2.0	<2.0	<2.0	
13	22	19	27	32	
572	707	611	665	796	
1520	2700	2440	3260	4090	
1.06	1.01	0.53	0.74	0.61	
382	446	390	460	618	
115	37	23	25	28	
23	<10	<10	<10	25	
16.69	22.56	23.63	21.9	24	
8.42	8.49	8.42	7.98	8.14	
9.26	9.07	8.19	6.8	6.41	
95.4	105	96.7	77.7	76.3	
469	646	579.4	602.5	775.4	
557.6	677.6	595	640.5	790.6	



DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Ammonia	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
FIELD PARAMETERS	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001113 03				
SANDUSKY R UPST WIGHTMANS GROVE				
RM 4.70				
U04S17				
6/4/2009	6/18/2009	7/9/2009	7/23/2009	8/6/2009
0.325	0.166	<0.050	0.091	<0.050
30.1	36.4	28.1	34.2	52.4
25	<20	20	20	21
9.75	6.84	6.56	2.14	0.39
0.216	0.135	0.085	0.055	0.030
0.133	0.074	0.076	0.125	0.075
560	623	540	594	643
1.27	1.35	0.81	1.38	0.49
386	402	342	410	458
42	25	33	36	36
18.37	23.15	24.84	23.6	24.77
8	8.11	8.7	8	8.16
4.9	6.61	10.8	6.43	8.17
52.2	77.4	130.5	75.9	98.7
478.8	579.6	527.4	562	637.6
548.2	600.8	529	577.4	640.5

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001113 03				
BARK CK AT KELLEY RD (CR 245)				
RM 3.20				
300671				
6/4/2009	6/18/2009	7/9/2009	7/23/2009	8/6/2009
350	2160	409	2420	580
<0.050	0.348	<0.050	<0.050	<0.050
<2.0	2.3	<2.0	2.7	2.6
55	63	63	69	89
<0.20	<0.20	<0.20	<0.20	<0.20
99	50	80	57	69
57.3	46.1	66.1	48.4	100
<2.0	3.4	<2.0	3.2	<2.0
<20	<20	<20	22	<20
<2.0	4.9	2.5	6.3	3.0
350	187	299	212	275
610	3710	679	4160	1010
<2.0	4.6	<2.0	3.0	<2.0
25	15	24	17	25
32	98	39	155	89
<0.20	<0.20	<0.20	<0.20	<0.20
2.8	4.9	3.2	6.2	3.6
6.20	1.75	1.70	0.31	0.14
0.044	0.048	<0.020		<0.020
0.020	0.096	0.028	0.215	0.027
2	3	2	3	3
<2.0	<2.0	<2.0	<2.0	<2.0
29	25	35	28	57
775	463	754	517	786
970	901	1130	1550	1870
0.66	1.13	0.72	0.77	0.44
476	286	446	344	496
15	81	17	116	35
<10	27	<10	25	<10
14.36	21.3	22.65	19.5	22.5
8.39	7.84	8.17	7.71	8.09
11.08	6.97	9.33	7.76	9.92
108.6	78.8	108.2	84.6	114.8
605.4	417.6	714.9	447.6	747.1
759.9	449.4	748.4	500.1	784.5

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Ammonia	mg/L
Chloride	mg/L
COD	mg/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Spec Cond (Lab)	umhos/cm
TKN	mg/L
TDS	mg/L
TSS	mg/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001114 03					
LITTLE MUDDY CK AT KLINE RD					
RM 2.50 300676					
6/9/2009	6/23/2009	7/14/2009	7/29/2009	8/11/2009	
<0.050	0.090	0.128	<0.050	<0.050	
46.1	5.3	51.3	41.4	45.8	
<20	23	22	20	31	
5.36	8.72	3.50	<0.10	<0.10	
0.102	0.095	0.152	<0.020	<0.020	
0.070	0.082	0.099	0.172	0.204	
786	674	663	661	687	
0.71	1.03	1.15	0.58	0.72	
500	432	458	408	434	
31	25	26	36	35	
22.56	25.48	22.22	23.96	27.49	
7.95	7.9	7.76	7.64	7.81	
7.36	6.21	7.83	4.69	5.24	
85.3	76	90.1	55.7	66.5	
744.5	676.6	590.8	641.3	725.8	
780.9	670.5	623.9	654.2	692.8	

HUC12: 20410001114 03					
FISHING CK AT WEICKERT RD					
RM 0.20 300678					
6/9/2009	6/23/2009	7/14/2009	7/29/2009	8/11/2009	
0.150	0.150	0.174	<0.050	<0.050	
46.5	34.2	47.1	48.3	55.8	
<20	<20	<20	<20	30	
2.52	8.00	1.96	<0.10	<0.10	
0.090	0.120	0.068	<0.020	<0.020	
0.084	0.069	0.121	0.150	0.229	
790	744	621	675	700	
0.74	0.79	1.09	0.50	0.75	
504	478	408	416	454	
50	38	33	35	16	
21.68	24.62	20.78	23.08	25.8	
7.8	7.81	7.67	7.49	7.47	
6.04	5.95	7.71	4.48	3.67	
68.8	71.6	86.3	52.3	45.1	
740.4	730.2	606.1	645.1		
790.6	735.6	659.2	669.7	700.8	

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 20410001114 04				
MUDDY CK AT EAST SIDE OF SR 53				
U04Q13				
6/4/2009	6/18/2009	7/9/2009	7/23/2009	8/6/2009
2600	1820	1460	1920	1990
0.572	0.185	<0.050	<0.050	<0.050
2.3	2.7	2.6	7.3	7.0
70	68	52	58	74
<0.20	<0.20	<0.20	<0.20	<0.20
65	61	46	54	68
25.6	39.1	24.9	29.2	35.9
2.8	2.2	<2.0	2.1	2.2
22	25	21	48	41
4.1	3.3	3.2	3.8	3.0
257	259	197	221	273
3530	2570	2090	2570	3160
2.7	2.1	<2.0	2.2	2.8
23	26	20	21	25
78	116	85	124	186
<0.20	<0.20	<0.20	<0.20	<0.20
5.2	4.6	3.9	4.4	5.0
5.71	0.61	0.16	<0.10	<0.10
0.146	0.041	<0.020	<0.020	<0.020
0.075	0.138	0.106	0.273	0.399
5	6	5	5	5
<2.0	<2.0	<2.0	<2.0	<2.0
12	17	12	14	16
537	586	432	494	572
1880	2160	1540	1790	2120
1.53	1.29	1.31	1.68	0.70
362	406	300	356	416
87	84	85	83	105
14	10	<10	15	10
18.5	22.76	24.88	22.57	24.03
8.2	7.76	8.67	8.03	8.05
6.75	4.61	10.52	4.58	5.54
72.1	53.6	127.2	53	66
461.8	548.9	426.2	456.7	560.1
527.3	573.3	427.2	479	570.7

## **Appendix C – Organic Water Chemistry Results**

Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

\*Note: USEPA Method 525.2 is an approved method for the determination of organic compounds in drinking water (including source water), but is not approved for surface water unless it is a drinking water source (PWS use). Although Ohio EPA-DSW utilizes Method 525.2 mostly for the detection of herbicides that are not found using approved surface water methods, not all compounds detected (e.g. bis(2-Ethylhexyl)phthalate) are herbicides, but all analytes reported are reliably recovered using Method 525.2. At any site not designated as a drinking water source (PWS), the results of any compounds detected using Method 525.2 are a good indication of the presence and concentration of the compound, and are used for informational purposes only.

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch near Reservoirs at RR
River Mile	RM 2.32	RM 1.35	RM 2.32
STORET ID	U05K15	U05P05	U05K13
Date Sampled	6/1/2009	6/1/2009	6/1/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*			
Acetochlor	0.34	0.35	0.32
Alachlor	<0.21	<0.21	<0.21
Atrazine	0.51	4.66	0.79
Benzo[a]pyrene	<0.52	<0.53	<0.53
bis(2-Ethylhexyl)adipate	<0.52	<0.53	<0.53
bis(2-Ethylhexyl)phthalate	0.63 B	0.92 B	0.56 B
Butachlor	<0.21	<0.21	<0.21
Metolachlor	<0.21	1.03	<0.21
Metribuzin	<0.21	<0.21	<0.21
Pentachlorophenol	<5.15	<5.26	<5.26
Propachlor	<0.21	<0.21	<0.21
Simazine	0.23	0.22	0.28

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch near Reservoirs at RR
River Mile	RM 2.32	RM 1.35	RM 2.32
STORET ID	U05K15	U05P05	U05K13
Date Sampled	6/15/2009	6/15/2009	6/15/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*			
Acetochlor	<0.22	0.24	<0.21
Alachlor	<0.22	<0.22	<0.21
Atrazine	0.49	0.62	<0.21
Benzo[a]pyrene	<0.54	<0.55	<0.53
bis(2-Ethylhexyl)adipate	<0.54	<0.55	<0.53
bis(2-Ethylhexyl)phthalate	<0.54	0.6	<0.53
Butachlor	<0.22	<0.22	<0.21
Metolachlor	<0.22	0.22	<0.21
Metribuzin	<0.22	<0.22	<0.21
Pentachlorophenol	<5.43	<5.49	<5.32
Propachlor	<0.22	<0.22	<0.21
Simazine	<0.22	<0.22	0.25

J – the analyte was positively identified, the associated value is estimated.

UJ – Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.

DSW/EAS 2010-4-6 Sandusky Bay Tributaries  
APPENDIX B. Surface Water results for inorganic chemistry and field parameters from the Lower Sandusky & Sandusky Bay tributaries study area, 2009.

Parameter	Units
Aluminum	ug/L
Ammonia	mg/L
Arsenic	ug/L
Barium	ug/L
BOD20	mg/L
Cadmium	ug/L
Calcium	mg/L
Chloride	mg/L
Chromium	ug/L
COD	mg/L
Copper	ug/L
Hardness, T	mg/L
Iron	ug/L
Lead	ug/L
Magnesium	mg/L
Manganese	ug/L
Mercury	ug/L
Nickel	ug/L
Nitrate+nitrite	mg/L
Nitrite	mg/L
Orthophosphate	mg/L
Phosphorus, T	mg/L
Potassium	mg/L
Selenium	ug/L
Sodium	mg/L
Spec Cond (Lab)	umhos/cm
Strontium	ug/L
TKN	mg/L
TDS	mg/L
TSS	mg/L
Zinc	ug/L
<b>FIELD PARAMETERS</b>	
Temperature	C
pH	S.U.
DO	mg/l
DO Sat	%
Conductivity	umhos/cm
Spec Conduct	umhos/cm

HUC12: 0410001112 03				
GREEN CK AT CR 229				
RM 9.08				
U04G20				
6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009
0.060	0.050	<0.050	<0.050	<0.050
23.9	23.3	19.1	17.3	15.8
<20	<20	<20	76	<20
4.68	1.21	0.76	0.16	0.10
0.055	0.027	<0.020	<0.020	<0.020
0.071	0.104	0.069	0.034	0.024
1630	2070	2170	2440	2440
0.49	0.37	0.56	0.39	0.30
1380	1870	2080	2290	2330
47	42	38	15	16
14.85	18.3	18.11	18.34	19.37
8.14	8.05	8.09	7.99	7.96
9.36	8.59	9.45	15.21	8.29
93	91.9	100.7	162.9	90.7
1243.9	1814.9	1875.5	2050.9	2142
1543.1	2081	2159.9	2350	2400.1

HUC12: 0410001112 03				
GREEN CK AT TR 239				
RM 5.06				
U04K01				
6/2/2009	7/7/2009	7/21/2009	8/4/2009	
1520	1030	540	592	571
0.072	<0.050	<0.050	<0.050	<0.050
<2.0	<2.0	<2.0	<2.0	<2.0
56	56	58	51	45
4.3	3.1	<3.0	<3.0	<3.0
<0.20	<0.20	<0.20	<0.20	<0.20
249	436	465	735	548
26.6	24.3	21.2	18.5	16.7
<2.0	<2.0	<2.0	<2.0	<2.0
<20	<20	<20	<20	53
3.4	2.3	<2.0	<2.0	<2.0
766	1290	1380	2090	1620
2500	1790	902	982	927
<2.0	<2.0	<2.0	<2.0	<2.0
35	49	52	61	62
82	93	73	88	88
<0.20	<0.20	<0.20	<0.20	<0.20
7.0	7.4	8.5	7.5	7.5
5.96	1.22	1.09	0.15	<0.10
0.073	<0.020	<0.020	<0.020	<0.020
0.040	0.042	0.028	0.012	<0.010
0.084	0.117	0.026	0.037	0.037
4	3	3	3	3
<2.0	<2.0	<2.0	<2.0	<2.0
15	15	15	15	14
1290	1960	2050	2340	2400
6500	13900	14400	24300	22100
0.63	0.88	0.38	0.41	0.49
992	1700	1950	2250	2290
71	63 PT	44	30	34
11	<10	<10	<10	<10
15.44	17.9	18.62	18.57	19.88
7.77	8.05	8.11	7.96	8
9.45	8.81	9.05	8.92	8.32
95	93.4	97.4	96	91.9
1026.5	1700.8	1788.9	2036.3	2114.9
1255.9	1967.9	2037.3	2321.3	2344.3

Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

\*Note: USEPA Method 525.2 is an approved method for the determination of organic compounds in drinking water (including source water), but is not approved for surface water unless it is a drinking water source (PWS use). Although Ohio EPA-DSW utilizes Method 525.2 mostly for the detection of herbicides that are not found using approved surface water methods, not all compounds detected (e.g. bis(2-Ethylhexyl)phthalate) are herbicides, but all analytes reported are reliably recovered using Method 525.2. At any site not designated as a drinking water source (PWS), the results of any compounds detected using Method 525.2 are a good indication of the presence and concentration of the compound, and are used for informational purposes only.

HUC	0410001101-03		
Location	Snyder's Ditch near Reservoirs at RR	Snyder's Ditch near Reservoirs at RR	Snyder's Ditch near Reservoirs at RR
River Mile	RM 2.32	RM 2.32	RM 2.32
STORET ID	U05K13	U05K13	U05K13
Date Sampled	7/6/2009	7/20/2009	8/3/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*			
Acetochlor	0.3	<0.23 UJ	<0.22
Alachlor	<0.22	<0.23	<0.22
Atrazine	0.74	0.36	<0.22
Benzo[a]pyrene	<0.54	<0.57	<0.55
bis(2-Ethylhexyl)adipate	<0.54	<0.57	<0.55
bis(2-Ethylhexyl)phthalate	<0.54	<0.57	0.65 J
Butachlor	<0.22	<0.23	<0.22
Metolachlor	<0.22	<0.23	<0.22
Metribuzin	<0.22	<0.23	<0.22
Pentachlorophenol	<5.43	<5.65	<5.49
Propachlor	<0.22	<0.23	<0.22
Simazine	0.32	0.26	<0.22

HUC	0410001102-03	
Location	Pickereel Ck at TR 247	Pickereel Ck at TR 247
River Mile	RM 3.35	RM 3.35
STORET ID	U05S04	U05S04
Date Sampled	6/2/2009	6/16/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*		
Acetochlor	0.53	<0.21
Alachlor	<0.22	<0.21
Atrazine	1.36	0.28
Benzo[a]pyrene	<0.56	<0.52
bis(2-Ethylhexyl)adipate	<0.56	<0.52
bis(2-Ethylhexyl)phthalate	0.73	<0.52
Butachlor	<0.22	<0.21
Metolachlor	0.22	<0.21
Metribuzin	<0.22	<0.21
Pentachlorophenol	<5.56	<5.21
Propachlor	<0.22	<0.21
Simazine	<0.22	<0.21

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.



Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch dst Bellevue WWTP at Knauss Rd
River Mile	RM 2.32	RM 1.35	RM 2.46
STORET ID	U05K15	U05P05	U05S09
Date Sampled	7/6/2009	7/6/2009	7/6/2009
Method 624 - Volatile Organic Compounds (ug/l)			
Benzene	<0.50	<0.50	<0.50
Bromobenzene	<0.50	<0.50	<0.50
Bromochloromethane	<0.50	<0.50	<0.50
Bromodichloromethane	<0.50	<0.50	<0.50
Bromoform	<0.50	<0.50	<0.50
Bromomethane	<0.50	<0.50	<0.50
n-Butylbenzene	<0.50	<0.50	<0.50
sec-Butylbenzene	<0.50	<0.50	<0.50
tert-Butylbenzene	<0.50	<0.50	<0.50
Carbon tetrachloride	<0.50	<0.50	<0.50
Chlorobenzene	<0.50	<0.50	<0.50
Chloroethane	<0.50	<0.50	<0.50
Chloroform	<0.50	<0.50	<0.50
Chloromethane	<0.50	<0.50	<0.50
2-Chlorotoluene	<0.50	<0.50	<0.50
4-Chlorotoluene	<0.50	<0.50	<0.50
Dibromochloromethane	<0.50	<0.50	<0.50
1,2-Dibromo-3-chloropropane	<0.50	<0.50	<0.50
1,2-Dibromoethane	<0.50	<0.50	<0.50
Dibromomethane	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	<0.50	<0.50	<0.50
Dichlorodifluoromethane	<0.50	<0.50	<0.50
1,1-Dichloroethane	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	<0.50	<0.50	<0.50
trans-1,2-Dichloroethene	<0.50	<0.50	<0.50
1,2-Dichloropropane	<0.50	<0.50	<0.50
1,3-Dichloropropane	<0.50	<0.50	<0.50
2,2-Dichloropropane	<0.50	<0.50	<0.50
1,1-Dichloropropene	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	<0.50	<0.50	<0.50
Ethylbenzene	<0.50	<0.50	<0.50
Hexachlorobutadiene	<0.50	<0.50	<0.50

J – the analyte was positively identified, the associated value is estimated.

UJ – Analyte was not detected above the quantitation limit which is estimated.

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PT – result is estimated because the sample was not analyzed within the required holding time.

Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch dst Bellevue WWTP at Knauss Rd
River Mile	RM 2.32	RM 1.35	RM 2.46
STORET ID	U05K15	U05P05	U05S09
Date Sampled	7/6/2009	7/6/2009	7/6/2009
Isopropylbenzene	<0.50	<0.50	<0.50
4-Isopropyltoluene	<0.50	<0.50	<0.50
Methylene chloride	<0.50	<0.50	<0.50
Naphthalene	<0.50	<0.50	<0.50
n-Propylbenzene	<0.50	<0.50	<0.50
Styrene	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50
Tetrachloroethene	<0.50	<0.50	<0.50
Toluene	<0.50	<0.50	<0.50
1,2,3-Trichlorobenzene	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	<0.50	<0.50	<0.50
Trichloroethene	<0.50	<0.50	<0.50
Trichlorofluoromethane	<0.50	<0.50	<0.50
1,2,3-Trichloropropane	<0.50	<0.50	<0.50
1,2,4-Trimethylbenzene	<0.50	<0.50	<0.50
1,3,5-Trimethylbenzene	<0.50	<0.50	<0.50
Vinyl chloride	<0.50	<0.50	<0.50
o-Xylene	<0.50	<0.50	<0.50
Total m&p-xylenes	<0.50	<0.50	<0.50
Method 625 - Semivolatile Compounds (ug/l)			
Acenaphthene	<5.4	<5.5	<5.2
Acenaphthylene	<5.4	<5.5	<5.2
Anthracene	<2.2	<2.2	<2.1
Benzo[a]anthracene	<2.2	<2.2	<2.1
Benzo[a]pyrene	<2.2	<2.2	<2.1
Benzo[b]fluoranthene	<2.2	<2.2	<2.1
Benzo[g,h,i]perylene	<2.2	<2.2	<2.1
Benzo[k]fluoranthene	<2.2	<2.2	<2.1
bis(2-Chloroethoxy)methane	<5.4	<5.5	<5.2
bis(2-Chloroethyl)ether	<2.2	<2.2	<2.1
bis(2-Chloroisopropyl)ether	<2.2	<2.2	<2.1
bis(2-Ethylhexyl)phthalate	<10.9	<11.0 PT	<10.3
4-Bromophenyl-phenylether	<5.4	<5.5	<5.2
Butylbenzylphthalate	<2.2	<2.2	<2.1
4-Chloro-3-methylphenol	<10.9	<11.0	<10.3 UJ
2-Chloronaphthalene	<5.4	<5.5	<5.2

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.

Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch dst Bellevue WWTP at Knauss Rd
River Mile	RM 2.32	RM 1.35	RM 2.46
STORET ID	U05K15	U05P05	U05S09
Date Sampled	7/6/2009	7/6/2009	7/6/2009
2-Chlorophenol	<2.2	<2.2	<2.1 UJ
4-Chlorophenyl-phenylether	<2.2	<2.2	<2.1
Chrysene	<2.2	<2.2	<2.1
Di-n-butylphthalate	<5.4	<5.5	<5.2
Di-n-octylphthalate	<2.2	<2.2	<2.1
Dibenz[a,h]anthracene	<2.2	<2.2	<2.1
1,3-Dichlorobenzene	<2.2	<2.2	<2.1
1,4-Dichlorobenzene	<2.2	<2.2	<2.1
1,2-Dichlorobenzene	<2.2	<2.2	<2.1
2,4-Dichlorophenol	<2.2	<2.2	<2.1 UJ
Diethylphthalate	<5.4	<5.5 PT	<5.2
2,4-Dimethylphenol	<10.9	<11.0	<10.3 UJ
Dimethylphthalate	<5.4	<5.5	<5.2
4,6-Dinitro-2-methylphenol	<5.4	<5.5	<5.2 UJ
2,4-Dinitrophenol	<21.7	<22.0	<20.6 UJ
2,6-Dinitrotoluene	<2.2	<2.2	<2.1
2,4-Dinitrotoluene	<2.2	<2.2	<2.1
Fluoranthene	<2.2	<2.2	<2.1
Fluorene	<2.2	<2.2	<2.1
Hexachlorobenzene	<2.2	<2.2	<2.1
Hexachlorobutadiene	<2.2	<2.2	<2.1
Hexachlorocyclopentadiene	<2.2	<2.2	<2.1
Hexachloroethane	<5.4	<5.5	<5.2
Indeno[1,2,3-cd]pyrene	<2.2	<2.2	<2.1
Isophorone	<2.2	<2.2	<2.1
N-Nitroso-di-n-propylamine	<2.2	<2.2	<2.1
N-Nitrosodiphenylamine	<5.4	<5.5	<5.2
Naphthalene	<2.2	<2.2	<2.1
Nitrobenzene	<2.2	<2.2	<2.1
2-Nitrophenol	<2.2	<2.2	<2.1 UJ
4-Nitrophenol	<21.7	<22.0	<20.6 UJ
Pentachlorophenol	<10.9	<11.0	<10.3 UJ
Phenanthrene	<2.2	<2.2	<2.1
Phenol	<2.2	<2.2	<2.1 UJ
Pyrene	<2.2	<2.2	<2.1
1,2,4-Trichlorobenzene	<2.2	<2.2	<2.1
2,4,6-Trichlorophenol	<5.4	<5.5	<5.2 UJ

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.

Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001101-03
Location	Mills Ck at Perkins Ave
River Mile	RM 1.35
STORET ID	U05P05
Date Sampled	7/6/2009
Method 608 - Pesticides (ug/l)	
Aldrin	<0.0021
a-BHC	0.003
b-BHC	<0.0021
d-BHC	<0.0021
y-BHC	<0.0021
4,4'-DDD	<0.0063
4,4'-DDE	<0.0021
4,4'-DDT	<0.0063
Dieldrin	<0.0021
Endosulfan I	<0.0021
Endosulfan II	<0.0021
Endosulfan sulfate	<0.021
Endrin	<0.0021
Endrin aldehyde	<0.0063
Heptachlor	<0.0021
Heptachlor epoxide	<0.0021
Methoxychlor	<0.010
Mirex	<0.010
Hexachlorobenzene	<0.0021
Method 608 - PCBs (ug/l)	
PCB-1016	<0.10
PCB-1221	<0.10
PCB-1232	<0.10
PCB-1242	<0.10
PCB-1248	<0.10
PCB-1254	<0.10
PCB-1260	<0.10

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UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.

Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch dst Bellevue WWTP at Knauss Rd
River Mile	RM 2.32	RM 1.35	RM 2.46
STORET ID	U05K15	U05P05	U05S09
Date Sampled	7/20/2009	7/20/2009	7/20/2009
Method 624 - Volatile Organic Compounds (ug/l)			
Benzene	<0.50	<0.50	<0.50
Bromobenzene	<0.50	<0.50	<0.50
Bromochloromethane	<0.50	<0.50	<0.50
Bromodichloromethane	<0.50	<0.50	<0.50
Bromoform	<0.50 UJ	<0.50 UJ	<0.50 UJ
Bromomethane	<0.50	<0.50	<0.50
n-Butylbenzene	<0.50	<0.50	<0.50
sec-Butylbenzene	<0.50	<0.50	<0.50
tert-Butylbenzene	<0.50	<0.50	<0.50
Carbon tetrachloride	<0.50	<0.50	<0.50
Chlorobenzene	<0.50	<0.50	<0.50
Chloroethane	<0.50	<0.50	<0.50
Chloroform	<0.50	<0.50	<0.50
Chloromethane	<0.50	<0.50	<0.50
2-Chlorotoluene	<0.50	<0.50	<0.50
4-Chlorotoluene	<0.50	<0.50	<0.50
Dibromochloromethane	<0.50	<0.50	<0.50
1,2-Dibromo-3-chloropropane	<0.50	<0.50	<0.50
1,2-Dibromoethane	<0.50	<0.50	<0.50
Dibromomethane	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	<0.50	<0.50	<0.50
Dichlorodifluoromethane	<0.50	<0.50	<0.50
1,1-Dichloroethane	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	<0.50	<0.50	<0.50
trans-1,2-Dichloroethene	<0.50	<0.50	<0.50
1,2-Dichloropropane	<0.50	<0.50	<0.50
1,3-Dichloropropane	<0.50	<0.50	<0.50
2,2-Dichloropropane	<0.50	<0.50	<0.50
1,1-Dichloropropene	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	<0.50	<0.50	<0.50
Ethylbenzene	<0.50	<0.50	<0.50
Hexachlorobutadiene	<0.50	<0.50	<0.50

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch dst Bellevue WWTP at Knauss Rd
River Mile	RM 2.32	RM 1.35	RM 2.46
STORET ID	U05K15	U05P05	U05S09
Date Sampled	7/20/2009	7/20/2009	7/20/2009
Isopropylbenzene	<0.50	<0.50	<0.50
4-Isopropyltoluene	<0.50	<0.50	<0.50
Methylene chloride	<0.50	<0.50	<0.50
Naphthalene	<0.50	<0.50	<0.50
n-Propylbenzene	<0.50	<0.50	<0.50
Styrene	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50
Tetrachloroethene	<0.50	<0.50	<0.50
Toluene	<0.50	<0.50	<0.50
1,2,3-Trichlorobenzene	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	<0.50	<0.50	<0.50
Trichloroethene	<0.50	<0.50	<0.50
Trichlorofluoromethane	<0.50	<0.50	<0.50
1,2,3-Trichloropropane	<0.50	<0.50	<0.50
1,2,4-Trimethylbenzene	<0.50	<0.50	<0.50
1,3,5-Trimethylbenzene	<0.50	<0.50	<0.50
Vinyl chloride	<0.50	<0.50	<0.50
o-Xylene	<0.50	<0.50	<0.50
Total m&p-xylenes	<0.50	<0.50	<0.50
Method 625 - Semivolatile Compounds (ug/l)			
Acenaphthene	<5.6	<5.6	<5.5
Acenaphthylene	<5.6	<5.6	<5.5
Anthracene	<2.3	<2.2	<2.2
Benzo[a]anthracene	<2.3	<2.2	<2.2
Benzo[a]pyrene	<2.3	<2.2	<2.2
Benzo[b]fluoranthene	<2.3	<2.2	<2.2
Benzo[g,h,i]perylene	<2.3	<2.2	<2.2
Benzo[k]fluoranthene	<2.3	<2.2	<2.2
bis(2-Chloroethoxy)methane	<5.6	<5.6	<5.5
bis(2-Chloroethyl)ether	<2.3	<2.2	<2.2
bis(2-Chloroisopropyl)ether	<2.3	<2.2	<2.2
bis(2-Ethylhexyl)phthalate	<11.2	<11.1	<11.0
4-Bromophenyl-phenylether	<5.6	<5.6	<5.5
Butylbenzylphthalate	<2.3	<2.2	<2.2
4-Chloro-3-methylphenol	<11.2	<11.1	<11.0
2-Chloronaphthalene	<5.6	<5.6	<5.5

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001101-02	0410001101-03	
Location	Pipe Ck at Columbus St	Mills Ck at Perkins Ave	Snyder's Ditch dst Bellevue WWTP at Knauss Rd
River Mile	RM 2.32	RM 1.35	RM 2.46
STORET ID	U05K15	U05P05	U05S09
Date Sampled	7/20/2009	7/20/2009	7/20/2009
2-Chlorophenol	<2.3	<2.2	<2.2
4-Chlorophenyl-phenylether	<2.3	<2.2	<2.2
Chrysene	<2.3	<2.2	<2.2
Di-n-butylphthalate	<5.6	<5.6	<5.5
Di-n-octylphthalate	<2.3	<2.2	<2.2
Dibenz[a,h]anthracene	<2.3	<2.2	<2.2
1,3-Dichlorobenzene	<2.3	<2.2	<2.2
1,4-Dichlorobenzene	<2.3	<2.2	<2.2
1,2-Dichlorobenzene	<2.3	<2.2	<2.2
2,4-Dichlorophenol	<2.3	<2.2	<2.2
Diethylphthalate	<5.6	<5.6	<5.5
2,4-Dimethylphenol	<11.2	<11.1	<11.0
Dimethylphthalate	<5.6	<5.6	<5.5
4,6-Dinitro-2-methylphenol	<5.6	<5.6	<5.5
2,4-Dinitrophenol	<22.5	<22.2	<22.0
2,6-Dinitrotoluene	<2.3	<2.2	<2.2
2,4-Dinitrotoluene	<2.3	<2.2	<2.2
Fluoranthene	<2.3	<2.2	<2.2
Fluorene	<2.3	<2.2	<2.2
Hexachlorobenzene	<2.3	<2.2	<2.2
Hexachlorobutadiene	<2.3	<2.2	<2.2
Hexachlorocyclopentadiene	<2.3	<2.2	<2.2
Hexachloroethane	<5.6	<5.6	<5.5
Indeno[1,2,3-cd]pyrene	<2.3	<2.2	<2.2
Isophorone	<2.3	<2.2	<2.2
N-Nitroso-di-n-propylamine	<2.3	<2.2	<2.2
N-Nitrosodiphenylamine	<5.6	<5.6	<5.5
Naphthalene	<2.3	<2.2	<2.2
Nitrobenzene	<2.3	<2.2	<2.2
2-Nitrophenol	<2.3	<2.2	<2.2
4-Nitrophenol	<22.5	<22.2	<22.0
Pentachlorophenol	<11.2	<11.1	<11.0
Phenanthrene	<2.3	<2.2	<2.2
Phenol	<2.3	<2.2	<2.2
Pyrene	<2.3	<2.2	<2.2
1,2,4-Trichlorobenzene	<2.3	<2.2	<2.2
2,4,6-Trichlorophenol	<5.6	<5.6	<5.5

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

\*Note: USEPA Method 525.2 is an approved method for the determination of organic compounds in drinking water (including source water), but is not approved for surface water unless it is a drinking water source (PWS use). Although Ohio EPA-DSW utilizes Method 525.2 mostly for the detection of herbicides that are not found using approved surface water methods, not all compounds detected (e.g. bis(2-Ethylhexyl)phthalate) are herbicides, but all analytes reported are reliably recovered using Method 525.2. At any site not designated as a drinking water source (PWS), the results of any compounds detected using Method 525.2 are a good indication of the presence and concentration of the compound, and are used for informational purposes only.

HUC	0410001102-04	
Location	Raccoon Ck dst Ohio Turnpike at TR 244	Raccoon Ck dst Ohio Turnpike at TR 244
River Mile	RM 5.45	RM 5.45
STORET ID	U05W17	U05W17
Date Sampled	6/2/2009	6/16/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*		
Acetochlor	0.64	<0.22
Alachlor	<0.22	<0.22
Atrazine	1.8	0.45
Benzo[a]pyrene	<0.55	<0.55
bis(2-Ethylhexyl)adipate	<0.55	<0.55
bis(2-Ethylhexyl)phthalate	<0.55	<0.55
Butachlor	<0.22	<0.22
Metolachlor	0.26	<0.22
Metribuzin	<0.22	<0.22
Pentachlorophenol	<5.49	<5.49
Propachlor	<0.22	<0.22
Simazine	<0.22	<0.22

J – the analyte was positively identified, the associated value is estimated.

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B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.



Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001102-04						
Location	Raccoon Ck at Limerick Rd	Raccoon Ck at US 20	Raccoon Ck dst Clyde WWTP Outfall (Mix Zone)	Raccoon Ck at Landfill N End (0.2 mi dst Clyde WWTP)	Raccoon Ck at TR 223	Raccoon Ck dst Ohio Turnpike at TR 244	Buck Ck at TR 223
River Mile	RM 13.26	RM 11.32	RM11.01	RM 10.80	RM 10.18	RM 5.45	RM 0.2
STORET ID	U05S01	U05P04	U05W33	U05W08	U05W10	U05W17	U05S03
Date Sampled	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009
Method 624 - Volatile Organic Compounds (ug/l)							
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromochloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Butylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
sec-Butylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
tert-Butylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroform	<0.50	<0.50	0.55	<0.50	<0.50	<0.50	<0.50
Chloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Chlorotoluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chlorotoluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dibromo-3-chloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dibromoethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromomethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,2-Dichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloropropene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobutadiene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001102-04						
Location River Mile STORET ID Date Sampled	Raccoon Ck at Limerick Rd RM 13.26 U05S01 7/7/2009	Raccoon Ck at US 20 RM 11.32 U05P04 7/7/2009	Raccoon Ck dst Clyde WWTP Outfall (Mix Zone) RM11.01 U05W33 7/7/2009	Raccoon Ck at Landfill N End (0.2 mi dst Clyde WWTP) RM 10.80 U05W08 7/7/2009	Raccoon Ck at TR 223 RM 10.18 U05W10 7/7/2009	Raccoon Ck dst Ohio Turnpike at TR 244 RM 5.45 U05W17 7/7/2009	Buck Ck at TR 223 RM 0.2 U05S03 7/7/2009
Isopropylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Isopropyltoluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Propylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-Trichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-Trichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3,5-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total m&p-xylenes	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Method 625 - Semivolatile Compounds (ug/l)							
Acenaphthene	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
Acenaphthylene	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
Anthracene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Benzo[a]anthracene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Benzo[a]pyrene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Benzo[b]fluoranthene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Benzo[g,h,i]perylene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Benzo[k]fluoranthene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
bis(2-Chloroethoxy)methane	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
bis(2-Chloroethyl)ether	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
bis(2-Chloroisopropyl)ether	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
bis(2-Ethylhexyl)phthalate	<10.9	<10.9	<10.5	<10.8	<10.9	<10.8	<10.8
4-Bromophenyl-phenylether	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
Butylbenzylphthalate	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
4-Chloro-3-methylphenol	<10.9	<10.9	<10.5	<10.8	<10.9	<10.8	<10.8
2-Chloronaphthalene	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001102-04						
Location	Raccoon Ck at Limerick Rd	Raccoon Ck at US 20	Raccoon Ck dst Clyde WWTP Outfall (Mix Zone)	Raccoon Ck at Landfill N End (0.2 mi dst Clyde WWTP)	Raccoon Ck at TR 223	Raccoon Ck dst Ohio Turnpike at TR 244	Buck Ck at TR 223
River Mile	RM 13.26	RM 11.32	RM11.01	RM 10.80	RM 10.18	RM 5.45	RM 0.2
STORET ID	U05S01	U05P04	U05W33	U05W08	U05W10	U05W17	U05S03
Date Sampled	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009
2-Chlorophenol	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
4-Chlorophenyl-phenylether	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Chrysene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Di-n-butylphthalate	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
Di-n-octylphthalate	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Dibenz[a,h]anthracene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
1,3-Dichlorobenzene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
1,4-Dichlorobenzene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
1,2-Dichlorobenzene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
2,4-Dichlorophenol	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Diethylphthalate	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
2,4-Dimethylphenol	<10.9	<10.9	<10.5	<10.8	<10.9	<10.8	<10.8
Dimethylphthalate	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
4,6-Dinitro-2-methylphenol	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
2,4-Dinitrophenol	<21.7	<21.9	<21.1	<21.5	<21.7	<21.5	<21.5
2,6-Dinitrotoluene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
2,4-Dinitrotoluene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Fluoranthene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Fluorene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Hexachlorobenzene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Hexachlorobutadiene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Hexachlorocyclopentadiene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Hexachloroethane	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
Indeno[1,2,3-cd]pyrene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Isophorone	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
N-Nitroso-di-n-propylamine	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
N-Nitrosodiphenylamine	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4
Naphthalene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Nitrobenzene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
2-Nitrophenol	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
4-Nitrophenol	<21.7	<21.9	<21.1	<21.5	<21.7	<21.5	<21.5
Pentachlorophenol	<10.9	<10.9	<10.5	<10.8	<10.9	<10.8	<10.8
Phenanthrene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Phenol	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
Pyrene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
1,2,4-Trichlorobenzene	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.2
2,4,6-Trichlorophenol	<5.4	<5.5	<5.3	<5.4	<5.4	<5.4	<5.4

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001102-04						
Location	Raccoon Ck at Limerick Rd	Raccoon Ck at US 20	Raccoon Ck dst Clyde WWTP Outfall (Mix Zone)	Raccoon Ck at Landfill N End (0.2 mi dst Clyde WWTP)	Raccoon Ck at TR 223	Raccoon Ck dst Ohio Turnpike at TR 244	Buck Ck at TR 223
River Mile	RM 13.26	RM 11.32	RM11.01	RM 10.80	RM 10.18	RM 5.45	RM 0.2
STORET ID	U05S01	U05P04	U05W33	U05W08	U05W10	U05W17	U05S03
Date Sampled	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009	7/7/2009
Method 608 - Pesticides (ug/l)							
Aldrin					<0.0022		<0.0023
a-BHC					<0.0022		<0.0023
b-BHC					<0.0022		<0.0023
d-BHC					<0.0022		<0.0023
y-BHC					<0.0022		<0.0023
4,4'-DDD					<0.0066		<0.0068
4,4'-DDE					<0.0022		<0.0023
4,4'-DDT					<0.0066		<0.0068
Dieldrin					<0.0022		0.0027
Endosulfan I					<0.0022		<0.0023
Endosulfan II					<0.0022		<0.0023
Endosulfan sulfate					<0.022		<0.023
Endrin					<0.0022		<0.0023
Endrin aldehyde					<0.0066		<0.0068
Heptachlor					<0.0022		<0.0023
Heptachlor epoxide					<0.0022		<0.0023
Methoxychlor					<0.011		<0.011
Mirex					<0.011		<0.011
Hexachlorobenzene					<0.0022		<0.0023
Method 608 - PCBs (ug/l)							
PCB-1016	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1221	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1232	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1242	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1248	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1254	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1260	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001102-04						
Location	Raccoon Ck at Limerick Rd	Raccoon Ck at US 20	Raccoon Ck dst Clyde WWTP Outfall (Mix Zone)	Raccoon Ck at Landfill N End (0.2 mi dst Clyde WWTP)	Raccoon Ck at TR 223	Raccoon Ck dst Ohio Turnpike at TR 244	Buck Ck at TR 223
River Mile	RM 13.26	RM 11.32	RM11.01	RM 10.80	RM 10.18	RM 5.45	RM 0.2
STORET ID	U05S01	U05P04	U05W33	U05W08	U05W10	U05W17	U05S03
Date Sampled	7/21/2009	7/21/2009	7/21/2009	8/4/2009	7/21/2009	7/21/2009	8/4/2009
Method 624 - Volatile Organic Compounds (ug/l)							
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromochloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	<0.50 UJ	0.62 J	<0.50 UJ	<0.50	<0.50 UJ	<0.50	<0.50
Bromomethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Butylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
sec-Butylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
tert-Butylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroform	<0.50	<0.50	0.71	<0.50	<0.50	<0.50	<0.50
Chloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Chlorotoluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chlorotoluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dibromo-3-chloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dibromoethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromomethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,2-Dichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloropropene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobutadiene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001102-04						
Location River Mile STORET ID Date Sampled	Raccoon Ck at Limerick Rd RM 13.26 U05S01 7/21/2009	Raccoon Ck at US 20 RM 11.32 U05P04 7/21/2009	Raccoon Ck dst Clyde WWTP Outfall (Mix Zone) RM11.01 U05W33 7/21/2009	Raccoon Ck at Landfill N End (0.2 mi dst Clyde WWTP) RM 10.80 U05W08 8/4/2009	Raccoon Ck at TR 223 RM 10.18 U05W10 7/21/2009	Raccoon Ck dst Ohio Turnpike at TR 244 RM 5.45 U05W17 7/21/2009	Buck Ck at TR 223 RM 0.2 U05S03 8/4/2009
Isopropylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Isopropyltoluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Propylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-Trichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-Trichloropropane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3,5-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total m&p-xylenes	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Method 625 - Semivolatile Compounds (ug/l)							
Acenaphthene	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
Acenaphthylene	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
Anthracene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Benzo[a]anthracene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Benzo[a]pyrene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Benzo[b]fluoranthene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Benzo[g,h,i]perylene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Benzo[k]fluoranthene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
bis(2-Chloroethoxy)methane	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
bis(2-Chloroethyl)ether	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
bis(2-Chloroisopropyl)ether	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
bis(2-Ethylhexyl)phthalate	<10.6	<11.0	<10.9	<10.9	<10.6	<11.0	<11.2
4-Bromophenyl-phenylether	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
Butylbenzylphthalate	<2.1	<2.2	<2.2	2.5	<2.1	<2.2	<2.2
4-Chloro-3-methylphenol	<10.6	<11.0	<10.9	<10.9	<10.6	<11.0	<11.2
2-Chloronaphthalene	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6

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River Mile	RM 13.26	RM 11.32	RM11.01	RM 10.80	RM 10.18	RM 5.45	RM 0.2
STORET ID	U05S01	U05P04	U05W33	U05W08	U05W10	U05W17	U05S03
Date Sampled	7/21/2009	7/21/2009	7/21/2009	8/4/2009	7/21/2009	7/21/2009	8/4/2009
2-Chlorophenol	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
4-Chlorophenyl-phenylether	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Chrysene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Di-n-butylphthalate	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
Di-n-octylphthalate	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Dibenz[a,h]anthracene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
1,3-Dichlorobenzene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
1,4-Dichlorobenzene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
1,2-Dichlorobenzene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
2,4-Dichlorophenol	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Diethylphthalate	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
2,4-Dimethylphenol	<10.6	<11.0	<10.9	<10.9	<10.6	<11.0	<11.2
Dimethylphthalate	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
4,6-Dinitro-2-methylphenol	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
2,4-Dinitrophenol	<21.2	<22.0	<21.9	<21.7	<21.3	<22.0	<22.3
2,6-Dinitrotoluene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
2,4-Dinitrotoluene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Fluoranthene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Fluorene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Hexachlorobenzene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Hexachlorobutadiene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Hexachlorocyclopentadiene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Hexachloroethane	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
Indeno[1,2,3-cd]pyrene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Isophorone	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
N-Nitroso-di-n-propylamine	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
N-Nitrosodiphenylamine	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6
Naphthalene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Nitrobenzene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
2-Nitrophenol	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
4-Nitrophenol	<21.2	<22.0	<21.9	<21.7	<21.3	<22.0	<22.3
Pentachlorophenol	<10.6	<11.0	<10.9	<10.9	<10.6	<11.0	<11.2
Phenanthrene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Phenol	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
Pyrene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
1,2,4-Trichlorobenzene	<2.1	<2.2	<2.2	<2.2	<2.1	<2.2	<2.2
2,4,6-Trichlorophenol	<5.3	<5.5	<5.5	<5.4	<5.3	<5.5	<5.6

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.

Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001102-04						
Location	Raccoon Ck at Limerick Rd	Raccoon Ck at US 20	Raccoon Ck dst Clyde WWTP Outfall (Mix Zone)	Raccoon Ck at Landfill N End (0.2 mi dst Clyde WWTP)	Raccoon Ck at TR 223	Raccoon Ck dst Ohio Turnpike at TR 244	Buck Ck at TR 223
River Mile	RM 13.26	RM 11.32	RM11.01	RM 10.80	RM 10.18	RM 5.45	RM 0.2
STORET ID	U05S01	U05P04	U05W33	U05W08	U05W10	U05W17	U05S03
Date Sampled	7/21/2009	7/21/2009	7/21/2009	8/4/2009	7/21/2009	7/21/2009	8/4/2009
Method 608 - Pesticides (ug/l)							
Aldrin	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
a-BHC	<0.0022	<0.0021	<0.0022	<0.0022	0.0034	<0.0021	<0.0022
b-BHC	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
d-BHC	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
y-BHC	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
4,4'-DDD	<0.0065	<0.0063	<0.0065	<0.0065	<0.0064	<0.0064	<0.0066
4,4'-DDE	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
4,4'-DDT	<0.0065	<0.0063	<0.0065	<0.0065	<0.0064	<0.0064	<0.0066
Dieldrin	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
Endosulfan I	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
Endosulfan II	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
Endosulfan sulfate	<0.022	<0.021	<0.022	<0.022	<0.021	<0.021	<0.022
Endrin	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
Endrin aldehyde	<0.0065	<0.0063	<0.0065	<0.0065	<0.0064	<0.0064	<0.0066
Heptachlor	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
Heptachlor epoxide	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021 UJ	<0.0022
Methoxychlor	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Mirex	<0.011	<0.011	<0.011	<0.011 UJ	<0.011	<0.011	<0.011 UJ
Hexachlorobenzene	<0.0022	<0.0021	<0.0022	<0.0022	<0.0021	<0.0021	<0.0022
Method 608 - PCBs (ug/l)							
PCB-1016	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1221	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1232	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1242	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1248	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1254	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
PCB-1260	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11

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UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.



Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

\*Note: USEPA Method 525.2 is an approved method for the determination of organic compounds in drinking water (including source water), but is not approved for surface water unless it is a drinking water source (PWS use). Although Ohio EPA-DSW utilizes Method 525.2 mostly for the detection of herbicides that are not found using approved surface water methods, not all compounds detected (e.g. bis(2-Ethylhexyl)phthalate) are herbicides, but all analytes reported are reliably recovered using Method 525.2. At any site not designated as a drinking water source (PWS), the results of any compounds detected using Method 525.2 are a good indication of the presence and concentration of the compound, and are used for informational purposes only.

HUC	0410001112-03
<b>Location</b>	<b>Green Ck at TR 239</b>
<b>River Mile</b>	<b>RM 5.06</b>
STORET ID	U04K01
Date Sampled	6/2/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*	
Acetochlor	0.94
Alachlor	<0.21
Atrazine	3.2
Benzo[a]pyrene	<0.53
bis(2-Ethylhexyl)adipate	<0.53
bis(2-Ethylhexyl)phthalate	<0.53
Butachlor	<0.21
Metolachlor	0.55
Metribuzin	<0.21
Pentachlorophenol	<5.32
Propachlor	<0.21
Simazine	0.26

HUC	0410001112-03
<b>Location</b>	<b>Green Ck at TR 239</b>
<b>River Mile</b>	<b>RM 5.06</b>
STORET ID	U04K01
Date Sampled	6/16/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*	
Acetochlor	0.26
Alachlor	<0.22
Atrazine	0.62
Benzo[a]pyrene	<0.54
bis(2-Ethylhexyl)adipate	<0.54
bis(2-Ethylhexyl)phthalate	<0.54
Butachlor	<0.22
Metolachlor	<0.22
Metribuzin	<0.22
Pentachlorophenol	<5.43
Propachlor	<0.22
Simazine	<0.22

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

\*Note: USEPA Method 525.2 is an approved method for the determination of organic compounds in drinking water (including source water), but is not approved for surface water unless it is a drinking water source (PWS use). Although Ohio EPA-DSW utilizes Method 525.2 mostly for the detection of herbicides that are not found using approved surface water methods, not all compounds detected (e.g. bis(2-Ethylhexyl)phthalate) are herbicides, but all analytes reported are reliably recovered using Method 525.2. At any site not designated as a drinking water source (PWS), the results of any compounds detected using Method 525.2 are a good indication of the presence and concentration of the compound, and are used for informational purposes only.

HUC	0410001112-02				
Location	Beaver Ck at SR 101	Beaver Ck at SR 101	Beaver Ck at SR 101	Beaver Ck at SR 101	Beaver Ck at SR 101
River Mile	RM 3.48	RM 3.48	RM 3.48	RM 3.48	RM 3.48
STORET ID	U05G25	U05G25	U05G25	U05G25	U05G25
Date Sampled	6/3/2009	6/17/2009	7/8/2009	7/22/2009	8/5/2009
Method 525.2 – Herbicides & other organic compounds (ug/l)*					
Acetochlor	0.74	0.32	0.47 J	0.3 J	0.43
Alachlor	<0.21	<0.22	<0.22 UJ	<0.23	<0.21
Atrazine	2.85	1.44	1.29 J	1.01	0.84
Benzo[a]pyrene	<0.53	<0.54	<0.54 UJ	<0.56	<0.53
bis(2-Ethylhexyl)adipate	<0.53	<0.54	<0.54 UJ	<0.56	<0.53
bis(2-Ethylhexyl)phthalate	<0.53	<0.54	0.72 J	<0.56	<0.53
Butachlor	<0.21	<0.22	<0.22 UJ	<0.23	<0.21
Metolachlor	0.38	<0.22	0.5 J	0.34	0.31
Metribuzin	<0.21	<0.22	<0.22 UJ	<0.23	<0.21
Pentachlorophenol	<5.26	<5.41	<5.38 UJ	<5.62	<5.29
Propachlor	<0.21	<0.22	<0.22 UJ	<0.23	<0.21
Simazine	<0.21	<0.22	<0.22 UJ	<0.23	<0.21

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001113-02			
Location	Sandusky R at Tiffin Rd	Sandusky R at State St	Sandusky R at Tiffin Rd	Sandusky R at State St
River Mile	RM 17.70	RM 15.40	RM 17.70	RM 15.40
STORET ID	U04S23	U04W11	U04S23	U04W11
Date Sampled	7/9/2009	7/9/2009	7/23/2009	7/23/2009
Method 624 - Volatile Organic Compounds (ug/l)				
Benzene	<0.50	<0.50	<0.50	<0.50
Bromobenzene	<0.50	<0.50	<0.50	<0.50
Bromochloromethane	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	<0.50	<0.50	<0.50	<0.50
Bromoform	<0.50 UJ	<0.50	<0.50 UJ	<0.50 UJ
Bromomethane	<0.50	<0.50	<0.50	<0.50
n-Butylbenzene	<0.50	<0.50	<0.50	<0.50
sec-Butylbenzene	<0.50	<0.50	<0.50	<0.50
tert-Butylbenzene	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	<0.50	<0.50	<0.50	<0.50
Chloroethane	<0.50	<0.50	<0.50	<0.50
Chloroform	<0.50	<0.50	<0.50	<0.50
Chloromethane	<0.50	<0.50	<0.50	<0.50
2-Chlorotoluene	<0.50	<0.50	<0.50	<0.50
4-Chlorotoluene	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	<0.50	<0.50	<0.50	<0.50
1,2-Dibromo-3-chloropropane	<0.50 UJ	<0.50	<0.50	<0.50
1,2-Dibromoethane	<0.50	<0.50	<0.50	<0.50
Dibromomethane	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethene	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethene	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethene	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	<0.50	<0.50	<0.50	<0.50
1,3-Dichloropropane	<0.50	<0.50	<0.50	<0.50
2,2-Dichloropropane	<0.50	<0.50	<0.50	<0.50
1,1-Dichloropropene	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	<0.50	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	<0.50	<0.50	<0.50	<0.50
Hexachlorobutadiene	<0.50	<0.50	<0.50	<0.50

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UJ - Analyte was not detected above the quantitation limit which is estimated.

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001113-02			
Location	Sandusky R at Tiffin Rd	Sandusky R at State St	Sandusky R at Tiffin Rd	Sandusky R at State St
River Mile	RM 17.70	RM 15.40	RM 17.70	RM 15.40
STORET ID	U04S23	U04W11	U04S23	U04W11
Date Sampled	7/9/2009	7/9/2009	7/23/2009	7/23/2009
Isopropylbenzene	<0.50	<0.50	<0.50	<0.50
4-Isopropyltoluene	<0.50	<0.50	<0.50	<0.50
Methylene chloride	<0.50	<0.50	<0.50	<0.50
Naphthalene	<0.50	<0.50	<0.50	<0.50
n-Propylbenzene	<0.50	<0.50	<0.50	<0.50
Styrene	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	<0.50	<0.50	<0.50	<0.50
Toluene	<0.50	<0.50	<0.50	<0.50
1,2,3-Trichlorobenzene	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	<0.50	<0.50	<0.50	<0.50
Trichloroethene	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	<0.50	<0.50	<0.50	<0.50
1,2,3-Trichloropropane	<0.50	<0.50	<0.50	<0.50
1,2,4-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50
1,3,5-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	<0.50	<0.50	<0.50	<0.50
o-Xylene	<0.50	<0.50	<0.50	<0.50
Total m&p-xylenes	<0.50	<0.50	<0.50	<0.50
Method 625 - Semivolatile Compounds (ug/l)				
Acenaphthene	<5.3	<5.4	<5.4	<5.5
Acenaphthylene	<5.3	<5.4	<5.4	<5.5
Anthracene	<2.1	<2.2	<2.1	<2.2
Benzo[a]anthracene	<2.1	<2.2	<2.1	<2.2
Benzo[a]pyrene	<2.1	<2.2	<2.1	<2.2
Benzo[b]fluoranthene	<2.1	<2.2	<2.1	<2.2
Benzo[g,h,i]perylene	<2.1	<2.2	<2.1	<2.2
Benzo[k]fluoranthene	<2.1	<2.2	<2.1	<2.2
bis(2-Chloroethoxy)methane	<5.3	<5.4	<5.4	<5.5
bis(2-Chloroethyl)ether	<2.1	<2.2	<2.1	<2.2
bis(2-Chloroisopropyl)ether	<2.1	<2.2	<2.1	<2.2
bis(2-Ethylhexyl)phthalate	<10.6	<10.8	<10.7	<11.0
4-Bromophenyl-phenylether	<5.3	<5.4	<5.4	<5.5
Butylbenzylphthalate	<2.1	<2.2	<2.1	<2.2
4-Chloro-3-methylphenol	<10.6	<10.8	<10.7	<11.0
2-Chloronaphthalene	<5.3	<5.4	<5.4	<5.5

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UJ - Analyte was not detected above the quantitation limit which is estimated.

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Appendix C. Surface water results for volatile and semivolatile organic compounds, herbicides, pesticides, and PCBs from samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2009.

HUC	0410001113-02			
Location	Sandusky R at Tiffin Rd	Sandusky R at State St	Sandusky R at Tiffin Rd	Sandusky R at State St
River Mile	RM 17.70	RM 15.40	RM 17.70	RM 15.40
STORET ID	U04S23	U04W11	U04S23	U04W11
Date Sampled	7/9/2009	7/9/2009	7/23/2009	7/23/2009
2-Chlorophenol	<2.1	<2.2	<2.1	<2.2
4-Chlorophenyl-phenylether	<2.1	<2.2	<2.1	<2.2
Chrysene	<2.1	<2.2	<2.1	<2.2
Di-n-butylphthalate	<5.3	<5.4	<5.4	<5.5
Di-n-octylphthalate	<2.1	<2.2	<2.1	<2.2
Dibenz[a,h]anthracene	<2.1	<2.2	<2.1	<2.2
1,3-Dichlorobenzene	<2.1	<2.2	<2.1	<2.2
1,4-Dichlorobenzene	<2.1	<2.2	<2.1	<2.2
1,2-Dichlorobenzene	<2.1	<2.2	<2.1	<2.2
2,4-Dichlorophenol	<2.1	<2.2	<2.1	<2.2
Diethylphthalate	<5.3	<5.4	<5.4	<5.5
2,4-Dimethylphenol	<10.6	<10.8	<10.7	<11.0
Dimethylphthalate	<5.3	<5.4	<5.4	<5.5
4,6-Dinitro-2-methylphenol	<5.3	<5.4	<5.4	<5.5
2,4-Dinitrophenol	<21.3	<21.6	<21.4	<22.1
2,6-Dinitrotoluene	<2.1	<2.2	<2.1	<2.2
2,4-Dinitrotoluene	<2.1	<2.2	<2.1	<2.2
Fluoranthene	<2.1	<2.2	<2.1	<2.2
Fluorene	<2.1	<2.2	<2.1	<2.2
Hexachlorobenzene	<2.1	<2.2	<2.1	<2.2
Hexachlorobutadiene	<2.1	<2.2	<2.1	<2.2
Hexachlorocyclopentadiene	<2.1	<2.2	<2.1	<2.2
Hexachloroethane	<5.3	<5.4	<5.4	<5.5
Indeno[1,2,3-cd]pyrene	<2.1	<2.2	<2.1	<2.2
Isophorone	<2.1	<2.2	<2.1	<2.2
N-Nitroso-di-n-propylamine	<2.1	<2.2	<2.1	<2.2
N-Nitrosodiphenylamine	<5.3	<5.4	<5.4	<5.5
Naphthalene	<2.1	<2.2	<2.1	<2.2
Nitrobenzene	<2.1	<2.2	<2.1	<2.2
2-Nitrophenol	<2.1	<2.2	<2.1	<2.2
4-Nitrophenol	<21.3	<21.6	<21.4	<22.1
Pentachlorophenol	<10.6	<10.8	<10.7	<11.0
Phenanthrene	<2.1	<2.2	<2.1	<2.2
Phenol	<2.1	<2.2	<2.1	<2.2
Pyrene	<2.1	<2.2	<2.1	<2.2
1,2,4-Trichlorobenzene	<2.1	<2.2	<2.1	<2.2
2,4,6-Trichlorophenol	<5.3	<5.4	<5.4	<5.5

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

PT – result is estimated because the sample was not analyzed within the required holding time.

## **Appendix D – Sediment Results for Metals**

**Appendix D.** Metals concentrations (mg/kg or ppm dry weight) in sediment samples collected in 2009 from Selected Sandusky Bay tributaries. Values reported as less than (<) were below the quantitation limit.

**HURON ERIE LAKE PLAIN (HELP) ECOREGION**

HUC10→	0410001101			0410001102	
Parameter	(-02) PIPE CK AT US 6 (RM 0.98) 2009	(-03) MILLS CK AT PORTLAND RD (RM 10.40) 2009	(-03) MILLS CK AT MONROE ST (RM 0.07) 2009	(-04) RACCOON CK AT BRUGGER RD (RM 1.07) 2009	(-04) BUCK CK AT TR 223 (RM 0.20) 2009
Solids (%)	54.2%	69.9%	57.9%	72.9%	73.6%
TOC (%)	NA	NA	NA	NA	NA
Aluminum	10200	7170	7220	5410	5950
Arsenic	5.06	5.12	4.56	4.64	6.3
Barium	61.4	60.2	50.5	37.3	46.3
Cadmium	0.415	0.188	0.394	0.297	0.303
Calcium	28400	7590	30500	18800	9400
Chromium	13.2	19.6	17.9	8.23	7.68
Copper	19.4	13	22.7	11	9.46
Iron	16300	15700	14000	12300	13900
Lead	40.4	14.4	25.9	11.9	14.2
Magnesium	5490	2940	5370	5320	3040
Manganese	226	359	279	251	571
Mercury	0.063	0.059	0.067	<0.023	<0.023
Nickel	18.9	13.8	14.3	15.3	12.7
Potassium	1560	<923	1110	961	985
Selenium	<0.95	<0.92	<0.89	<0.81	<0.73
Sodium	<2370	<2310	<2210	<2020	<1810
Strontium	61	17	47	74	42
Zinc	104	72.3	101	54.6	52.3

**Appendix D Continued.** Metals concentrations (mg/kg or ppm dry weight) in sediment samples collected in 2009 from Selected Sandusky Bay Tributaries. Values reported as less than (<) were below the quantitation limit.

**HURON ERIE LAKE PLAIN (HELP) ECOREGION**

HUC10→	0410001113		0410001114
Parameter	(-03) SANDUSKY R AT OHIO TURNPIKE (RM 8.94) 2009	(-03) SANDUSKY R UST YELLOW SWALE (RM 1.80) 2009	(-04) MUDDY CK AT EAST SIDE OF SR 53 (RM 1.23) 2009
Solids (%)	45.7%	43.3%	48.7%
TOC (%)	1.8%	1.6%	3.1%
Aluminum	17600	20300	18700
Arsenic	9.13	9.15	5.46
Barium	109	124	110
Cadmium	0.605	0.509	0.392
Calcium	27100	20100	38000
Chromium	17.6	20.7	18.6
Copper	23.2	24.8	21.8
Iron	28000	30600	23000
Lead	20.8	22.5	22
Magnesium	10400	8570	14200
Manganese	481	479	341
Mercury	0.274	0.099	0.041
Nickel	24.7	28.3	20.7
Potassium	2540	2730	2840
Selenium	<1.51	<1.78	<1.37
Sodium	<3770	<4440	<3420
Strontium	235	199	289
Zinc	123	134	126



## **Appendix E – Sediment Results for Pesticides, PCBs, and Semi-volatiles**

Appendix E. Concentrations of pesticides and PCBs (ug/kg or ppb dry weight) and semi-volatile compounds (mg/kg or ppm dry weight) in sediment samples collected from Select Sandusky Bay tributaries during 2009. Values reported as less than (<) were below the quantitation limit.

HUC	0410001101-02	0410001101-03		0410001102-04	
Location	Pipe Ck at US 6	Mills Ck at Portland Rd.	Mills Ck at Monroe St	Raccoon Ck at Brugger Rd.	Buck Ck at TR 223
River Mile	RM 0.98	RM 10.40	RM 0.07	RM 1.07	RM 0.20
STORET ID	U05K14	U05S07	U05P09	U05K08	U05S03
Date Sampled	5/13/2009	5/13/2009	5/13/2009	4/13/2009	4/13/2009
Method 8082A - Pesticides (ug/kg)					
% Solids	59.7 %	77.3 %	<5.9 %	78.8 %	79.4 %
Aldrin	<6.3	<4.9	<5.9	<4.9	<5
a-BHC	<6.3	<4.9	<5.9	<4.9	<5
b-BHC	<6.3	<4.9	<5.9	<4.9	<5
d-BHC	<6.3	<4.9	<5.9	<4.9	<5
y-BHC	<6.3	<4.9	<5.9	<4.9	<5
4,4'-DDD	<6.3	<4.9	<5.9	<4.9	22.7
4,4'-DDE	7.9	<4.9	<5.9	<4.9	52.5
4,4'-DDT	10.8	<4.9	<5.9	<4.9	34.5
Dieldrin	<6.3	4.9 P	<5.9	<4.9	7.2
Endosulfan I	<6.3	<4.9	<5.9	<4.9	<5
Endosulfan II	<6.3	<4.9	<5.9	<4.9	<5
Endosulfan sulfate	<6.3	<4.9	<5.9	<4.9	<5
Endrin	<6.3	<4.9	<5.9	<4.9	<5
Endrin aldehyde	<6.3	<4.9	<5.9	<4.9	<5
Heptachlor	<6.3	<4.9	<5.9	<4.9	<5
Heptachlor epoxide	<6.3	<4.9	<5.9	<4.9	<5
Methoxychlor	<6.3	<4.9	<5.9	<4.9	<5
Mirex	<6.3	<4.9	<5.9	<4.9	<5
Hexachlorobenzene	<6.3	<4.9	<5.9	<4.9	<5
Alpha-Chlordane	<6.3		8.6	<4.9	<5
Gamma-Chlordane	<6.3		<5.9	<4.9	<5
Oxychlordane	<6.3		<5.9	<4.9	<5
cis-Nonachlor	<6.3		<5.9	<4.9	<5
trans-Nonachlor	<6.3		<29.3	<4.9	<5
Toxaphene	<31.6		<5.9	<24.4	<24.8
Method 8082A - PCBs (ug/kg)					
PCB-1016	<31.6		<29.3	<24.4	<24.8
PCB-1221	<31.6		<29.3	<24.4	<24.8
PCB-1232	<31.6		<29.3	<24.4	<24.8
PCB-1242	<31.6 UJ		76.9	<24.4 UJ	<24.8 UJ
PCB-1248	<31.6		<29.3	<24.4	<24.8
PCB-1254	35.7		205	249	<24.8
PCB-1260	<31.6		32.4	32.5	<24.8

J – the analyte was positively identified, the associated value is estimated due to poor QC recovery.

UJ - Analyte was not detected above the quantitation limit which is estimated due to poor QC recovery.

P – Analyte is quantitated for pesticide and PCB analysis and there is >40% difference for detected concentrations from the 2 GC columns used.

Appendix E. Concentrations of pesticides and PCBs (ug/kg or ppb dry weight) and semi-volatile compounds (mg/kg or ppm dry weight) in sediment samples collected from Select Sandusky Bay tributaries during 2009. Values reported as less than (<) were below the quantitation limit.

HUC	0410001101-02	0410001101-03		0410001102-04	
Location	Pipe Ck at US 6	Mills Ck at Portland Rd.	Mills Ck at Monroe St	Raccoon Ck at Brugger Rd.	Buck Ck at TR 223
River Mile	RM 0.98	RM 10.40	RM 0.07	RM 1.07	RM 0.20
STORET ID	U05K14	U05S07	U05P09	U05K08	U05S03
Date Sampled	5/13/2009	5/13/2009	5/13/2009	4/13/2009	4/13/2009
Method 8270 - Semivolatile Compounds (mg/kg)					
Acenaphthene	<0.66	<0.52	<0.6	<0.48	<0.5
Acenaphthylene	<0.66	<0.52	<0.6	<0.48	<0.5
Acetophenone	<0.66	<0.52	<0.6	<0.48	<0.5
2-Acetylaminofluorene	<0.66	<0.52	<0.6	<0.48	<0.5
Aniline	<3.3	<2.6	<3	<2.4	<2.5
Anthracene	<0.66	<0.52	<0.6	<0.48	<0.5
Benz[a]anthracene	1.37	<0.52	1.91	<0.48	<0.5
Benzo[a]pyrene	1.39	<0.52	2.32	<0.48	<0.5
Benzo[b]fluoranthene	1.49	<0.52	2.42	<0.48	<0.5
Benzo[g,h,i]perylene	1.16	<0.52	1.73	<0.48	<0.5
Benzo[k]fluoranthene	1.32	<0.52	2.08	<0.48	<0.5
Benzyl alcohol	<0.66	<0.52	<0.6	<0.48	<0.5
bis(2-Chloroethoxy)methane	<0.66	<0.52	<0.6	<0.48	<0.5
bis(2-Chloroethyl)ether	<0.66	<0.52	<0.6	<0.48	<0.5
bis(2-Chloroisopropyl)ether	<0.66	<0.52	<0.6	<0.48	<0.5
bis(2-Ethylhexyl)phthalate	<0.66	<0.52	0.96	<0.48	<0.5
4-Bromophenyl-phenylether	<0.66	<0.52	<0.6	<0.48	<0.5
Butylbenzylphthalate	<0.66	<0.52	<0.6	<0.48	<0.5
4-Chloro-3-methylphenol	<0.66	<0.52	<0.6	<0.48	<0.5
2-Chloronaphthalene	<0.66	<0.52	<0.6	<0.48	<0.5
2-Chlorophenol	<0.66	<0.52	<0.6	<0.48	<0.5
4-Chlorophenyl-phenylether	<0.66	<0.52	<0.6	<0.48	<0.5
Chrysene	1.56	<0.52	2.66	<0.48	<0.5
Di-n-butylphthalate	<0.66	<0.52	<0.6	<0.48	<0.5
Di-n-octylphthalate	<0.66	<0.52	<0.6	<0.48	<0.5
Dibenz[a,h]anthracene	<0.66	<0.52	<0.6	<0.48	<0.5
Dibenzofuran	<0.66	<0.52	<0.6	<0.48	<0.5
1,3-Dichlorobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
1,4-Dichlorobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
1,2-Dichlorobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
3,3'-Dichlorobenzidine	<3.3	<2.6	<3	<2.4	<2.5
2,6-Dichlorophenol	<0.66	<0.52	<0.6	<0.48	<0.5
2,4-Dichlorophenol	<0.66	<0.52	<0.6	<0.48	<0.5
Diethylphthalate	<0.66	<0.52	<0.6	<0.48	<0.5
p-Dimethylaminoazobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
7,12-Dimethylbenz[a]anthracene	<3.3	<2.6	<3	<2.4	<2.5
2,4-Dimethylphenol	<0.66	<0.52	<0.6	<0.48	<0.5
Dimethylphthalate	<0.66	<0.52	<0.6	<0.48	<0.5
4,6-Dinitro-2-methylphenol	<0.66	<0.52	<0.6	<0.48	<0.5
1,3-Dinitrobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
2,4-Dinitrophenol	<3.3	<2.6	<3	<2.4	<2.5
2,6-Dinitrotoluene	<0.66	<0.52	<0.6	<0.48	<0.5
2,4-Dinitrotoluene	<0.66	<0.52	<0.6	<0.48	<0.5

J – the analyte was positively identified, the associated value is estimated due to poor QC recovery.

UJ – Analyte was not detected above the quantitation limit which is estimated due to poor QC recovery.

P – Analyte is quantitated for pesticide and PCB analysis and there is >40% difference for detected concentrations from the 2 GC columns used.

Appendix E. Concentrations of pesticides and PCBs (ug/kg or ppb dry weight) and semi-volatile compounds (mg/kg or ppm dry weight) in sediment samples collected from Select Sandusky Bay tributaries during 2009. Values reported as less than (<) were below the quantitation limit.

HUC	0410001101-02	0410001101-03		0410001102-04	
Location	Pipe Ck at US 6	Mills Ck at Portland Rd.	Mills Ck at Monroe St	Raccoon Ck at Brugger Rd.	Buck Ck at TR 223
River Mile	RM 0.98	RM 10.40	RM 0.07	RM 1.07	RM 0.20
STORET ID	U05K14	U05S07	U05P09	U05K08	U05S03
Date Sampled	5/13/2009	5/13/2009	5/13/2009	4/13/2009	4/13/2009
Dinoseb	<0.66	<0.52	<0.6	<0.48	<0.5
Diphenylamine	<0.66	<0.52	<0.6	<0.48	<0.5
Ethyl methanesulfonate	<0.66	<0.52	<0.6	<0.48	<0.5
Fluoranthene	2.67	0.53	5.31	<0.48	<0.5
Fluorene	<0.66	<0.52	<0.6	<0.48	<0.5
Hexachlorobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
Hexachlorobutadiene	<0.66	<0.52	<0.6	<0.48	<0.5
Hexachlorocyclopentadiene	<0.66	<0.52	<0.6	<0.48	<0.5
Hexachloroethane	<0.66	<0.52	<0.6	<0.48	<0.5
Hexachloropropene	<0.66	<0.52	<0.6	<0.48	<0.5
Indeno[1,2,3-cd]pyrene	1.2	<0.52	1.91	<0.48	<0.5
Isophorone	<0.66	<0.52	<0.6	<0.48	<0.5
Methyl methanesulfonate	<0.66	<0.52	<0.6	<0.48	<0.5
3-Methylcholanthrene	<0.66	<0.52	<0.6	<0.48	<0.5
2-Methylnaphthalene	<0.66	<0.52	<0.6	<0.48	<0.5
3&4-Methylphenol	<0.66	<0.52	<0.6	<0.48	<0.5
2-Methylphenol	<0.66	<0.52	<0.6	<0.48	<0.5
N-Nitroso-di-n-butylamine	<0.66	<0.52	<0.6	<0.48	<0.5
N-Nitroso-di-n-propylamine	<0.66	<0.52	<0.6	<0.48	<0.5
N-Nitrosomorpholine	<0.66	<0.52	<0.6	<0.48	<0.5
N-Nitrosopiperidine	<0.66	<0.52	<0.6	<0.48	<0.5
N-Nitrosopyrrolidine	<0.66	<0.52	<0.6	<0.48	<0.5
Naphthalene	<0.66	<0.52	<0.6	<0.48	<0.5
1,4-Naphthoquinone	<0.66	<0.52	<0.6	<0.48	<0.5
2-Nitroaniline	<0.66	<0.52	<0.6	<0.48	<0.5
4-Nitroaniline	<0.66	<0.52	<0.6	<0.48	<0.5
Nitrobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
4-Nitrophenol	<3.3	<2.6	<3	<2.4	<2.5
2-Nitrophenol	<0.66	<0.52	<0.6	<0.48	<0.5
Pentachlorobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
Pentachlorophenol	4.53 J	<0.52 UJ	1.57 J	1.24 UJ	1.15 UJ
Phenacetin	<0.66	<0.52	<0.6	<0.48	<0.5
Phenanthrene	0.68	<0.52	2.89	<0.48	<0.5
Phenol	<0.66	<0.52	<0.6	<0.48	<0.5
2-Picoline	<0.66	<0.52	<0.6	<0.48	<0.5
Pronamide	<0.66	<0.52	<0.6	<0.48	<0.5
Pyrene	2.17	<0.52	4.28	<0.48	<0.5
Safrole	<0.66	<0.52	<0.6	<0.48	<0.5
1,2,4,5-Tetrachlorobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
2,3,4,6-Tetrachlorophenol	<0.66	<0.52	<0.6	<0.48	<0.5
1,2,4-Trichlorobenzene	<0.66	<0.52	<0.6	<0.48	<0.5
2,4,6-Trichlorophenol	<0.66	<0.52	<0.6	<0.48	<0.5
2,4,5-Trichlorophenol	<0.66	<0.52	<0.6	<0.48	<0.5

J – the analyte was positively identified, the associated value is estimated due to poor QC recovery.

UJ - Analyte was not detected above the quantitation limit which is estimated due to poor QC recovery.

P – Analyte is quantitated for pesticide and PCB analysis and there is >40% difference for detected concentrations from the 2 GC columns used.

Appendix E. Concentrations of pesticides and PCBs (ug/kg or ppb dry weight) and semi-volatile compounds (mg/kg or ppm dry weight) in sediment samples collected from Select Sandusky Bay tributaries during 2009. Values reported as less than (<) were below the quantitation limit.

HUC	0410001113-03		0410001114-04
Location	Sandusky R at Ohio Turnpike	Sandusky R ust Yellow Swale	Muddy Ck at East Side of SR 53
River Mile	RM 8.94	RM 1.80	RM 1.23
STORET ID	U04P01	201314	U04Q13
Date Sampled			
Method 8082A - Pesticides (ug/kg)			
% Solids	50.7 %	46.9 %	55.7 %
Aldrin	<7.8	<8.5	<7.1
a-BHC	<7.8	<8.5	<7.1
b-BHC	<7.8	<8.5	<7.1
d-BHC	<7.8	<8.5	<7.1
y-BHC	<7.8	<8.5	<7.1
4,4'-DDD	<7.8	<8.5	<7.1
4,4'-DDE	<7.8	<8.5	<7.1
4,4'-DDT	<7.8	<8.5	<7.1
Dieldrin	<7.8	<8.5	<7.1
Endosulfan I	<7.8	<8.5	<7.1
Endosulfan II	<7.8	<8.5	<7.1
Endosulfan sulfate	<7.8	<8.5	<7.1
Endrin	<7.8	<8.5	<7.1
Endrin aldehyde	<7.8	<8.5	<7.1
Heptachlor	<7.8	<8.5	<7.1
Heptachlor epoxide	<7.8	<8.5	<7.1
Methoxychlor	<7.8	<8.5	<7.1
Mirex	<7.8	<8.5	<7.1
Hexachlorobenzene	<7.8	<8.5	<7.1
Alpha-Chlordane	<7.8	<8.5	
Gamma-Chlordane	<7.8	<8.5	
Oxychlordane	<7.8	<8.5	
cis-Nonachlor	<7.8	<8.5	
trans-Nonachlor	<7.8	<8.5	
Toxaphene	<39.2	<42.6	
Method 8082A - PCBs (ug/kg)			
PCB-1016	<39.2	<42.6	<35.7
PCB-1221	<39.2	<42.6	<35.7
PCB-1232	<39.2	<42.6	<35.7
PCB-1242	<39.2	<42.6	<35.7
PCB-1248	<39.2	<42.6	<35.7
PCB-1254	<39.2	<42.6	<35.7
PCB-1260	<39.2	<42.6	<35.7

J – the analyte was positively identified, the associated value is estimated due to poor QC recovery.

UJ - Analyte was not detected above the quantitation limit which is estimated due to poor QC recovery.

P – Analyte is quantitated for pesticide and PCB analysis and there is >40% difference for detected concentrations from the 2 GC columns used.

Appendix E. Concentrations of pesticides and PCBs (ug/kg or ppb dry weight) and semi-volatile compounds (mg/kg or ppm dry weight) in sediment samples collected from Select Sandusky Bay tributaries during 2009. Values reported as less than (<) were below the quantitation limit.

HUC	0410001113-03		0410001114-04
Location	Sandusky R at Ohio Turnpike	Sandusky R ust Yellow Swale	Muddy Ck at East Side of SR 53
River Mile	RM 8.94	RM 1.80	RM 1.23
STORET ID	U04P01	201314	U04Q13
Date Sampled			
Method 8270 - Semivolatile Compounds (mg/kg)			
Acenaphthene	<0.78	<0.85	<0.7
Acenaphthylene	<0.78	<0.85	<0.7
Acetophenone	<0.78	<0.85	<0.7
2-Acetylaminofluorene	<0.78	<0.85	<0.7
Aniline	<3.9	<4.3	<3.5
Anthracene	<0.78	<0.85	<0.7
Benz[a]anthracene	<0.78	<0.85	<0.7
Benzo[a]pyrene	<0.78	<0.85	<0.7
Benzo[b]fluoranthene	<0.78	<0.85	<0.7
Benzo[g,h,i]perylene	<0.78	<0.85	<0.7
Benzo[k]fluoranthene	<0.78	<0.85	<0.7
Benzyl alcohol	<0.78	<0.85	<0.7
bis(2-Chloroethoxy)methane	<0.78	<0.85	<0.7
bis(2-Chloroethyl)ether	<0.78	<0.85	<0.7
bis(2-Chloroisopropyl)ether	<0.78	<0.85	<0.7
bis(2-Ethylhexyl)phthalate	<0.78	<0.85	<0.7
4-Bromophenyl-phenylether	<0.78	<0.85	<0.7
Butylbenzylphthalate	<0.78	<0.85	<0.7
4-Chloro-3-methylphenol	<0.78	<0.85	<0.7
2-Chloronaphthalene	<0.78	<0.85	<0.7
2-Chlorophenol	<0.78	<0.85	<0.7
4-Chlorophenyl-phenylether	<0.78	<0.85	<0.7
Chrysene	<0.78	<0.85	<0.7
Di-n-butylphthalate	<0.78	<0.85	<0.7
Di-n-octylphthalate	<0.78	<0.85	<0.7
Dibenz[a,h]anthracene	<0.78	<0.85	<0.7
Dibenzofuran	<0.78	<0.85	<0.7
1,3-Dichlorobenzene	<0.78	<0.85	<0.7
1,4-Dichlorobenzene	<0.78	<0.85	<0.7
1,2-Dichlorobenzene	<0.78	<0.85	<0.7
3,3'-Dichlorobenzidine	<3.9	<4.3	<3.5
2,6-Dichlorophenol	<0.78	<0.85	<0.7
2,4-Dichlorophenol	<0.78	<0.85	<0.7
Diethylphthalate	<0.78	<0.85	<0.7
p-Dimethylaminoazobenzene	<0.78	<0.85	<0.7
7,12-Dimethylbenz[a]anthracene	<3.9	<4.3	<3.5
2,4-Dimethylphenol	<0.78	<0.85	<0.7
Dimethylphthalate	<0.78	<0.85	<0.7
4,6-Dinitro-2-methylphenol	<0.78	<0.85	<0.7 UJ
1,3-Dinitrobenzene	<0.78	<0.85	<0.7
2,4-Dinitrophenol	<3.9	<4.3	<3.5 UJ
2,6-Dinitrotoluene	<0.78	<0.85	<0.7
2,4-Dinitrotoluene	<0.78	<0.85	<0.7

J – the analyte was positively identified, the associated value is estimated due to poor QC recovery.

UJ - Analyte was not detected above the quantitation limit which is estimated due to poor QC recovery.

P – Analyte is quantitated for pesticide and PCB analysis and there is >40% difference for detected concentrations from the 2 GC columns used.

Appendix E. Concentrations of pesticides and PCBs (ug/kg or ppb dry weight) and semi-volatile compounds (mg/kg or ppm dry weight) in sediment samples collected from Select Sandusky Bay tributaries during 2009. Values reported as less than (<) were below the quantitation limit.

HUC	0410001113-03		0410001114-04
Location	Sandusky R at Ohio Turnpike	Sandusky R ust Yellow Swale	Muddy Ck at East Side of SR 53
River Mile STORET ID Date Sampled	RM 8.94 U04P01	RM 1.80 201314	RM 1.23 U04Q13
Dinoseb	<0.78	<0.85	<0.7
Diphenylamine	<0.78	<0.85	<0.7
Ethyl methanesulfonate	<0.78	<0.85	<0.7
Fluoranthene	<0.78	<0.85	<0.7
Fluorene	<0.78	<0.85	<0.7
Hexachlorobenzene	<0.78	<0.85	<0.7
Hexachlorobutadiene	<0.78	<0.85	<0.7
Hexachlorocyclopentadiene	<0.78	<0.85	<0.7
Hexachloroethane	<0.78	<0.85	<0.7
Hexachloropropene	<0.78	<0.85	<0.7
Indeno[1,2,3-cd]pyrene	<0.78	<0.85	<0.7
Isophorone	<0.78	<0.85	<0.7
Methyl methanesulfonate	<0.78	<0.85	<0.7
3-Methylcholanthrene	<0.78	<0.85	<0.7
2-Methylnaphthalene	<0.78	<0.85	<0.7
3&4-Methylphenol	<0.78	<0.85	<0.7
2-Methylphenol	<0.78	<0.85	<0.7
N-Nitroso-di-n-butylamine	<0.78	<0.85	<0.7
N-Nitroso-di-n-propylamine	<0.78	<0.85	<0.7
N-Nitrosomorpholine	<0.78	<0.85	<0.7
N-Nitrosopiperidine	<0.78	<0.85	<0.7
N-Nitrosopyrrolidine	<0.78	<0.85	<0.7
Naphthalene	<0.78	<0.85	<0.7
1,4-Naphthoquinone	<0.78	<0.85	<0.7
2-Nitroaniline	<0.78	<0.85	<0.7
4-Nitroaniline	<0.78	<0.85	<0.7
Nitrobenzene	<0.78	<0.85	<0.7
4-Nitrophenol	<3.9	<4.3	<3.5 UJ
2-Nitrophenol	<0.78	<0.85	<0.7
Pentachlorobenzene	<0.78	<0.85	<0.7
Pentachlorophenol	<0.78	<0.85	3.48 J
Phenacetin	<0.78	<0.85	<0.7
Phenanthrene	<0.78	<0.85	<0.7
Phenol	<0.78	<0.85	<0.7
2-Picoline	<0.78	<0.85	<0.7
Pronamide	<0.78	<0.85	<0.7
Pyrene	<0.78	<0.85	<0.7
Safrole	<0.78	<0.85	<0.7
1,2,4,5-Tetrachlorobenzene	<0.78	<0.85	<0.7
2,3,4,6-Tetrachlorophenol	<0.78	<0.85	<0.7
1,2,4-Trichlorobenzene	<0.78	<0.85	<0.7
2,4,6-Trichlorophenol	<0.78	<0.85	<0.7 UJ
2,4,5-Trichlorophenol	<0.78	<0.85	<0.7

J – the analyte was positively identified, the associated value is estimated due to poor QC recovery.

UJ - Analyte was not detected above the quantitation limit which is estimated due to poor QC recovery.


P – Analyte is quantitated for pesticide and PCB analysis and there is >40% difference for detected concentrations from the 2 GC columns used.

## **Appendix F – Sediment Radiological Results**



<b>OHIO DEPARTMENT OF HEALTH BUREAU OF RADIATION PROTECTION</b>	<b>Date</b>
	<b>11/18/09</b>
<b>Program</b>	<b>Program File Number</b>
<b>Radiation Safety Officer: Special Assistance and Projects</b>	<b>F-01</b>
<b>Subject</b>	<b>TSDf Number</b>
<b>Eastern Sandusky County, Ohio, Cancer Cluster</b>	<b>RSO-SAP-2009009</b>
<b>Task</b>	<b>PAGE</b>
<b>Report on Radiological Analysis of Ohio Environmental Protection Agency (OEPA) Sandusky Bay Tributaries Sediment Samples Collected in Erie, Sandusky, and Seneca Counties, Ohio, From 04/13/09 to 07/27/09</b>	<b>1 of 3</b>

Prepared By

  
 \_\_\_\_\_  
 David Lipp, TWL Supervisor  
 Technical Support Section

Approved By

  
 \_\_\_\_\_  
 Stephen Helmer, Program Administrator  
 Technical Support Section

Task	TSDF Number	PAGE
<b>Report on Radiological Analysis of Ohio Environmental Protection Agency (OEPA) Sandusky Bay Tributaries Sediment Samples Collected in Erie, Sandusky, and Seneca Counties, Ohio, From 04/13/09 to 07/27/09</b>	<b>RSO-SAP-2009009</b>	<b>2 of 3</b>

On August 25, 2009, nine sediment samples, collected by the Ohio Environmental Protection Agency (OEPA) in accordance with the OEPA 2009 Study Plan for the Sandusky Bay Tributaries, were received by the Ohio Department of Health (ODH) Laboratory in Reynoldsburg, Ohio, for gross beta and gross alpha radiological analysis.

- The gross alpha radioactivity result for each of the nine OEPA sediment samples was less than the ODH Lab's lower limit of detection (LLD) for gross alpha.
- The gross beta radioactivity results for each of the nine OEPA sediment samples was less than the ODH Lab's LLD for gross beta.

As used in this document, the lower limit of detection (LLD) is defined as the smallest concentration of radioactive material sampled that has a 95% probability of being detected. (Radioactive material is "detected" if it yields an instrument response that leads the analyst to conclude that activity above the system background is present.)

**Table 1.** Results for Radiological Analysis of OEPA Sandusky Bay Tributaries Sediment Samples Collected in Erie, Sandusky, and Seneca Counties, Ohio, From 04/13/09 to 07/27/09

Date Sample Collected	Location of Sample	Gross Alpha (pCi/g)	Gross Beta (pCi/g)
4/13/09	Buck Creek at Township Road 223	< Lower Limit of Detection (LLD)	< LLD
4/13/09	Raccoon Creek at Brugger Road	< LLD	< LLD
5/13/09	Pipe Creek at Highway US 6	< LLD	< LLD
5/13/09	Mills Creek at Monroe Street	< LLD	< LLD
5/13/09	Mills Creek at Portland Road	< LLD	< LLD
6/10/09	Beaver Creek Reservoir	< LLD	< LLD
7/15/09	Raccoon Creek Reservoir	< LLD	< LLD
7/27/09	Sandusky River near the mouth	< LLD	< LLD

Task	TSDf Number	PAGE
<b>Report on Radiological Analysis of Ohio Environmental Protection Agency (OEPA) Sandusky Bay Tributaries Sediment Samples Collected in Erie, Sandusky, and Seneca Counties, Ohio, From 04/13/09 to 07/27/09</b>	<b>RSO-SAP-2009009</b>	<b>3 of 3</b>

Date Sample Collected	Location of Sample	Gross Alpha (pCi/g)	Gross Beta (pCi/g)
7/27/09	Sandusky River just upstream of the Ohio Turnpike	< LLD	< LLD

## **Appendix G - QHEI Attributes**





River Mile	QHEI	Gradient (ft/mile)	WWH Attributes										MWH Attributes										Total MLL MWH Attributes	(MWH HL+1)/(MWH+1) Ratio	(MWH MLL+1)/(MWH+1) Ratio							
			No Channelization or Recovered Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low Normal Overall Embeddedness	Max Depth > 40 cm	Low Normal Riffle Embeddedness	Total WWH Attributes	High Influence				Moderate Influence															
													Channelized or No Recovery Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)	Total HLL MWH Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development				Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Med. Overall Embeddedness	High/Med. Riffle Embeddedness	No Riffle
Key QHEI Components																																
(05-105) Westerhouse Ditch																																
Year: 2009																																
0.7	57.0	14.71										4					1													6	0.40	1.60
(05-108) Emerson Creek																																
Year: 2009																																
1.8	57.0	13.70										5					0													5	0.17	1.00
(05-109) Emerson Creek (Royer Ditch)																																
Year: 2009																																
6.8	30.3	2.55										1					3													6	2.00	5.00
(05-219) Muddy Creek																																
Year: 2009																																
0.9	59.5	0.10										5					2													4	0.50	1.17
(05-220) Little Muddy Creek																																
Year: 2009																																
1.7	47.5	0.10										4					2													5	0.60	1.60
(05-224) Fishing Creek																																
Year: 2009																																
0.2	21.5	0.10										1					4													5	2.50	5.00
(12-004) Sawmill Creek																																
Year: 2009																																
1.1	47.5	10.64										4					3													6	0.80	2.00

## **Appendix H – Packaging Plant Inspection Letter**





State of Ohio Environmental Protection Agency

**Northwest District Office**

347 North Dunbridge Rd.  
Bowling Green, OH 43402-9398

TELE: (419) 352-8461 FAX: (419) 352-8468  
www.epa.ohio.gov

Ted Strickland, Governor  
Lee Fisher, Lieutenant Governor  
Chris Korleski, Director

Re: Erie County  
Routh Packing

December 8, 2009

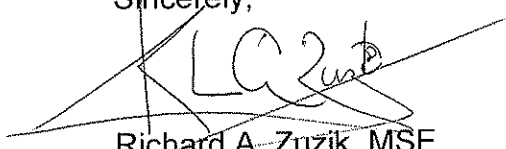
Mr. Jeff Myers  
Routh Packing  
4413 W. Bogart Road  
Sandusky, Ohio 44870

Dear Mr. Myers:

On December 1, 2009, a visit was made to investigate a report of an odorous discharge to Mills Creek in the area between Routh Packing and the adjacent salvage yard. Mr. Craig Stearns was also present. We walked the east perimeter of the aerated pretreatment lagoons and back along the west bank of Mills Creek. The banks of the lagoons appeared stable with no visible signs of leakage. No suspicious discharges were found. The report originated this past summer when our water quality group was sampling Mills Creek, and I may return next summer to observe the stream under low flow conditions.

Thank you for your full cooperation in investigating this matter.

Sincerely,

  
Richard A. Zuzik, MSE  
Division of Surface Water

/llr

pc: Rich Sinwald, City of Sandusky Pretreatment Coordinator  
Erie County Health Department

Dsw-Burns File

## **Appendix I – Fish Relative Numbers and Species**

# Species List

Page 1

River Code: <b>05-001</b>	Stream: <b>Sandusky River</b>	Sample Date: <b>2009</b>
River Mile: <b>18.30</b>	Location: just upst. Ballville Dam	Date Range: 07/14/2009
Time Fished: 4623 sec	Drainage: 1255.0 sq mi	Thru: 09/01/2009
Dist Fished: 1.00 km	Basin: Sandusky River	Sampler Type: A
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M		6	6.00	2.22	0.14	0.19	22.50
Quillback	C	O	M		7	7.00	2.59	2.22	3.05	317.14
Silver Redhorse	R	I	S	M	2	2.00	0.74	1.30	1.79	650.00
Golden Redhorse	R	I	S	M	32	32.00	11.85	8.55	11.76	267.19
River Redhorse [S]	R	I	S	I	1	1.00	0.37	0.40	0.55	400.00
Spotted Sucker	R	I	S		31	31.00	11.48	5.74	7.90	185.16
Common Carp	G	O	M	T	28	28.00	10.37	48.18	66.28	1,720.71
Golden Shiner	N	I	M	T	9	9.00	3.33	0.04	0.06	4.70
Spotfin Shiner	N	I	M		37	37.00	13.70	0.06	0.08	1.62
Bluntnose Minnow	N	O	C	T	4	4.00	1.48	0.02	0.02	4.25
Brown Bullhead		I	C	T	7	7.00	2.59	0.90	1.24	128.57
White Crappie	S	I	C		10	10.00	3.70	1.08	1.49	108.00
Largemouth Bass	F	C	C		9	9.00	3.33	2.65	3.64	293.89
Green Sunfish	S	I	C	T	12	12.00	4.44	0.48	0.65	39.58
Bluegill Sunfish	S	I	C	P	2	2.00	0.74	0.06	0.08	30.50
Orangespotted Sunfish	S	I	C		59	59.00	21.85	0.27	0.38	4.62
Green Sf X Bluegill Sf					14	14.00	5.19	0.61	0.84	43.83
<i>Mile Total</i>					270	270.00		72.69		
<i>Number of Species</i>					16					
<i>Number of Hybrids</i>					1					

## Species List

Page 2

River Code: <b>05-001</b>	Stream: <b>Sandusky River</b>	Sample Date: <b>2009</b>
River Mile: <b>16.80</b>	Location: upst. Roger Young Park	Date Range: 07/14/2009
Time Fished: 8737 sec	Drainage: 1256.0 sq mi	Thru: 08/31/2009
Dist Fished: 1.00 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M	25	25.00	3.63	14.20	2.23	568.00
Gizzard Shad		O	M	18	18.00	2.62	8.98	1.41	499.01
Redfin Pickerel		P	M P	1	1.00	0.15	0.00	0.00	3.00
Northern Pike	F	P	M	1	1.00	0.15	0.75	0.12	750.00
Bigmouth Buffalo	C	I	M	3	3.00	0.44	7.45	1.17	2,483.33
Smallmouth Buffalo	C	I	M	60	60.00	8.72	82.70	12.98	1,378.28
Quillback	C	O	M	31	31.00	4.51	15.78	2.48	508.87
Silver Redhorse	R	I	S M	13	13.00	1.89	14.85	2.33	1,142.31
Golden Redhorse	R	I	S M	137	137.00	19.91	41.10	6.45	299.96
Shorthead Redhorse	R	I	S M	4	4.00	0.58	1.76	0.28	440.00
Greater Redhorse [T]	R	I	S R	1	1.00	0.15	2.55	0.40	2,550.00
River Redhorse [S]	R	I	S I	4	4.00	0.58	4.65	0.73	1,162.50
Spotted Sucker	R	I	S	5	5.00	0.73	5.75	0.90	1,150.00
Common Carp	G	O	M T	160	160.00	23.26	365.03	57.28	2,281.41
Spotfin Shiner	N	I	M	67	67.00	9.74	0.10	0.02	1.50
Mimic Shiner	N	I	M I	6	6.00	0.87	0.01	0.00	2.17
Ghost Shiner	N	I	M	4	4.00	0.58	0.01	0.00	1.50
Bluntnose Minnow	N	O	C T	9	9.00	1.31	0.02	0.00	2.50
Grass Carp	E		M	2	2.00	0.29	21.32	3.35	10,660.00
Channel Catfish	F		C	44	44.00	6.40	20.50	3.22	465.81
Brown Bullhead		I	C T	2	2.00	0.29	0.36	0.06	177.50
Flathead Catfish	F	P	C	1	1.00	0.15	11.80	1.85	11,804.00
White Bass	F	P	M	4	4.00	0.58	1.02	0.16	255.00
White Perch	E		M	2	2.00	0.29	0.12	0.02	61.00
White Crappie	S	I	C	10	10.00	1.45	1.75	0.27	174.70
Black Crappie	S	I	C	1	1.00	0.15	0.08	0.01	80.00
Smallmouth Bass	F	C	C M	10	10.00	1.45	4.29	0.67	429.00
Largemouth Bass	F	C	C	4	4.00	0.58	2.29	0.36	572.50
Bluegill Sunfish	S	I	C P	4	4.00	0.58	0.37	0.06	92.50
Orangespotted Sunfish	S	I	C	7	7.00	1.02	0.05	0.01	6.43
Green Sf X Bluegill Sf				3	3.00	0.44	0.18	0.03	59.33
Yellow Perch			M	1	1.00	0.15	0.00	0.00	4.00
Logperch	D	I	S M	6	6.00	0.87	0.06	0.01	10.00
Fantail Darter	D	I	C	1	1.00	0.15	0.00	0.00	3.00
Freshwater Drum			M P	37	37.00	5.38	7.42	1.16	200.54
<i>Mile Total</i>				688	688.00		637.28		
<i>Number of Species</i>				34					
<i>Number of Hybrids</i>				1					

## Species List

Page 3

River Code: <b>05-001</b>	Stream: <b>Sandusky River</b>	Sample Date: <b>2009</b>
River Mile: <b>15.20</b>	Location: dst. State St.	Date Range: 07/13/2009
Time Fished: 9683 sec	Drainage: 1260.0 sq mi	Thru: 09/15/2009
Dist Fished: 1.50 km	Basin: Sandusky River	No of Passes: 3
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M	7	4.67	0.63	3.48	1.85	744.64
Gizzard Shad		O	M	448	298.67	40.62	3.69	1.96	12.35
Bigmouth Buffalo	C	I	M	1	0.67	0.09	1.57	0.83	2,350.00
Smallmouth Buffalo	C	I	M	32	21.33	2.90	34.76	18.52	1,629.53
Quillback	C	O	M	48	32.00	4.35	17.64	9.40	551.33
Silver Redhorse	R	I	S M	13	8.67	1.18	11.27	6.00	1,300.00
Black Redhorse	R	I	S I	1	0.67	0.09	0.18	0.10	270.00
Golden Redhorse	R	I	S M	230	153.33	20.85	35.42	18.87	230.98
Shorthead Redhorse	R	I	S M	1	0.67	0.09	0.66	0.35	995.00
Greater Redhorse [T]	R	I	S R	4	2.67	0.36	1.27	0.68	477.50
Spotted Sucker	R	I	S	2	1.33	0.18	0.17	0.09	126.50
Common Carp	G	O	M T	49	32.67	4.44	44.13	23.52	1,351.02
Goldfish	G	O	M T	34	22.67	3.08	5.95	3.17	262.31
Emerald Shiner	N	I	M	36	24.00	3.26	0.08	0.04	3.43
Spottail Shiner	N	I	M P	1	0.67	0.09	0.01	0.01	20.00
Spotfin Shiner	N	I	M	10	6.67	0.91	0.01	0.01	2.00
Sand Shiner	N	I	M M	7	4.67	0.63	0.01	0.00	1.43
Ghost Shiner	N	I	M	5	3.33	0.45	0.01	0.00	2.00
Channel Catfish	F		C	2	1.33	0.18	0.88	0.47	660.00
Brown Bullhead		I	C T	2	1.33	0.18	0.27	0.15	205.00
White Bass	F	P	M	23	15.33	2.09	0.88	0.47	57.65
White Perch	E		M	4	2.67	0.36	0.11	0.06	40.00
White Crappie	S	I	C	1	0.67	0.09	0.04	0.02	60.00
Black Crappie	S	I	C	1	0.67	0.09	0.12	0.06	180.00
Rock Bass	S	C	C	7	4.67	0.63	0.33	0.17	70.00
Smallmouth Bass	F	C	C M	22	14.67	1.99	5.62	2.99	383.14
Largemouth Bass	F	C	C	6	4.00	0.54	1.29	0.69	321.67
Green Sunfish	S	I	C T	6	4.00	0.54	0.11	0.06	26.67
Bluegill Sunfish	S	I	C P	12	8.00	1.09	0.49	0.26	61.75
Orangespotted Sunfish	S	I	C	16	10.67	1.45	0.10	0.05	9.06
Green Sf X Bluegill Sf				7	4.67	0.63	0.23	0.12	48.57
Walleye	F	P	S	3	2.00	0.27	0.37	0.20	185.00
Yellow Perch			M	7	4.67	0.63	0.08	0.04	16.86
Logperch	D	I	S M	5	3.33	0.45	0.02	0.01	4.80
Freshwater Drum			M P	50	33.33	4.53	16.45	8.76	493.44
<i>Mile Total</i>				1,103	735.33		187.68		
<i>Number of Species</i>				34					
<i>Number of Hybrids</i>				1					

# Species List

Page 4

River Code: <b>05-001</b>	Stream: <b>Sandusky River</b>	Sample Date: <b>2009</b>
River Mile: <b>12.80</b>	Location: dst. U.S. Rt. 20, opposite Fremont Yacht Club	Date Range: 07/13/2009
Time Fished: 5994 sec	Drainage: 1264.0 sq mi	Thru: 08/31/2009
Dist Fished: 1.00 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M		258	258.00	50.49	1.04	0.31	4.03
Bigmouth Buffalo	C	I	M		35	35.00	6.85	124.68	37.48	3,562.38
Smallmouth Buffalo	C	I	M		66	66.00	12.92	128.18	38.53	1,942.07
Quillback	C	O	M		14	14.00	2.74	5.81	1.75	415.00
Golden Redhorse	R	I	S	M	12	12.00	2.35	2.49	0.75	207.50
Shorthead Redhorse	R	I	S	M	1	1.00	0.20	0.12	0.04	120.00
Common Carp	G	O	M	T	30	30.00	5.87	47.24	14.20	1,574.67
Goldfish	G	O	M	T	14	14.00	2.74	3.32	1.00	237.18
Emerald Shiner	N	I	M		2	2.00	0.39	0.01	0.00	4.00
Spottail Shiner	N	I	M	P	2	2.00	0.39	0.01	0.00	4.00
Spotfin Shiner	N	I	M		3	3.00	0.59	0.01	0.00	3.00
Ghost Shiner	N	I	M		5	5.00	0.98	0.01	0.00	2.00
Common Carp X Goldfish	G	O		T	3	3.00	0.59	2.50	0.75	833.33
Channel Catfish	F		C		4	4.00	0.78	5.55	1.67	1,387.50
Yellow Bullhead		I	C	T	1	1.00	0.20	0.15	0.05	150.00
Flathead Catfish	F	P	C		2	2.00	0.39	6.95	2.09	3,475.00
White Bass	F	P	M		10	10.00	1.96	1.86	0.56	185.50
White Perch	E		M		10	10.00	1.96	0.06	0.02	6.00
Smallmouth Bass	F	C	C	M	1	1.00	0.20	0.16	0.05	160.00
Largemouth Bass	F	C	C		3	3.00	0.59	0.85	0.25	281.67
Green Sunfish	S	I	C	T	4	4.00	0.78	0.04	0.01	8.75
Bluegill Sunfish	S	I	C	P	6	6.00	1.17	0.21	0.06	34.17
Orangespotted Sunfish	S	I	C		10	10.00	1.96	0.12	0.03	11.60
Green Sf X Bluegill Sf					1	1.00	0.20	0.01	0.00	10.00
Yellow Perch			M		3	3.00	0.59	0.07	0.02	23.33
Freshwater Drum			M	P	10	10.00	1.96	1.24	0.37	124.00
Round Goby	E				1	1.00	0.20	0.02	0.01	20.00
<i>Mile Total</i>					511	511.00		332.68		
<i>Number of Species</i>					25					
<i>Number of Hybrids</i>					2					

# Species List

River Code: <b>05-001</b>	Stream: <b>Sandusky River</b>	Sample Date: <b>2009</b>
River Mile: <b>5.50</b>	Location: upst. Whitemans Grove	Date Range: 07/15/2009
Time Fished: 6226 sec	Drainage: 1330.0 sq mi	Thru: 09/01/2009
Dist Fished: 1.00 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M		2	2.00	0.32	0.08	0.06	40.00
Gizzard Shad		O	M		350	350.00	55.47	1.17	0.89	3.35
Bigmouth Buffalo	C	I	M		4	4.00	0.63	11.45	8.71	2,862.50
Smallmouth Buffalo	C	I	M		19	19.00	3.01	33.65	25.58	1,771.05
Golden Redhorse	R	I	S	M	31	31.00	4.91	3.43	2.60	110.48
Shorthead Redhorse	R	I	S	M	6	6.00	0.95	0.09	0.07	15.00
Spotted Sucker	R	I	S		3	3.00	0.48	0.09	0.06	28.33
Common Carp	G	O	M	T	40	40.00	6.34	58.55	44.52	1,463.75
Goldfish	G	O	M	T	33	33.00	5.23	6.77	5.14	205.00
Emerald Shiner	N	I	M		2	2.00	0.32	0.01	0.00	3.00
Spotfin Shiner	N	I	M		24	24.00	3.80	0.06	0.05	2.58
Mimic Shiner	N	I	M	I	2	2.00	0.32	0.00	0.00	2.00
Ghost Shiner	N	I	M		2	2.00	0.32	0.00	0.00	2.00
Bluntnose Minnow	N	O	C	T	2	2.00	0.32	0.01	0.00	3.00
Common Carp X Goldfish	G	O		T	1	1.00	0.16	1.00	0.76	1,000.00
Channel Catfish	F		C		5	5.00	0.79	3.05	2.32	610.00
Flathead Catfish	F	P	C		1	1.00	0.16	3.90	2.97	3,900.00
White Bass	F	P	M		10	10.00	1.58	0.66	0.50	66.00
White Perch	E		M		7	7.00	1.11	0.05	0.03	6.43
White Crappie	S	I	C		4	4.00	0.63	0.56	0.43	140.00
Black Crappie	S	I	C		1	1.00	0.16	0.25	0.19	250.00
Rock Bass	S	C	C		1	1.00	0.16	0.14	0.11	140.00
Largemouth Bass	F	C	C		12	12.00	1.90	3.09	2.35	257.50
Green Sunfish	S	I	C	T	4	4.00	0.63	0.06	0.04	14.50
Bluegill Sunfish	S	I	C	P	31	31.00	4.91	1.66	1.26	53.51
Orangespotted Sunfish	S	I	C		5	5.00	0.79	0.04	0.03	7.60
Pumpkinseed Sunfish	S	I	C	P	4	4.00	0.63	0.09	0.07	22.50
Yellow Perch			M		14	14.00	2.22	0.11	0.08	7.86
Logperch	D	I	S	M	1	1.00	0.16	0.01	0.01	10.00
Freshwater Drum			M	P	10	10.00	1.58	1.52	1.16	152.00
<i>Mile Total</i>					631	631.00		131.53		
<i>Number of Species</i>					29					
<i>Number of Hybrids</i>					1					

## Species List

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River Code: <b>05-001</b>	Stream: <b>Sandusky River</b>	Sample Date: <b>2009</b>
River Mile: <b>1.30</b>	Location: near mouth	Date Range: 07/15/2009
Time Fished: 6250 sec	Drainage: 1335.0 sq mi	Thru: 09/01/2009
Dist Fished: 1.00 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M		1	1.00	0.21	0.02	0.01	20.00
Gizzard Shad		O	M		301	301.00	62.32	1.16	0.67	3.84
Bigmouth Buffalo	C	I	M		3	3.00	0.62	7.35	4.29	2,450.00
Smallmouth Buffalo	C	I	M		22	22.00	4.55	39.85	23.24	1,811.36
Golden Redhorse	R	I	S	M	1	1.00	0.21	0.35	0.20	350.00
Shorthead Redhorse	R	I	S	M	3	3.00	0.62	0.10	0.06	31.67
Spotted Sucker	R	I	S		1	1.00	0.21	0.59	0.34	590.00
Common Carp	G	O	M	T	53	53.00	10.97	107.65	62.77	2,031.13
Goldfish	G	O	M	T	8	8.00	1.66	2.05	1.20	256.25
Emerald Shiner	N	I	M		2	2.00	0.41	0.01	0.00	2.50
Spottail Shiner	N	I	M	P	1	1.00	0.21	0.01	0.00	6.00
Spotfin Shiner	N	I	M		7	7.00	1.45	0.08	0.05	11.57
Fathead Minnow	N	O	C	T	1	1.00	0.21	0.00	0.00	2.00
Common Carp X Goldfish	G	O		T	1	1.00	0.21	0.41	0.24	410.00
Channel Catfish	F		C		3	3.00	0.62	1.65	0.96	550.00
Yellow Bullhead		I	C	T	2	2.00	0.41	0.41	0.24	202.50
Brown Bullhead		I	C	T	1	1.00	0.21	0.06	0.03	60.00
Flathead Catfish	F	P	C		2	2.00	0.41	2.60	1.52	1,300.00
Blackstripe Topminnow		I	M		1	1.00	0.21	0.00	0.00	2.00
Brook Silverside		I	M	M	1	1.00	0.21	0.00	0.00	3.00
White Bass	F	P	M		4	4.00	0.83	0.04	0.03	11.00
White Crappie	S	I	C		1	1.00	0.21	0.14	0.08	140.00
Smallmouth Bass	F	C	C	M	1	1.00	0.21	0.01	0.00	5.00
Largemouth Bass	F	C	C		5	5.00	1.04	1.73	1.01	346.80
Green Sunfish	S	I	C	T	2	2.00	0.41	0.07	0.04	35.00
Bluegill Sunfish	S	I	C	P	16	16.00	3.31	0.64	0.37	39.69
Orangespotted Sunfish	S	I	C		3	3.00	0.62	0.03	0.02	10.00
Pumpkinseed Sunfish	S	I	C	P	13	13.00	2.69	0.41	0.24	31.15
Yellow Perch			M		9	9.00	1.86	0.16	0.09	17.22
Logperch	D	I	S	M	3	3.00	0.62	0.02	0.01	6.00
Freshwater Drum			M	P	11	11.00	2.28	3.93	2.29	356.82
<i>Mile Total</i>					483	483.00		171.50		
<i>Number of Species</i>					30					
<i>Number of Hybrids</i>					1					



# Species List

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River Code: <b>05-002</b>	Stream: <b>Bark Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>3.20</b>	Location: Kelley Rd.	Date Range: 08/11/2009
Time Fished: 1200 sec	Drainage: 10.0 sq mi	
Dist Fished: 0.12 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	3	7.50	2.17			
Goldfish	G	O	M	T	6	15.00	4.35			
Creek Chub	N	G	N	T	2	5.00	1.45			
Spotfin Shiner	N	I	M		6	15.00	4.35			
Fathead Minnow	N	O	C	T	43	107.50	31.16			
Bluntnose Minnow	N	O	C	T	65	162.50	47.10			
Yellow Bullhead		I	C	T	3	7.50	2.17			
Blackstripe Topminnow		I	M		2	5.00	1.45			
Green Sunfish	S	I	C	T	3	7.50	2.17			
Johnny Darter	D	I	C		3	7.50	2.17			
Round Goby	E				2	5.00	1.45			
<i>Mile Total</i>					138	345.00				
<i>Number of Species</i>					11					
<i>Number of Hybrids</i>					0					

River Code: <b>05-003</b>	Stream: <b>Muskellunge Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>5.40</b>	Location: Spieldenner Rd.	Date Range: 08/11/2009
Time Fished: 3600 sec	Drainage: 37.0 sq mi	Thru: 09/08/2009
Dist Fished: 0.30 km	Basin: Sandusky River	Sampler Type: E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	14	14.00	2.14	0.03	0.98	1.79
Creek Chub	N	G	N	T	123	123.00	18.84	1.33	52.01	10.81
Redfin Shiner	N	I	N		5	5.00	0.77	0.02	0.78	4.00
Common Shiner	N	I	S		28	28.00	4.29	0.14	5.40	4.93
Silverjaw Minnow	N	I	M		2	2.00	0.31	0.01	0.20	2.50
Bluntnose Minnow	N	O	C	T	67	67.00	10.26	0.17	6.65	2.54
Central Stoneroller	N	H	N		36	36.00	5.51	0.15	5.87	4.17
Yellow Bullhead		I	C	T	2	2.00	0.31	0.00	0.12	1.50
Rock Bass	S	C	C		4	4.00	0.61	0.16	6.26	40.00
Blackside Darter	D	I	S		11	11.00	1.68	0.02	0.70	1.64
Johnny Darter	D	I	C		76	76.00	11.64	0.07	2.74	0.92
Greenside Darter	D	I	S	M	81	81.00	12.40	0.20	7.82	2.47
Rainbow Darter	D	I	S	M	129	129.00	19.75	0.16	6.18	1.22
Fantail Darter	D	I	C		75	75.00	11.49	0.11	4.30	1.47
<i>Mile Total</i>					653	653.00		2.56		
<i>Number of Species</i>					14					
<i>Number of Hybrids</i>					0					

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River Code: <b>05-003</b>	Stream: <b>Muskellunge Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>0.80</b>	Location: upst. St. Rt. 53	Date Range: 07/20/2009
Time Fished: 8766 sec	Drainage: 46.0 sq mi	Thru: 08/26/2009
Dist Fished: 1.00 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M		1	1.00	0.17	0.02	0.02	20.00
Gizzard Shad		O	M		328	328.00	54.76	1.11	1.22	3.37
Northern Pike	F	P	M		1	1.00	0.17	1.20	1.32	1,200.00
Smallmouth Buffalo	C	I	M		6	6.00	1.00	11.05	12.15	1,841.67
Quillback	C	O	M		3	3.00	0.50	1.55	1.70	516.67
Silver Redhorse	R	I	S	M	6	6.00	1.00	6.91	7.60	1,152.17
Black Redhorse	R	I	S	I	2	2.00	0.33	0.10	0.11	50.00
Golden Redhorse	R	I	S	M	31	31.00	5.18	5.80	6.38	187.10
Shorthead Redhorse	R	I	S	M	1	1.00	0.17	0.24	0.26	240.00
Greater Redhorse [T]	R	I	S	R	9	9.00	1.50	5.17	5.69	574.44
White Sucker	W	O	S	T	4	4.00	0.67	0.48	0.53	121.00
Spotted Sucker	R	I	S		48	48.00	8.01	7.05	7.75	146.88
Common Carp	G	O	M	T	21	21.00	3.51	33.64	36.99	1,601.90
Goldfish	G	O	M	T	18	18.00	3.01	5.01	5.51	278.47
Golden Shiner	N	I	M	T	4	4.00	0.67	0.03	0.03	6.25
Emerald Shiner	N	I	M		18	18.00	3.01	0.06	0.06	3.22
Spotfin Shiner	N	I	M		5	5.00	0.83	0.01	0.01	2.00
Common Carp X Goldfish	G	O		T	2	2.00	0.33	1.30	1.43	650.00
Channel Catfish	F		C		1	1.00	0.17	0.75	0.82	750.00
Yellow Bullhead		I	C	T	1	1.00	0.17	0.16	0.18	160.00
Brown Bullhead		I	C	T	3	3.00	0.50	0.61	0.67	201.67
White Bass	F	P	M		3	3.00	0.50	0.02	0.02	5.33
White Perch	E		M		6	6.00	1.00	0.04	0.04	6.33
Rock Bass	S	C	C		4	4.00	0.67	0.22	0.24	54.50
Largemouth Bass	F	C	C		14	14.00	2.34	5.87	6.45	418.93
Green Sunfish	S	I	C	T	11	11.00	1.84	0.23	0.26	21.09
Bluegill Sunfish	S	I	C	P	22	22.00	3.67	0.98	1.08	44.50
Orangespotted Sunfish	S	I	C		3	3.00	0.50	0.02	0.02	6.67
Pumpkinseed Sunfish	S	I	C	P	2	2.00	0.33	0.05	0.05	25.00
Green Sf X Bluegill Sf					1	1.00	0.17	0.11	0.12	110.00
Yellow Perch			M		11	11.00	1.84	0.35	0.38	31.45
Logperch	D	I	S	M	3	3.00	0.50	0.02	0.02	7.33
Freshwater Drum			M	P	6	6.00	1.00	0.80	0.88	133.33
<i>Mile Total</i>					599	599.00		90.94		
<i>Number of Species</i>					31					
<i>Number of Hybrids</i>					2					

River Code: <b>05-044</b>	Stream: <b>South Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>7.90</b>	Location: Co. Rd. 229	Date Range: 08/04/2009
Time Fished: 3081 sec	Drainage: 7.1 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	41	82.00	9.65			
Western Blacknose Dace	N	G	S	T	91	182.00	21.41			
Creek Chub	N	G	N	T	103	206.00	24.24			
Common Shiner	N	I	S		13	26.00	3.06			
Bluntnose Minnow	N	O	C	T	146	292.00	34.35			
Central Stoneroller	N	H	N		31	62.00	7.29			
<i>Mile Total</i>					425	850.00				
<i>Number of Species</i>					6					
<i>Number of Hybrids</i>					0					

River Code: <b>05-044</b>	Stream: <b>South Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>4.00</b>	Location: Whitmore Rd.	Date Range: 08/18/2009
Time Fished: 957 sec	Drainage: 18.1 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M		16	32.00	8.79			
Northern Pike	F	P	M		1	2.00	0.55			
White Sucker	W	O	S	T	22	44.00	12.09			
Creek Chub	N	G	N	T	12	24.00	6.59			
Common Shiner	N	I	S		9	18.00	4.95			
Spotfin Shiner	N	I	M		1	2.00	0.55			
Silverjaw Minnow	N	I	M		1	2.00	0.55			
Fathead Minnow	N	O	C	T	47	94.00	25.82			
Bluntnose Minnow	N	O	C	T	16	32.00	8.79			
Central Stoneroller	N	H	N		6	12.00	3.30			
Yellow Bullhead		I	C	T	3	6.00	1.65			
Brown Bullhead		I	C	T	2	4.00	1.10			
Blackstripe Topminnow		I	M		2	4.00	1.10			
Green Sunfish	S	I	C	T	17	34.00	9.34			
Yellow Perch			M		15	30.00	8.24			
Logperch	D	I	S	M	3	6.00	1.65			
Round Goby	E				9	18.00	4.95			
<i>Mile Total</i>					182	364.00				
<i>Number of Species</i>					17					
<i>Number of Hybrids</i>					0					

River Code: <b>05-045</b>	Stream: <b>Raccoon Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>13.30</b>	Location: Limerick Rd.	Date Range: 08/04/2009
Time Fished: 2932 sec	Drainage: 8.9 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Central Mudminnow		I	C	T	1	2.00	0.13	0.00	0.04	2.00
White Sucker	W	O	S	T	43	86.00	5.66	2.69	26.39	31.26
Western Blacknose Dace	N	G	S	T	72	144.00	9.47	0.35	3.48	2.46
Creek Chub	N	G	N	T	398	796.00	52.37	5.16	50.65	6.48
Common Shiner	N	I	S		61	122.00	8.03	1.02	10.02	8.37
Bluntnose Minnow	N	O	C	T	6	12.00	0.79	0.04	0.37	3.20
Central Stoneroller	N	H	N		122	244.00	16.05	0.60	5.84	2.44
Largemouth Bass	F	C	C		2	4.00	0.26	0.03	0.31	8.00
Green Sunfish	S	I	C	T	2	4.00	0.26	0.08	0.79	20.00
Bluegill Sunfish	S	I	C	P	1	2.00	0.13	0.02	0.24	12.00
Green Sf X Hybrid					1	2.00	0.13	0.04	0.35	18.00
Johnny Darter	D	I	C		51	102.00	6.71	0.15	1.51	1.51
<i>Mile Total</i>					760	1,520.00		10.19		
<i>Number of Species</i>					11					
<i>Number of Hybrids</i>					1					

River Code: <b>05-045</b>	Stream: <b>Raccoon Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>11.30</b>	Location: U.S. Rt. 20	Date Range: 08/04/2009
Time Fished: 1595 sec	Drainage: 11.3 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Central Mudminnow		I	C	T	1	2.00	0.16			
White Sucker	W	O	S	T	58	116.00	9.43			
Western Blacknose Dace	N	G	S	T	1	2.00	0.16			
Creek Chub	N	G	N	T	136	272.00	22.11			
Common Shiner	N	I	S		83	166.00	13.50			
Bluntnose Minnow	N	O	C	T	37	74.00	6.02			
Central Stoneroller	N	H	N		239	478.00	38.86			
Yellow Bullhead		I	C	T	3	6.00	0.49			
Largemouth Bass	F	C	C		7	14.00	1.14			
Green Sunfish	S	I	C	T	17	34.00	2.76			
Johnny Darter	D	I	C		33	66.00	5.37			
<i>Mile Total</i>					615	1,230.00				
<i>Number of Species</i>					11					
<i>Number of Hybrids</i>					0					

River Code: <b>05-045</b>	Stream: <b>Raccoon Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>10.20</b>	Location: Twp. Rd. 223	Date Range: 06/29/2009
Time Fished: 1487 sec	Drainage: 12.2 sq mi	
Dist Fished: 0.20 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	59	88.50	4.72	0.62	4.52	7.04
Common Carp	G	O	M	T	2	3.00	0.16	2.66	19.33	887.50
Western Blacknose Dace	N	G	S	T	59	88.50	4.72	0.21	1.55	2.42
Creek Chub	N	G	N	T	180	270.00	14.40	3.49	25.30	12.91
Suckermouth Minnow	N	I	S		2	3.00	0.16	0.03	0.20	9.00
Common Shiner	N	I	S		58	87.00	4.64	0.93	6.77	10.72
Silverjaw Minnow	N	I	M		38	57.00	3.04	0.15	1.08	2.61
Bluntnose Minnow	N	O	C	T	192	288.00	15.36	1.16	8.43	4.03
Central Stoneroller	N	H	N		625	937.50	50.00	3.84	27.86	4.09
Yellow Bullhead		I	C	T	7	10.50	0.56	0.53	3.83	50.29
Green Sunfish	S	I	C	T	1	1.50	0.08	0.03	0.21	19.00
Logperch	D	I	S	M	6	9.00	0.48	0.09	0.65	10.00
Johnny Darter	D	I	C		21	31.50	1.68	0.04	0.28	1.25
<i>Mile Total</i>					1,250	1,875.00		13.78		
<i>Number of Species</i>					13					
<i>Number of Hybrids</i>					0					



River Code: <b>05-045</b>	Stream: <b>Raccoon Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>5.40</b>	Location: Twp. Rd. 244 (Karbler Rd.)	Date Range: 08/05/2009
Time Fished: 4331 sec	Drainage: 22.5 sq mi	Thru: 09/15/2009
Dist Fished: 0.35 km	Basin: Sandusky River	Sampler Type: D E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M	8	7.00	1.02	0.09	0.81	12.63
White Sucker	W	O	S T	71	53.75	7.82	2.52	22.49	46.86
Goldfish	G	O	M T	1	0.75	0.11	0.03	0.26	39.00
Western Blacknose Dace	N	G	S T	53	43.50	6.33	0.16	1.39	3.60
Creek Chub	N	G	N T	375	292.50	42.58	6.39	57.13	21.30
Suckermouth Minnow	N	I	S	12	9.00	1.31	0.05	0.41	5.08
Common Shiner	N	I	S	70	53.25	7.75	0.54	4.81	10.22
Spotfin Shiner	N	I	M	1	0.75	0.11	0.00	0.01	2.00
Silverjaw Minnow	N	I	M	1	1.00	0.15	0.00	0.02	2.00
Bluntnose Minnow	N	O	C T	5	3.75	0.55	0.04	0.32	9.40
Central Stoneroller	N	H	N	79	64.25	9.35	0.50	4.47	7.60
Yellow Bullhead		I	C T	1	0.75	0.11	0.05	0.42	62.00
Western Mosquitofish	E	I	N	3	2.50	0.36	0.00	0.03	1.33
Largemouth Bass	F	C	C	1	0.75	0.11	0.01	0.07	10.00
Green Sunfish	S	I	C T	16	14.00	2.04	0.15	1.33	11.09
Bluegill Sunfish	S	I	C P	3	2.75	0.40	0.03	0.29	12.33
Yellow Perch			M	6	4.50	0.66	0.04	0.38	9.50
Logperch	D	I	S M	9	7.25	1.06	0.05	0.46	6.89
Johnny Darter	D	I	C	1	1.00	0.15	0.00	0.02	2.00
Round Goby	E			142	124.00	18.05	0.55	4.89	4.54
<i>Mile Total</i>				858	687.00		11.18		
<i>Number of Species</i>				20					
<i>Number of Hybrids</i>				0					

River Code: <b>05-046</b>	Stream: <b>Pickrel Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>6.30</b>	Location: Twp. Rd. 233 (Reinicke Rd.)	Date Range: 08/05/2009
Time Fished: 946 sec	Drainage: 9.5 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	66	132.00	11.19			
Western Blacknose Dace	N	G	S	T	61	122.00	10.34			
Creek Chub	N	G	N	T	297	594.00	50.34			
Common Shiner	N	I	S		74	148.00	12.54			
Silverjaw Minnow	N	I	M		3	6.00	0.51			
Bluntnose Minnow	N	O	C	T	6	12.00	1.02			
Central Stoneroller	N	H	N		30	60.00	5.08			
Common Sh X Creek Chub					1	2.00	0.17			
Johnny Darter	D	I	C		36	72.00	6.10			
Brook Stickleback		I	C		16	32.00	2.71			
<i>Mile Total</i>					590	1,180.00				
<i>Number of Species</i>					9					
<i>Number of Hybrids</i>					1					

River Code: <b>05-046</b>	Stream: <b>Pickrel Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>3.30</b>	Location: Twp. Rd. 247	Date Range: 07/08/2009
Time Fished: 4171 sec	Drainage: 19.9 sq mi	Thru: 08/12/2009
Dist Fished: 0.40 km	Basin: Sandusky River	Sampler Type: E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Rainbow Trout	E		N		2	1.50	0.18	0.71	1.55	471.00
White Sucker	W	O	S	T	497	372.75	45.76	40.70	89.20	109.18
Common Carp	G	O	M	T	1	0.75	0.09	0.38	0.82	500.00
Goldfish	G	O	M	T	1	0.75	0.09	0.03	0.06	35.00
Western Blacknose Dace	N	G	S	T	93	69.75	8.56	0.31	0.67	4.41
Creek Chub	N	G	N	T	192	144.00	17.68	1.55	3.39	10.74
Common Shiner	N	I	S		126	94.50	11.60	1.00	2.19	10.57
Silverjaw Minnow	N	I	M		1	0.75	0.09	0.00	0.01	3.00
Bluntnose Minnow	N	O	C	T	4	3.00	0.37	0.01	0.01	2.00
Central Stoneroller	N	H	N		92	69.00	8.47	0.63	1.38	9.12
Black Bullhead		I	C	P	1	0.75	0.09	0.06	0.14	84.00
Green Sunfish	S	I	C	T	2	1.50	0.18	0.02	0.04	12.00
Logperch	D	I	S	M	1	0.75	0.09	0.01	0.03	15.00
Johnny Darter	D	I	C		9	6.75	0.83	0.01	0.02	1.22
Round Goby	E				62	46.50	5.71	0.23	0.50	4.86
Brook Stickleback		I	C		2	1.50	0.18	0.00	0.01	2.00
<i>Mile Total</i>					1,086	814.50		45.63		
<i>Number of Species</i>					16					
<i>Number of Hybrids</i>					0					

River Code: <b>05-049</b>	Stream: <b>Little Pickerel Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>2.10</b>	Location: Yetter Rd.	Date Range: 08/05/2009
Time Fished: 1940 sec	Drainage: 5.3 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNr status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Brown Trout	E		N		26	52.00	16.67			
Rainbow Trout	E		N		3	6.00	1.92			
White Sucker	W	O	S	T	72	144.00	46.15			
Common Carp	G	O	M	T	4	8.00	2.56			
Creek Chub	N	G	N	T	2	4.00	1.28			
Black Bullhead		I	C	P	1	2.00	0.64			
Pumpkinseed Sunfish	S	I	C	P	1	2.00	0.64			
Round Goby	E				13	26.00	8.33			
Mottled Sculpin		I	C		34	68.00	21.79			
<i>Mile Total</i>					156	312.00				
<i>Number of Species</i>					9					
<i>Number of Hybrids</i>					0					

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River Code: <b>05-050</b>	Stream: <b>Cold Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>0.50</b>	Location: adj. U.S. Rt. 6	Date Range: 08/05/2009
Time Fished: 2005 sec	Drainage: 2.9 sq mi	
Dist Fished: 0.20 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Brown Trout	E		N		50	75.00	37.04	21.71	53.81	289.52
Rainbow Trout	E		N		16	24.00	11.85	12.74	31.56	530.77
Brook Trout [T]			N		1	1.50	0.74	0.30	0.74	200.00
White Sucker	W	O	S	T	5	7.50	3.70	5.10	12.64	680.00
Mottled Sculpin		I	C		63	94.50	46.67	0.50	1.25	5.33
<i>Mile Total</i>					135	202.50		40.36		
<i>Number of Species</i>					5					
<i>Number of Hybrids</i>					0					

River Code: <b>05-051</b>	Stream: <b>Mills Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>10.40</b>	Location: Portland Rd.	Date Range: 07/08/2009
Time Fished: 5824 sec	Drainage: 21.0 sq mi	Thru: 08/12/2009
Dist Fished: 0.40 km	Basin: Sandusky River	Sampler Type: E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	141	105.75	25.82	4.76	51.23	45.03
Creek Chub	N	G	N	T	91	68.25	16.67	2.25	24.19	32.94
Fathead Minnow	N	O	C	T	6	4.50	1.10	0.02	0.24	5.00
Bluntnose Minnow	N	O	C	T	10	7.50	1.83	0.04	0.40	5.00
Central Stoneroller	N	H	N		291	218.25	53.30	2.05	22.00	9.37
Green Sunfish	S	I	C	T	4	3.00	0.73	0.13	1.40	43.25
Pumpkinseed Sunfish	S	I	C	P	1	0.75	0.18	0.05	0.53	65.00
Blackside Darter	D	I	S		1	0.75	0.18	0.00	0.01	1.00
Johnny Darter	D	I	C		1	0.75	0.18	0.00	0.02	2.00
<i>Mile Total</i>					546	409.50		9.30		
<i>Number of Species</i>					9					
<i>Number of Hybrids</i>					0					

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River Code: <b>05-051</b>	Stream: <b>Mills Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>6.00</b>	Location: St. Rt. 99	Date Range: 07/08/2009
Time Fished: 4161 sec	Drainage: 29.0 sq mi	Thru: 08/12/2009
Dist Fished: 0.40 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	176	132.00	14.93	0.93	33.29	7.08
Common Carp	G	O	M	T	7	5.25	0.59	0.05	1.75	9.29
Creek Chub	N	G	N	T	57	42.75	4.83	0.50	17.78	11.67
Fathead Minnow	N	O	C	T	9	6.75	0.76	0.02	0.69	2.89
Bluntnose Minnow	N	O	C	T	140	105.00	11.87	0.24	8.68	2.32
Central Stoneroller	N	H	N		755	566.25	64.04	1.01	35.92	1.78
Johnny Darter	D	I	C		35	26.25	2.97	0.05	1.94	2.06
<i>Mile Total</i>					1,179	884.25		2.81		
<i>Number of Species</i>					7					
<i>Number of Hybrids</i>					0					

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River Code: <b>05-051</b>	Stream: <b>Mills Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>5.20</b>	Location: Bogart Rd.	Date Range: 07/07/2009
Time Fished: 3474 sec	Drainage: 29.0 sq mi	Thru: 08/17/2009
Dist Fished: 0.40 km	Basin: Sandusky River	Sampler Type: D
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	1	0.75	0.11	0.05	0.33	65.00
White Sucker	W	O	S	T	256	192.00	27.86	5.08	34.25	26.47
Common Carp	G	O	M	T	28	21.00	3.05	3.24	21.80	154.04
Western Blacknose Dace	N	G	S	T	1	0.75	0.11	0.00	0.01	2.00
Creek Chub	N	G	N	T	158	118.50	17.19	4.65	31.35	39.25
Fathead Minnow	N	O	C	T	2	1.50	0.22	0.00	0.02	2.00
Bluntnose Minnow	N	O	C	T	65	48.75	7.07	0.14	0.91	2.76
Central Stoneroller	N	H	N		358	268.50	38.96	1.50	10.13	5.60
Yellow Bullhead		I	C	T	1	0.75	0.11	0.06	0.37	74.00
Green Sunfish	S	I	C	T	1	0.75	0.11	0.03	0.19	38.00
Bluegill Sunfish	S	I	C	P	3	2.25	0.33	0.06	0.38	25.33
Johnny Darter	D	I	C		45	33.75	4.90	0.04	0.25	1.10
<i>Mile Total</i>					919	689.25		14.84		
<i>Number of Species</i>					12					
<i>Number of Hybrids</i>					0					



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River Code: <b>05-051</b>	Stream: <b>Mills Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>3.70</b>	Location: Strub Rd.	Date Range: 07/07/2009
Time Fished: 5141 sec	Drainage: 35.0 sq mi	Thru: 08/17/2009
Dist Fished: 0.40 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	894	670.50	39.88	7.71	50.21	11.50
Common Carp	G	O	M	T	16	12.00	0.71	0.48	3.10	39.63
Goldfish	G	O	M	T	8	6.00	0.36	0.02	0.10	2.50
Creek Chub	N	G	N	T	137	102.75	6.11	2.40	15.66	23.39
Common Shiner	N	I	S		1	0.75	0.04	0.00	0.01	2.00
Spotfin Shiner	N	I	M		2	1.50	0.09	0.00	0.03	3.00
Fathead Minnow	N	O	C	T	13	9.75	0.58	0.04	0.23	3.64
Bluntnose Minnow	N	O	C	T	198	148.50	8.83	0.44	2.86	2.96
Central Stoneroller	N	H	N		676	507.00	30.15	3.08	20.04	6.07
Yellow Bullhead		I	C	T	10	7.50	0.45	0.29	1.88	38.50
Brown Bullhead		I	C	T	2	1.50	0.09	0.08	0.52	53.50
Black Bullhead		I	C	P	2	1.50	0.09	0.11	0.74	75.00
Green Sunfish	S	I	C	T	10	7.50	0.45	0.13	0.82	16.70
Bluegill Sunfish	S	I	C	P	6	4.50	0.27	0.08	0.50	17.00
Hybrid X Sunfish					1	0.75	0.04	0.02	0.11	22.00
Logperch	D	I	S	M	2	1.50	0.09	0.02	0.14	14.50
Johnny Darter	D	I	C		199	149.25	8.88	0.16	1.07	1.10
Round Goby	E				65	48.75	2.90	0.31	2.00	6.30
<i>Mile Total</i>					2,242	1,681.50		15.35		
<i>Number of Species</i>					17					
<i>Number of Hybrids</i>					1					

River Code: <b>05-051</b>	Stream: <b>Mills Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>1.30</b>	Location: Perkins Rd.	Date Range: 07/07/2009
Time Fished: 2527 sec	Drainage: 41.0 sq mi	Thru: 09/09/2009
Dist Fished: 0.37 km	Basin: Sandusky River	Sampler Type: D
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	100	76.32	23.44	0.73	23.14	9.51
Spotted Sucker	R	I	S		1	0.75	0.23	0.02	0.48	20.00
Goldfish	G	O	M	T	2	1.63	0.50	0.39	12.42	239.50
Creek Chub	N	G	N	T	40	30.40	9.33	0.62	19.70	20.40
Emerald Shiner	N	I	M		2	1.50	0.46	0.02	0.71	15.00
Spotfin Shiner	N	I	M		4	3.00	0.92	0.02	0.48	5.00
Fathead Minnow	N	O	C	T	19	14.38	4.42	0.05	1.73	3.79
Bluntnose Minnow	N	O	C	T	131	101.96	31.31	0.25	8.05	2.49
Central Stoneroller	N	H	N		46	35.82	11.00	0.25	8.06	7.15
Yellow Bullhead		I	C	T	3	2.65	0.81	0.39	12.32	147.00
Largemouth Bass	F	C	C		1	0.75	0.23	0.01	0.29	12.00
Green Sunfish	S	I	C	T	8	6.00	1.84	0.09	2.98	15.63
Bluegill Sunfish	S	I	C	P	1	0.88	0.27	0.02	0.70	25.00
Green Sf X Bluegill Sf					3	2.25	0.69	0.12	3.93	55.00
Johnny Darter	D	I	C		7	5.91	1.82	0.01	0.24	1.29
Round Goby	E				51	41.43	12.72	0.15	4.80	3.58
<i>Mile Total</i>					419	325.63		3.16		
<i>Number of Species</i>					15					
<i>Number of Hybrids</i>					1					

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River Code: <b>05-052</b>	Stream: <b>Pipe Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>8.20</b>	Location: Patten Tract Rd.	Date Range: 08/06/2009
Time Fished: 1800 sec	Drainage: 14.7 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	61	122.00	7.54			
Creek Chub	N	G	N	T	256	512.00	31.64			
Fathead Minnow	N	O	C	T	14	28.00	1.73			
Bluntnose Minnow	N	O	C	T	315	630.00	38.94			
Central Stoneroller	N	H	N		143	286.00	17.68			
Largemouth Bass	F	C	C		16	32.00	1.98			
Logperch	D	I	S	M	4	8.00	0.49			
<i>Mile Total</i>					809	1,618.00				
<i>Number of Species</i>					7					
<i>Number of Hybrids</i>					0					

River Code: <b>05-052</b>	Stream: <b>Pipe Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>6.70</b>	Location: upst. Schenk Rd.	Date Range: 08/11/2009
Time Fished: 1800 sec	Drainage: 18.4 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	112	224.00	17.83			
Creek Chub	N	G	N	T	49	98.00	7.80			
Common Shiner	N	I	S		12	24.00	1.91			
Sand Shiner	N	I	M	M	1	2.00	0.16			
Fathead Minnow	N	O	C	T	18	36.00	2.87			
Bluntnose Minnow	N	O	C	T	301	602.00	47.93			
Central Stoneroller	N	H	N		95	190.00	15.13			
Largemouth Bass	F	C	C		12	24.00	1.91			
Green Sunfish	S	I	C	T	4	8.00	0.64			
Blackside Darter	D	I	S		4	8.00	0.64			
Logperch	D	I	S	M	20	40.00	3.18			
<i>Mile Total</i>					628	1,256.00				
<i>Number of Species</i>					11					
<i>Number of Hybrids</i>					0					

River Code: <b>05-052</b>	Stream: <b>Pipe Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>2.30</b>	Location: Columbus Ave.	Date Range: 07/07/2009
Time Fished: 3753 sec	Drainage: 22.8 sq mi	Thru: 08/11/2009
Dist Fished: 0.40 km	Basin: Sandusky River	Sampler Type: E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	2	1.50	0.75	0.07	5.89	49.00
White Sucker	W	O	S	T	25	18.75	9.43	0.09	7.18	4.76
Goldfish	G	O	M	T	3	2.25	1.13	0.44	35.57	197.00
Western Blacknose Dace	N	G	S	T	1	0.75	0.38	0.00	0.12	2.00
Creek Chub	N	G	N	T	15	11.25	5.66	0.12	9.58	10.60
Fathead Minnow	N	O	C	T	15	11.25	5.66	0.03	2.21	2.45
Bluntnose Minnow	N	O	C	T	49	36.75	18.49	0.07	5.89	2.00
Central Stoneroller	N	H	N		139	104.25	52.45	0.18	14.39	1.72
Largemouth Bass	F	C	C		16	12.00	6.04	0.24	19.25	20.00
<i>Mile Total</i>					265	198.75		1.25		
<i>Number of Species</i>					9					
<i>Number of Hybrids</i>					0					

## Species List

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River Code: <b>05-054</b>	Stream: <b>Buck Run</b>	Sample Date: <b>2009</b>
River Mile: <b>0.20</b>	Location: Twp. Rd. 233	Date Range: 08/04/2009
Time Fished: 2176 sec	Drainage: 4.5 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	95	190.00	13.18			
Western Blacknose Dace	N	G	S	T	94	188.00	13.04			
Creek Chub	N	G	N	T	262	524.00	36.34			
Common Shiner	N	I	S		1	2.00	0.14			
Bluntnose Minnow	N	O	C	T	13	26.00	1.80			
Central Stoneroller	N	H	N		159	318.00	22.05			
Johnny Darter	D	I	C		97	194.00	13.45			
<i>Mile Total</i>					721	1,442.00				
<i>Number of Species</i>					7					
<i>Number of Hybrids</i>					0					

# Species List

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River Code: <b>05-058</b>	Stream: <b>Caswell Ditch</b>	Sample Date: <b>2009</b>
River Mile: <b>0.90</b>	Location: Bogart Rd.	Date Range: 07/17/2009
Time Fished: 5535 sec	Drainage: 3.9 sq mi	Thru: 08/12/2009
Dist Fished: 0.35 km	Basin: Sandusky River	Sampler Type: E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	222	184.50	13.77	1.18	28.89	5.26
Creek Chub	N	G	N	T	31	29.25	2.18	0.02	0.39	1.50
Fathead Minnow	N	O	C	T	708	555.75	41.47	1.74	42.40	1.90
Bluntnose Minnow	N	O	C	T	337	284.00	21.19	0.76	18.61	2.40
Central Stoneroller	N	H	N		198	184.75	13.78	0.21	5.07	2.62
Green Sunfish	S	I	C	T	5	4.25	0.32	0.08	1.90	17.33
Green Sf X Hybrid					1	1.00	0.07			
Johnny Darter	D	I	C		120	96.75	7.22	0.11	2.73	0.80
<i>Mile Total</i>					1,622	1,340.25		4.10		
<i>Number of Species</i>					7					
<i>Number of Hybrids</i>					1					

River Code: <b>05-100</b>	Stream: <b>Green Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>18.90</b>	Location: upst. Co. Rd. 34	Date Range: 08/04/2009
Time Fished: 1800 sec	Drainage: 19.9 sq mi	
Dist Fished: 0.20 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	17	25.50	6.39	1.76	17.78	69.06
Common Carp	G	O	M	T	9	13.50	3.38	4.44	44.79	328.57
Western Blacknose Dace	N	G	S	T	19	28.50	7.14	0.18	1.82	6.32
Creek Chub	N	G	N	T	54	81.00	20.30	2.19	22.15	27.08
Common Shiner	N	I	S		1	1.50	0.38	0.04	0.38	25.00
Bluntnose Minnow	N	O	C	T	7	10.50	2.63	0.03	0.25	2.33
Green Sunfish	S	I	C	T	3	4.50	1.13	0.09	0.91	20.00
Johnny Darter	D	I	C		3	4.50	1.13	0.01	0.12	2.67
Rainbow Darter	D	I	S	M	6	9.00	2.26	0.03	0.30	3.33
Mottled Sculpin		I	C		147	220.50	55.26	1.14	11.51	5.17
<i>Mile Total</i>					266	399.00		9.91		
<i>Number of Species</i>					10					
<i>Number of Hybrids</i>					0					



River Code: <b>05-100</b>	Stream: <b>Green Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>18.80</b>	Location: Co. Rd. 34	Date Range: 07/01/2009
Time Fished: 3615 sec	Drainage: 19.9 sq mi	
Dist Fished: 0.20 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I	S	M	1	1.50	0.44	0.15	4.02	102.00
White Sucker	W	O	S	T	5	7.50	2.18	0.56	14.58	74.00
Western Blacknose Dace	N	G	S	T	40	60.00	17.47	0.36	9.46	6.00
Creek Chub	N	G	N	T	35	52.50	15.28	1.10	29.01	21.03
Common Shiner	N	I	S		14	21.00	6.11	0.27	7.07	12.79
Fathead Minnow	N	O	C	T	2	3.00	0.87	0.01	0.16	2.00
Central Stoneroller	N	H	N		16	24.00	6.99	0.26	6.91	10.94
Brown Bullhead		I	C	T	1	1.50	0.44	0.12	3.13	79.00
Green Sunfish	S	I	C	T	5	7.50	2.18	0.11	2.81	14.20
Johnny Darter	D	I	C		1	1.50	0.44	0.00	0.08	2.00
Greenside Darter	D	I	S	M	1	1.50	0.44	0.03	0.68	17.00
Rainbow Darter	D	I	S	M	8	12.00	3.49	0.04	0.95	3.00
Mottled Sculpin		I	C		100	150.00	43.67	0.81	21.20	5.38
<i>Mile Total</i>					229	343.50		3.81		
<i>Number of Species</i>					13					
<i>Number of Hybrids</i>					0					

River Code: <b>05-100</b>	Stream: <b>Green Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>11.10</b>	Location: Co. Rd. 198	Date Range: 08/05/2009
Time Fished: 3762 sec	Drainage: 19.9 sq mi	Thru: 09/10/2009
Dist Fished: 0.40 km	Basin: Sandusky River	Sampler Type: D
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	1	0.75	0.41	0.06	0.27	80.00
Northern Hog Sucker	R	I	S	M	6	4.50	2.49	0.41	1.82	90.00
White Sucker	W	O	S	T	76	57.00	31.54	2.08	9.34	36.50
Common Carp	G	O	M	T	13	9.75	5.39	17.36	77.95	1,780.77
Western Blacknose Dace	N	G	S	T	5	3.75	2.07	0.02	0.08	4.80
Creek Chub	N	G	N	T	104	78.00	43.15	1.88	8.42	24.04
Common Shiner	N	I	S		7	5.25	2.90	0.08	0.34	14.29
Black Bullhead		I	C	P	1	0.75	0.41	0.03	0.13	40.00
Rock Bass	S	C	C		1	0.75	0.41	0.18	0.81	240.00
Largemouth Bass	F	C	C		1	0.75	0.41	0.00	0.02	5.00
Green Sunfish	S	I	C	T	2	1.50	0.83	0.05	0.24	35.00
Blackside Darter	D	I	S		2	1.50	0.83	0.02	0.07	10.00
Johnny Darter	D	I	C		6	4.50	2.49	0.01	0.06	3.00
Greenside Darter	D	I	S	M	2	1.50	0.83	0.01	0.03	5.00
Rainbow Darter	D	I	S	M	3	2.25	1.24	0.01	0.04	3.67
Mottled Sculpin		I	C		11	8.25	4.56	0.09	0.39	10.45
<i>Mile Total</i>					241	180.75		22.27		
<i>Number of Species</i>					16					
<i>Number of Hybrids</i>					0					

River Code: <b>05-100</b>	Stream: <b>Green Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>9.00</b>	Location: dst. Co. Rd. 229	Date Range: 08/04/2009
Time Fished: 5890 sec	Drainage: 19.9 sq mi	Thru: 09/10/2009
Dist Fished: 0.40 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M		3	2.25	0.67	0.05	0.46	23.33
Golden Redhorse	R	I	S	M	1	0.75	0.22	0.02	0.20	30.00
Northern Hog Sucker	R	I	S	M	44	33.00	9.89	2.07	18.28	62.61
White Sucker	W	O	S	T	58	43.50	13.03	3.30	29.20	75.86
Common Carp	G	O	M	T	1	0.75	0.22	0.45	3.98	600.00
Western Blacknose Dace	N	G	S	T	29	21.75	6.52	0.12	1.10	5.71
Creek Chub	N	G	N	T	160	120.00	35.96	4.27	37.74	35.54
Common Shiner	N	I	S		1	0.75	0.22	0.02	0.20	30.00
Spotfin Shiner	N	I	M		11	8.25	2.47	0.05	0.40	5.45
Silverjaw Minnow	N	I	M		1	0.75	0.22	0.00	0.02	3.00
Fathead Minnow	N	O	C	T	3	2.25	0.67	0.02	0.15	7.67
Central Stoneroller	N	H	N		43	32.25	9.66	0.53	4.68	16.40
White Crappie	S	I	C		1	0.75	0.22	0.06	0.53	80.00
Rock Bass	S	C	C		1	0.75	0.22	0.02	0.15	23.00
Largemouth Bass	F	C	C		1	0.75	0.22	0.02	0.20	30.00
Green Sunfish	S	I	C	T	1	0.75	0.22	0.03	0.27	40.00
Logperch	D	I	S	M	8	6.00	1.80	0.06	0.53	10.00
Johnny Darter	D	I	C		20	15.00	4.49	0.02	0.21	1.57
Greenside Darter	D	I	S	M	7	5.25	1.57	0.02	0.20	4.29
Rainbow Darter	D	I	S	M	19	14.25	4.27	0.04	0.31	2.47
Mottled Sculpin		I	C		32	24.00	7.19	0.14	1.19	5.63
<i>Mile Total</i>					445	333.75		11.30		
<i>Number of Species</i>					21					
<i>Number of Hybrids</i>					0					

River Code: <b>05-100</b>	Stream: <b>Green Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>3.90</b>	Location: U.S. Rt. 6	Date Range: 08/04/2009
Time Fished: 3980 sec	Drainage: 19.9 sq mi	Thru: 09/10/2009
Dist Fished: 0.40 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M		218	163.50	65.07	2.05	27.18	12.52
Golden Redhorse	R	I	S	M	1	0.75	0.30	0.05	0.70	70.00
Shorthead Redhorse	R	I	S	M	4	3.00	1.19	0.15	1.99	50.00
Northern Hog Sucker	R	I	S	M	1	0.75	0.30	0.04	0.50	50.00
White Sucker	W	O	S	T	22	16.50	6.57	1.99	26.38	120.45
Common Carp	G	O	M	T	3	2.25	0.90	0.88	11.65	390.00
Goldfish	G	O	M	T	1	0.75	0.30	0.30	3.98	400.00
Creek Chub	N	G	N	T	1	0.75	0.30	0.00	0.03	3.00
Suckermouth Minnow	N	I	S		1	0.75	0.30	0.00	0.04	4.00
Emerald Shiner	N	I	M		3	2.25	0.90	0.02	0.20	6.67
Spottail Shiner	N	I	M	P	2	1.50	0.60	0.02	0.20	10.00
Spotfin Shiner	N	I	M		15	11.25	4.48	0.03	0.40	2.67
Fathead Minnow	N	O	C	T	1	0.75	0.30	0.00	0.04	4.00
Bluntnose Minnow	N	O	C	T	1	0.75	0.30	0.00	0.04	4.00
Central Stoneroller	N	H	N		1	0.75	0.30	0.00	0.04	4.00
Yellow Bullhead		I	C	T	1	0.75	0.30	0.20	2.59	260.00
Brindled Madtom		I	C	I	1	0.75	0.30	0.02	0.30	30.00
Rock Bass	S	C	C		9	6.75	2.69	0.78	10.35	115.56
Green Sunfish	S	I	C	T	8	6.00	2.39	0.08	1.10	13.75
Yellow Perch			M		2	1.50	0.60	0.06	0.80	40.00
Logperch	D	I	S	M	2	1.50	0.60	0.02	0.20	10.00
Johnny Darter	D	I	C		6	4.50	1.79	0.01	0.10	1.67
Greenside Darter	D	I	S	M	2	1.50	0.60	0.01	0.08	4.00
Freshwater Drum			M	P	1	0.75	0.30	0.68	8.96	900.00
Round Goby	E				18	13.50	5.37	0.06	0.83	4.63
Mottled Sculpin		I	C		10	7.50	2.99	0.10	1.35	13.50
<i>Mile Total</i>					335	251.25		7.53		
<i>Number of Species</i>					26					
<i>Number of Hybrids</i>					0					

River Code: <b>05-103</b>	Stream: <b>Beaver Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>3.80</b>	Location: St. Rt. 101	Date Range: 07/06/2009
Time Fished: 6226 sec	Drainage: 19.9 sq mi	Thru: 08/11/2009
Dist Fished: 0.40 km	Basin: Sandusky River	Sampler Type: D E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	156	117.00	10.09	6.02	43.80	51.45
Western Blacknose Dace	N	G	S	T	231	173.25	14.94	0.67	4.91	3.89
Creek Chub	N	G	N	T	684	513.00	44.24	5.47	39.77	10.65
Common Shiner	N	I	S		205	153.75	13.26	0.84	6.12	5.47
Bluntnose Minnow	N	O	C	T	11	8.25	0.71	0.02	0.15	2.53
Central Stoneroller	N	H	N		144	108.00	9.31	0.48	3.48	4.43
Largemouth Bass	F	C	C		1	0.75	0.06	0.01	0.04	7.00
Green Sunfish	S	I	C	T	6	4.50	0.39	0.11	0.78	23.83
Green Sf X Hybrid					1	0.75	0.06	0.00	0.02	4.00
Blackside Darter	D	I	S		25	18.75	1.62	0.06	0.44	3.24
Johnny Darter	D	I	C		82	61.50	5.30	0.07	0.49	1.10
<i>Mile Total</i>					1,546	1,159.50		13.74		
<i>Number of Species</i>					10					
<i>Number of Hybrids</i>					1					

River Code: <b>05-103</b>	Stream: <b>Beaver Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>3.50</b>	Location: St. Rt. 101	Date Range: 07/06/2009
Time Fished: 4764 sec	Drainage: 19.9 sq mi	Thru: 08/11/2009
Dist Fished: 0.40 km	Basin: Sandusky River	Sampler Type: D E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	149	111.75	9.03	2.77	24.41	24.82
Goldfish	G	O	M	T	1	0.75	0.06	0.00	0.02	3.00
Western Blacknose Dace	N	G	S	T	199	149.25	12.06	0.43	3.78	2.88
Creek Chub	N	G	N	T	589	441.75	35.70	5.52	48.61	12.50
Common Shiner	N	I	S		195	146.25	11.82	0.72	6.35	4.93
Fathead Minnow	N	O	C	T	6	4.50	0.36	0.01	0.10	2.50
Bluntnose Minnow	N	O	C	T	36	27.00	2.18	0.09	0.82	3.43
Central Stoneroller	N	H	N		264	198.00	16.00	1.19	10.44	5.99
Largemouth Bass	F	C	C		2	1.50	0.12	0.03	0.28	21.00
Green Sunfish	S	I	C	T	31	23.25	1.88	0.35	3.06	14.97
Bluegill Sunfish	S	I	C	P	1	0.75	0.06	0.02	0.21	32.00
Green Sf X Hybrid					2	1.50	0.12	0.01	0.08	6.00
Blackside Darter	D	I	S		32	24.00	1.94	0.07	0.59	2.82
Johnny Darter	D	I	C		143	107.25	8.67	0.14	1.25	1.32
<i>Mile Total</i>					1,650	1,237.50		11.36		
<i>Number of Species</i>					13					
<i>Number of Hybrids</i>					1					

River Code: <b>05-105</b>	Stream: <b>Westerhouse Ditch</b>	Sample Date: <b>2009</b>
River Mile: <b>3.30</b>	Location: Snavely Rd.	Date Range: 08/03/2009
Time Fished: 2907 sec	Drainage: 9.6 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	126	252.00	5.61	4.17	16.92	16.56
Western Blacknose Dace	N	G	S	T	329	658.00	14.66	1.96	7.93	2.97
Creek Chub	N	G	N	T	914	1,828.00	40.73	8.89	36.06	4.86
Common Shiner	N	I	S		254	508.00	11.32	2.72	11.03	5.35
Fathead Minnow	N	O	C	T	8	16.00	0.36	0.02	0.10	1.50
Bluntnose Minnow	N	O	C	T	163	326.00	7.26	1.00	4.04	3.06
Central Stoneroller	N	H	N		273	546.00	12.17	4.16	16.87	7.62
Common Sh X Creek Chub					1	2.00	0.04	0.01	0.03	4.00
Green Sunfish	S	I	C	T	50	100.00	2.23	1.31	5.29	13.06
Bluegill Sunfish	S	I	C	P	1	2.00	0.04	0.12	0.50	62.00
Johnny Darter	D	I	C		125	250.00	5.57	0.30	1.23	1.22
<i>Mile Total</i>					2,244	4,488.00		24.67		
<i>Number of Species</i>					10					
<i>Number of Hybrids</i>					1					

River Code: <b>05-105</b>	Stream: <b>Westerhouse Ditch</b>	Sample Date: <b>2009</b>
River Mile: <b>0.70</b>	Location: St. Rt. 19	Date Range: 08/03/2009
Time Fished: 1813 sec	Drainage: 16.2 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	122	244.00	9.17	11.44	48.64	46.89
Western Blacknose Dace	N	G	S	T	66	132.00	4.96	0.49	2.09	3.72
Creek Chub	N	G	N	T	465	930.00	34.94	5.58	23.71	6.00
Common Shiner	N	I	S		266	532.00	19.98	2.20	9.34	4.13
Fathead Minnow	N	O	C	T	23	46.00	1.73	0.12	0.51	2.61
Bluntnose Minnow	N	O	C	T	64	128.00	4.81	0.33	1.40	2.58
Central Stoneroller	N	H	N		267	534.00	20.06	2.98	12.69	5.59
Common Sh X Creek Chub					2	4.00	0.15	0.02	0.07	4.00
Green Sunfish	S	I	C	T	4	8.00	0.30	0.16	0.67	19.75
Bluegill Sunfish	S	I	C	P	1	2.00	0.08	0.05	0.23	27.00
Blackside Darter	D	I	S		6	12.00	0.45	0.03	0.13	2.50
Johnny Darter	D	I	C		45	90.00	3.38	0.12	0.53	1.38
<i>Mile Total</i>					1,331	2,662.00		23.52		
<i>Number of Species</i>					11					
<i>Number of Hybrids</i>					1					



River Code: <b>05-108</b>	Stream: <b>Emerson Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>1.80</b>	Location: Twp. Rd. 179	Date Range: 07/27/2009
Time Fished: 5625 sec	Drainage: 19.9 sq mi	Thru: 09/16/2009
Dist Fished: 0.32 km	Basin: Sandusky River	Sampler Type: E
	No of Passes: 2	

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	69	65.75	5.17	1.60	17.53	24.28
Common Carp	G	O	M	T	1	1.25	0.10	0.25	2.74	200.00
Western Blacknose Dace	N	G	S	T	193	167.75	13.19	0.59	6.44	3.50
Creek Chub	N	G	N	T	769	719.75	56.58	5.73	62.86	7.96
Common Shiner	N	I	S		68	53.50	4.21	0.26	2.80	4.76
Bluntnose Minnow	N	O	C	T	10	9.00	0.71	0.04	0.46	4.60
Central Stoneroller	N	H	N		191	158.25	12.44	0.44	4.86	2.80
Green Sunfish	S	I	C	T	7	6.75	0.53	0.10	1.14	15.43
Johnny Darter	D	I	C		110	87.50	6.88	0.10	1.09	1.14
Greenside Darter	D	I	S	M	2	2.50	0.20	0.01	0.08	3.00
<i>Mile Total</i>					1,420	1,272.00		9.11		
<i>Number of Species</i>					10					
<i>Number of Hybrids</i>					0					

River Code: <b>05-109</b>	Stream: <b>Royer Ditch</b>	Sample Date: <b>2009</b>
River Mile: <b>6.80</b>	Location: Twp. Rd. 80	Date Range: 06/25/2009
Time Fished: 1800 sec	Drainage: 15.2 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	S	T	13	26.00	14.61			
Common Carp	G	O	M	T	3	6.00	3.37			
Common Shiner	N	I	S		1	2.00	1.12			
Fathead Minnow	N	O	C	T	35	70.00	39.33			
Yellow Bullhead		I	C	T	8	16.00	8.99			
Green Sunfish	S	I	C	T	29	58.00	32.58			
<i>Mile Total</i>					89	178.00				
<i>Number of Species</i>					6					
<i>Number of Hybrids</i>					0					

River Code: <b>05-219</b>	Stream: <b>Muddy Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>0.90</b>	Location: at DeMarr Shooting Club	Date Range: 07/15/2009
Time Fished: 6068 sec	Drainage: 110.0 sq mi	Thru: 09/01/2009
Dist Fished: 1.00 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Longnose Gar		P	M		2	2.00	0.50	0.22	0.07	108.50
Gizzard Shad		O	M		117	117.00	28.96	0.64	0.22	5.50
Smallmouth Buffalo	C	I	M		15	15.00	3.71	11.59	3.91	772.33
Spotted Sucker	R	I	S		2	2.00	0.50	0.05	0.02	25.00
Common Carp	G	O	M	T	130	130.00	32.18	266.74	89.94	2,051.82
Goldfish	G	O	M	T	25	25.00	6.19	7.35	2.48	293.82
Golden Shiner	N	I	M	T	1	1.00	0.25	0.00	0.00	2.00
Fathead Minnow	N	O	C	T	1	1.00	0.25	0.01	0.00	6.00
Bluntnose Minnow	N	O	C	T	3	3.00	0.74	0.01	0.00	4.67
Channel Catfish	F		C		6	6.00	1.49	3.20	1.08	533.33
White Bass	F	P	M		8	8.00	1.98	0.02	0.01	2.88
White Perch	E		M		1	1.00	0.25	0.00	0.00	3.00
White Crappie	S	I	C		1	1.00	0.25	0.01	0.00	10.00
Largemouth Bass	F	C	C		3	3.00	0.74	1.05	0.35	350.00
Green Sunfish	S	I	C	T	3	3.00	0.74	0.04	0.01	12.67
Bluegill Sunfish	S	I	C	P	26	26.00	6.44	1.21	0.41	46.50
Orangespotted Sunfish	S	I	C		11	11.00	2.72	0.10	0.03	9.09
Pumpkinseed Sunfish	S	I	C	P	13	13.00	3.22	0.33	0.11	25.00
Green Sf X Bluegill Sf					2	2.00	0.50	0.05	0.02	25.00
Yellow Perch			M		7	7.00	1.73	0.17	0.06	24.29
Logperch	D	I	S	M	4	4.00	0.99	0.04	0.01	9.75
Freshwater Drum			M	P	23	23.00	5.69	3.75	1.27	163.22
<i>Mile Total</i>					404	404.00		296.57		
<i>Number of Species</i>					21					
<i>Number of Hybrids</i>					1					

River Code: <b>05-220</b>	Stream: <b>Little Muddy Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>1.70</b>	Location: dst. St. Rt. 528	Date Range: 07/20/2009
Time Fished: 5322 sec	Drainage: 25.0 sq mi	Thru: 08/26/2009
Dist Fished: 1.00 km	Basin: Sandusky River	No of Passes: 2
		Sampler Type: A

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Bowfin		P	C		1	1.00	0.11	1.65	4.58	1,650.00
Gizzard Shad		O	M		567	567.00	61.23	2.80	7.76	4.93
Bigmouth Buffalo	C	I	M		2	2.00	0.22	0.09	0.26	47.00
Smallmouth Buffalo	C	I	M		6	6.00	0.65	0.11	0.32	19.00
Shorthead Redhorse	R	I	S	M	1	1.00	0.11	0.09	0.25	90.00
White Sucker	W	O	S	T	3	3.00	0.32	0.07	0.19	23.33
Spotted Sucker	R	I	S		5	5.00	0.54	0.21	0.58	42.00
Common Carp	G	O	M	T	10	10.00	1.08	9.15	25.38	915.00
Goldfish	G	O	M	T	221	221.00	23.87	13.90	38.56	62.90
Emerald Shiner	N	I	M		1	1.00	0.11	0.01	0.01	5.00
Fathead Minnow	N	O	C	T	1	1.00	0.11	0.00	0.01	3.00
Bluntnose Minnow	N	O	C	T	2	2.00	0.22	0.01	0.02	3.00
Common Carp X Goldfish	G	O		T	1	1.00	0.11	0.15	0.40	145.00
Channel Catfish	F		C		4	4.00	0.43	2.30	6.38	575.00
Brown Bullhead		I	C	T	1	1.00	0.11	0.04	0.10	35.00
White Bass	F	P	M		5	5.00	0.54	0.05	0.12	9.00
White Perch	E		M		16	16.00	1.73	0.06	0.17	3.75
Green Sunfish	S	I	C	T	4	4.00	0.43	0.11	0.29	26.25
Bluegill Sunfish	S	I	C	P	11	11.00	1.19	0.29	0.80	26.36
Orangespotted Sunfish	S	I	C		21	21.00	2.27	0.12	0.34	5.81
Pumpkinseed Sunfish	S	I	C	P	6	6.00	0.65	0.14	0.39	23.33
Green Sf X Bluegill Sf					3	3.00	0.32	0.09	0.25	30.00
Yellow Perch			M		9	9.00	0.97	0.10	0.28	11.11
Freshwater Drum			M	P	25	25.00	2.70	4.53	12.57	181.20
<i>Mile Total</i>					926	926.00		36.05		
<i>Number of Species</i>					22					
<i>Number of Hybrids</i>					2					

River Code: <b>05-224</b>	Stream: <b>Fishing Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>0.20</b>	Location: upst. Weikert Rd.	Date Range: 07/28/2009
Time Fished: 1500 sec	Drainage: 7.0 sq mi	
Dist Fished: 0.15 km	Basin: Sandusky River	No of Passes: 1
		Sampler Type: D

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	M		82	164.00	48.81			
White Sucker	W	O	S	T	4	8.00	2.38			
Goldfish	G	O	M	T	21	42.00	12.50			
Creek Chub	N	G	N	T	3	6.00	1.79			
Fathead Minnow	N	O	C	T	11	22.00	6.55			
Bluntnose Minnow	N	O	C	T	1	2.00	0.60			
Brown Bullhead		I	C	T	1	2.00	0.60			
Tadpole Madtom		I	C		2	4.00	1.19			
Blackstripe Topminnow		I	M		13	26.00	7.74			
Green Sunfish	S	I	C	T	3	6.00	1.79			
Bluegill Sunfish	S	I	C	P	10	20.00	5.95			
Orangespotted Sunfish	S	I	C		4	8.00	2.38			
Pumpkinseed Sunfish	S	I	C	P	2	4.00	1.19			
Green Sf X Bluegill Sf					3	6.00	1.79			
Yellow Perch			M		8	16.00	4.76			
<i>Mile Total</i>					168	336.00				
<i>Number of Species</i>					14					
<i>Number of Hybrids</i>					1					

River Code: <b>12-004</b>	Stream: <b>Sawmill Creek</b>	Sample Date: <b>2009</b>
River Mile: <b>1.10</b>	Location: Boos Rd.	Date Range: 08/11/2009
Time Fished: 1800 sec	Drainage:	
Dist Fished: 0.15 km	Basin: Huron River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Rainbow Trout	E		N		1	2.00	0.15			
White Sucker	W	O	S	T	6	12.00	0.89			
Goldfish	G	O	M	T	1	2.00	0.15			
Creek Chub	N	G	N	T	112	224.00	16.67			
Striped Shiner	N	I	S		2	4.00	0.30			
Bluntnose Minnow	N	O	C	T	16	32.00	2.38			
Central Stoneroller	N	H	N		206	412.00	30.65			
Largemouth Bass	F	C	C		1	2.00	0.15			
Green Sunfish	S	I	C	T	21	42.00	3.13			
Logperch	D	I	S	M	5	10.00	0.74			
Johnny Darter	D	I	C		6	12.00	0.89			
Rainbow Darter	D	I	S	M	288	576.00	42.86			
Round Goby	E				7	14.00	1.04			
<i>Mile Total</i>					672	1,344.00				
<i>Number of Species</i>					13					
<i>Number of Hybrids</i>					0					

## **Appendix J – Fish IBI and Mlwb Results**

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI	
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni- vores	Pioneering fishes	Insect- ivores	DELT anomalies			
Bark Creek - (05-002)																	
Year: 2009																	
3.20	E	08/11/2009	10.0	9(3)	4(3)	0(1)	0(1)	1(1)	1(1)	91(1)	85(1)	84(1)	12(1)	0.0(5)	33(1)	20	
South Creek - (05-044)																	
Year: 2009																	
7.90	E	08/04/2009	7.1	6(1)	5(3)	1(1)	0(1)	0(1)	3(3)	90(1)	44(1)	59(1)	3(1)	0.0(5)	88(1)	20	
4.00	D	08/18/2009	18.1	16(3)	7(5)	0(1)	1(1)	1(1)	3(1)	65(1)	56(1)	51(3)	21(1)	0.0(5)	126(1)	24	
Raccoon Creek - (05-045)																	
Year: 2009																	
13.30	E	08/04/2009	9.9	11(3)	5(3)	1(1)	0(1)	1(1)	3(3)	69(1)	7(5)	60(1)	15(1)	0.0(5)	476(3)	28	
11.30	E	08/04/2009	12.7	11(3)	5(3)	1(1)	0(1)	1(1)	3(1)	41(3)	16(5)	36(3)	22(3)	0.0(5)	724(3)	32	
10.20	D	06/29/2009	13.8	12(3)	7(5)	1(1)	1(1)	2(1)	5(3)	40(3)	20(3)	35(3)	11(1)	0.0(5)	1125(5)	34	
Pickereel Creek - (05-046)																	
Year: 2009																	
6.30	E	08/05/2009	9.5	10(3)	6(3)	2(3)	0(1)	1(1)	3(3)	73(1)	12(5)	58(1)	22(3)	0.0(5)	320(3)	32	
3.30	E	07/08/2009	19.9	8(1)	5(3)	1(1)	0(1)	1(1)	3(1)	54(1)	24(3)	19(5)	11(1)	0.9(5)	80(1) *	24	
3.30	E	08/12/2009	19.9	12(3)	6(3)	2(3)	1(1)	2(1)	4(3)	75(1)	49(1)	19(5)	13(1)	1.5(5)	365(3)	30	
L. Pickereel Creek - (05-049)																	
Year: 2009																	
2.10	E	08/05/2009	5.3	5(1)	1(1)	1(1)	0(1)	1(1)	1(1)	50(3)	49(1)	1(5)	23(3)	0.0(5)	156(3)	26	
Cold Creek - (05-050)																	
Year: 2009																	
0.50	D	08/05/2009	2.9	3(1)	0(1)	1(1)	0(1)	1(1)	1(1)	4(5)	4(5)	0(5)	47(5)	0.0(5)	195(3)	34	
Pipe Creek - (05-052)																	
Year: 2009																	
8.20	E	08/06/2009	14.7	7(1)	4(3)	0(1)	1(1)	1(1)	2(1)	80(1)	48(1)	72(1)	1(1)	0.0(5)	326(3)	20	
6.70	E	08/11/2009	18.4	11(3)	6(3)	0(1)	2(1)	2(1)	4(3)	77(1)	69(1)	59(1)	7(1)	0.0(5)	288(3)	24	
Buck Creek - (05-054)																	

♦ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.



River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI	
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni- vores	Pioneering fishes	Insect- ivores	DELT anomalies			
Year: 2009																	
0.20	E	08/04/2009	4.5	7(3)	5(3)	1(1)	0(1)	1(1)	3(3)	64(1)	15(3)	52(3)	14(1)	0.0(5)	514(5)	30	
Caswell Ditch - (05-058)																	
Year: 2009																	
0.90	E	07/17/2009	3.9	7(3)	4(3)	0(1)	0(1)	1(1)	1(1)	65(1)	60(1)	56(1)	6(1)	0.0(5)	346(3)	22	
0.90	E	08/12/2009	3.9	7(3)	4(3)	0(1)	0(1)	1(1)	1(1)	87(1)	86(1)	82(1)	9(1)	0.0(5)	219(3)	22	
Green Creek - (05-100)																	
Year: 2009																	
18.90	D	08/04/2009	19.9	9(3)	4(3)	2(3)	1(1)	3(3)	4(3)	41(3)	12(5)	25(5)	60(5)	0.0(5)	236(3)	42	
18.80	D	07/01/2009	19.9	13(3)	5(3)	2(3)	3(1)	4(3)	6(3)	38(3)	3(5)	19(5)	57(5)	0.0(5)	212(3)	42	
11.10	D	08/05/2009	19.9	12(3)	2(1)	2(3)	3(1)	5(5)	6(3)	80(1)	21(3)	59(1)	20(1)	0.0(5)	24(1) *	28	
11.10	D	09/10/2009	19.9	10(3)	3(1)	2(3)	3(1)	3(3)	6(3)	84(1)	45(1)	40(3)	16(1)	0.0(5)	38(1)	26	
9.00	D	08/04/2009	19.9	14(3)	5(3)	2(3)	3(1)	4(3)	6(3)	48(3)	6(5)	37(3)	37(3)	0.0(5)	159(1)	36	
9.00	D	09/10/2009	19.9	16(3)	6(3)	2(3)	5(3)	5(5)	7(3)	64(1)	22(3)	45(3)	30(3)	0.0(5)	131(1)	36	
3.90	D	08/04/2009	19.9	13(3)	2(1)	1(1)	3(1)	3(3)	4(3)	31(3)	67(1)	7(5)	20(1)	0.0(5)	63(1) *	28	
3.90	D	09/10/2009	19.9	18(5)	6(3)	1(1)	4(3)	3(3)	5(3)	7(5)	75(1)	5(5)	16(1)	0.0(5)	383(3)	38	
Beaver Creek - (05-103)																	
Year: 2009																	
3.80	D	07/06/2009	19.9	9(3)	5(3)	1(1)	0(1)	2(1)	4(3)	67(1)	11(5)	46(3)	23(1)	0.0(5)	393(3)	30	
3.80	E	08/11/2009	19.9	10(3)	5(3)	1(1)	0(1)	2(1)	4(3)	74(1)	11(5)	56(1)	18(1)	0.0(5)	294(3)	28	
3.50	D	07/06/2009	19.9	10(3)	5(3)	1(1)	0(1)	2(1)	4(3)	67(1)	9(5)	54(3)	21(1)	0.0(5)	425(3)	30	
3.50	E	08/11/2009	19.9	11(3)	6(3)	1(1)	0(1)	2(1)	4(3)	56(1)	14(5)	44(3)	28(3)	0.0(5)	534(3)	32	
Westerhouse Ditch - (05-105)																	
Year: 2009																	
3.30	E	08/03/2009	9.6	10(3)	6(3)	1(1)	0(1)	1(1)	3(3)	71(1)	13(5)	56(1)	19(1)	0.0(5)	1308(5)	30	
0.70	E	08/03/2009	16.2	11(3)	6(3)	1(1)	0(1)	2(1)	4(3)	56(1)	16(5)	45(3)	24(3)	0.0(5)	1174(5)	34	
Emerson Cr (Royer D) - (05-108)																	

♦ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI	
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni- vores	Pioneering fishes	Insect- ivores	DELT anomalies			
Year: 2009																	
6.80	E	06/25/2009	15.2	5(1)	2(1)	0(1)	0(1)	0(1)	2(1)	99(1)	57(1)	72(1)	43(3)	0.0(5)	2(1) *	18	
Emerson Creek - (05-108)																	
Year: 2009																	
1.80	E	07/27/2009	19.9	8(1)	5(3)	1(1)	0(1)	1(1)	3(1)	68(1)	5(5)	59(1)	17(1)	0.0(5)	486(3)	24	
1.80	E	09/16/2009	19.9	9(3)	5(3)	1(1)	1(1)	2(1)	4(3)	89(1)	8(5)	73(1)	5(1)	0.0(5)	118(1)	26	
Fishing Creek - (05-224)																	
Year: 2009																	
0.20	D	07/28/2009	7.0	13(3)	3(3)	0(1)	0(1)	0(1)	1(1)	28(5)	72(1)	11(5)	20(3)	0.0(5)	248(3)	32	
Sawmill Creek - (12-004)																	
Year: 2009																	
1.10	E	08/11/2009	13.5	10(3)	4(3)	0(1)	2(1)	3(3)	4(3)	23(5)	3(5)	23(5)	48(5)	0.0(5)	1032(5)	44	

♦ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Mile	Type	Date	Drainage area (sq mi)	Number of					Percent of Individuals						Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
				Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Simple Lithophils	Tolerant fishes	Omni- vores	Top carnivores	Insect- ivores	DELT anomalies			
Muskellunge Creek - (05003)																	
Year: 2009																	
5.40	E	08/11/2009	37	13(3)	1(1)	1(1)	0(1)	5(5)	50(5)	19(5)	6(5)	0.8(1)	78(5)	0.0(5)	406(3)	40	6.9
5.40	E	09/08/2009	37	12(3)	1(1)	1(1)	0(1)	5(5)	34(3)	39(3)	17(5)	0.5(1)	53(3)	0.0(5)	488(3)	34	7.0
Raccoon Creek - (05045)																	
Year: 2009																	
5.40	D	08/05/2009	22	15(3)	2(3)	1(1)	0(1)	1(1)	28(3)	66(1)	12(5)	0.2(1)	14(1)	0.0(5)	348(3)	28	6.2
5.40	E	09/15/2009	22	11(3)	2(3)	1(1)	0(1)	2(3)	13(1)	40(3)	3(5)	0.0(1)	10(1)	0.0(5)	208(3)	30	4.8
Mills Creek - (05051)																	
Year: 2009																	
10.40	E	07/08/2009	21	6(1)	1(1)	1(1)	0(1)	0(1)	22(3)	42(3)	24(3)	0.0(1)	2(1)	0.0(5)	170(1)	22	5.1
10.40	E	08/12/2009	21	9(3)	2(3)	1(1)	0(1)	2(3)	28(3)	49(3)	31(3)	0.0(1)	1(1)	0.0(5)	272(3)	30	5.6
6.00	E	07/08/2009	29	5(1)	0(1)	1(1)	0(1)	1(1)	23(3)	68(1)	68(1)	0.0(1)	10(1)	0.0(5)	33(1) *	18	3.4
6.00	E	08/12/2009	29	6(1)	0(1)	1(1)	0(1)	1(1)	14(1)	31(3)	26(3)	0.0(1)	3(1)	0.0(5)	1152(5)	24	6.4
5.20	D	07/07/2009	29	10(3)	2(3)	2(3)	0(1)	1(1)	30(3)	48(3)	37(1)	0.0(1)	2(1)	0.6(3)	380(3)	26	6.1
5.20	D	08/17/2009	29	7(1)	1(1)	1(1)	0(1)	1(1)	26(3)	64(1)	40(1)	0.0(1)	10(1)	0.0(5)	231(3)	20	5.3
3.70	D	07/07/2009	35	12(3)	1(1)	1(1)	0(1)	2(1)	54(5)	63(1)	56(1)	0.0(1)	7(1)	0.0(5)	599(3)	24	6.4
3.70	D	08/17/2009	35	11(3)	2(3)	1(1)	0(1)	1(1)	27(3)	52(1)	45(1)	0.0(1)	14(1)	0.0(5)	833(5)	26	7.3
1.30	D	07/07/2009	41	8(1)	1(1)	1(1)	0(1)	1(1)	12(1)	53(1)	47(1)	0.0(1)	10(1)	1.2(5)	71(1) *	16	4.3
1.30	D	09/09/2009	41	11(3)	1(1)	2(3)	0(1)	1(1)	27(3)	77(1)	64(1)	0.3(1)	5(1)	0.0(5)	114(1)	22	5.4
Pipe Creek - (05052)																	
Year: 2009																	
2.30	E	07/07/2009	22	5(1)	0(1)	2(3)	0(1)	0(1)	13(1)	31(3)	24(3)	0.0(1)	1(1)	0.0(5)	98(1) *	22	3.7
2.30	E	08/11/2009	22	8(1)	0(1)	2(3)	0(1)	0(1)	9(1)	46(3)	40(1)	9.4(5)	1(1)	0.0(5)	138(1)	24	na

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

River Mile	Type	Date	Drainage area (sq mi)	Number of				Percent of Individuals							DELTA anomalies	Rel.No. minus tolerants /(1.0 km)	IBI	Modified lwb
				Total species	Sunfish species	Sucker species	Intolerant species	Rnd-bodied suckers	Simple Lithophils	Tolerant fishes	Omni- vores	Top carnivores	Insect- ivores					
Sandusky River - (05-001)																		
Year: 2009																		
18.30	A	07/14/2009	1255	13(3)	4(5)	4(3)	1(1)	31(3)	31(3)	17(3)	13(5)	3(1)	80(5)	0.0(5)	304(3)	40	8.0	
18.30	A	09/01/2009	1255	13(3)	4(5)	4(3)	0(1)	10(1)	10(1)	33(1)	25(3)	5(1)	63(5)	0.0(5)	116(1) *	30	6.6	
16.80	A	07/14/2009	1256	28(5)	4(5)	9(5)	3(3)	26(3)	27(3)	21(3)	28(3)	6(3)	51(3)	0.0(5)	706(5)	46	10.6	
16.80	A	08/31/2009	1256	21(5)	3(3)	6(5)	2(3)	20(3)	21(1)	32(1)	39(1)	9(3)	45(3)	0.0(5)	328(3)	36	9.1	
15.20	A	07/13/2009	1260	21(5)	3(3)	5(3)	1(1)	36(3)	36(3)	7(5)	28(1)	7(3)	56(5)	0.6(3)	574(5)	40	10.1	
15.20	A	08/31/2009	1260	19(3)	5(5)	5(3)	0(1)	18(1)	19(1)	6(5)	68(1)	4(1)	23(1)	0.0(5)	744(5)	32	8.7	
15.20	A	09/15/2009	1260	27(5)	5(5)	9(5)	2(3)	18(1)	18(1)	12(5)	56(1)	7(3)	30(3)	0.0(5)	706(5)	42	10.3	
Muskellunge Creek - (05-003)																		
Year: 2009																		
0.80	A	07/20/2009	46	20(3)	3(3)	7(5)	1(1)	13(1)	14(1)	6(5)	73(1)	2(1)	23(1)	0.0(5)	830(5)	32	9.1	
0.80	A	08/26/2009	46	26(5)	5(5)	9(5)	2(3)	26(3)	28(3)	24(3)	35(1)	8(3)	47(3)	0.0(5)	240(3)	42	9.3	

♦ - IBI is low end adjusted.

\* - < 200 Total individuals in sample

\*\* - < 50 Total individuals in sample

River Mile	Type	Date	Drainage area (sq mi)	Number of					Percent of Individuals						Rel.No. minus tolerants /(1.0 km)	Modified	
				Total species	Centrarch. species	Sensitive species	Benthic species	Cyprinid species	Exotics	Tolerant fishes	Omni- vores	Top carnivores	Phyto- phils	DELT anomalies		IBI	lwb
Sandusky River - (05-001)																	
Year: 2009																	
12.80	A	07/13/2009	1264	15(3)	5(3)	2(1)	5(3)	3(3)	12(3)	20(5)	28(1)	5(1)	0.3(1)	0.0(5)	260(1)	26	9.2
12.80	A	08/31/2009	1264	17(5)	4(3)	2(1)	8(5)	3(3)	17(3)	21(3)	20(1)	7(1)	2.7(1)	0.8(5)	246(1)	26	9.2
5.50	A	07/15/2009	1330	20(5)	7(5)	2(1)	5(3)	4(3)	14(3)	30(3)	29(1)	8(1)	5.0(1)	0.7(5)	386(1)	32	8.6
5.50	A	09/01/2009	1330	21(5)	7(5)	3(3)	6(3)	3(3)	13(3)	26(3)	23(1)	13(1)	7.6(1)	0.0(5)	176(1)	33	8.8
1.30	A	09/01/2009	1335	20(5)	5(3)	4(3)	6(3)	3(3)	25(1)	56(1)	53(0)	4(1)	3.8(1)	0.0(5)	154(1)	27	6.6
1.30	A	07/15/2009	1335	20(5)	6(3)	3(3)	7(5)	2(1)	7(5)	24(5)	21(1)	10(1)	7.4(1)	0.0(5)	210(1)	36	8.4
Muddy Creek - (05-219)																	
Year: 2009																	
0.90	A	07/15/2009	110	14(3)	5(3)	1(1)	3(1)	3(3)	34(1)	45(1)	44(1)	6(1)	5.4(1)	0.0(5)	312(1)	22	7.6
0.90	A	09/01/2009	110	12(3)	7(5)	1(1)	3(1)	1(1)	50(0)	71(0)	69(0)	3(1)	8.7(1)	0.0(5)	262(1)	19	5.9
Little Muddy Creek - (05-220)																	
Year: 2009																	
1.70	A	07/20/2009	25	13(3)	4(3)	1(1)	3(1)	1(1)	9(3)	44(5)	41(0)	5(1)	0.7(1)	0.0(5)	216(1)	20	7.7
1.70	A	08/26/2009	25	12(3)	5(3)	0(0)	4(3)	2(1)	67(0)	78(0)	77(0)	0(1)	5.4(1)	0.4(5)	502(3)	20	6.2

## **Appendix K – Permits for Trout Hatcheries**

**Division of Wildlife**  
Ohio Department of Natural Resources

## AQUACULTURE PERMIT APPLICATION AND PERMIT

PRINT OR TYPE

Full Name of Applicant <u>Danny J. Longmeyer</u>		Telephone (area code) <u>419-684-9656</u>		County <u>Sand</u>
Street Address <u>P.O. Box 367</u>		City <u>Castalia</u>	State <u>Oh</u>	Zip Code <u>44824</u>
Business Name <u>Little Pickerel Creek Farm</u>				
Culture Facility Address <u>1932 TR 306</u>		City <u>Vickery</u>	State <u>Oh</u>	Zip Code <u>43464</u>
Does Applicant Now Hold a Valid Ohio Lake Erie Commercial Fishing License? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Commercial License Number	Type of Commercial Fishing Gear Used	

☐ I DO ☒ I DO NOT want my name listed as a propagator of fish for stocking. Your name will not be included on the propagators list if the application is not received before March 1 and only Division of Wildlife recommended species for pond stocking are included on this list.

☒ **CLASS A AQUACULTURE PERMIT (\$50)**

Sub-Total 50<sup>00</sup>

Includes the following permits at no charge, please check the permits you need.

- ☒ Bait Dealer Permit (\$40 value, see Publication 330)
- ☒ Fish Transportation Permit (\$65 value, see Publication 2)

Class A Permit Applicants - it is unlawful for any person possessing a Class A aquaculture permit to possess, buy, and sell any aquatic species for the purpose of aquaculture, except for "Unrestricted Species" (see Publication 61 for Unrestricted Species list and permit conditions).

List common and scientific names of Class A species to be produced for sale:

<u>Brown Trout</u>	<u>Salmo trutta</u>
<u>Brook Trout</u>	<u>Salvelinus fontinalis</u>
<u>Rainbow Trout</u>	<u>Salmo gairdneri</u>
<u>Golden Shiner</u>	<u>Notemigonus crysoleucas</u>
<u>Gold Fish</u>	<u>Carassius auratus</u>

☐ **CLASS B AQUACULTURE PERMIT (\$100)**

Sub-Total \_\_\_\_\_

Includes the following permits at no charge, please check the permits you need.

- ☐ Facility Inspection (hatchery superintendent signature required)
- ☐ Class A Aquaculture Permit (\$50 value, list Class A species above)
- ☐ Bait Dealer Permit (\$40 value, see Publication 330)
- ☐ Fish Transportation Permit (\$65 value, see Publication 2)

Class B Permit Applicants - it is unlawful for any person to engage in the propagation, rearing, or sale of a "Restricted Species" for the purpose of aquaculture without first obtaining a Class B aquaculture permit (see Publication 61 for Restricted Species list and permit conditions). Contact your nearest fish hatchery for your required facility inspection.

List common and scientific names of Class B species to be produced for sale:

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State of Ohio Fish Hatchery Supervisor Signature

Date





**Division of Wildlife**  
Ohio Department of Natural Resources

# AQUACULTURE PERMIT APPLICATION AND PERMIT

PRINT OR TYPE

Full Name of Applicant <b>Rockwell Springs Trout Club</b>		Telephone (area code) <b>(419) 684-5339</b>		County <b>Sandusky</b>
Street Address <b>1581 County Road 310</b>		City <b>Clyde</b>	State <b>Ohio</b>	Zip Code <b>43410</b>
Business Name <b>Rockwell Springs Trout Club</b>				
Culture Facility Address <b>1936 Township Road 306</b>		City <b>Vickery</b>	State <b>Ohio</b>	Zip Code <b>43464</b>
Does Applicant Now Hold a Valid Ohio Lake Erie Commercial Fishing License? * <input type="checkbox"/> Yes <input type="checkbox"/> No		Commercial License Number		Type of Commercial Fishing Gear Used

☐ I DO ☒ I DO NOT want my name listed as a propagator of fish for stocking. Your name will not be included on the propagators list if the application is not received before March 1 and only Division of Wildlife recommended species for pond stocking are included on this list.

☒ **CLASS A AQUACULTURE PERMIT (\$50)**

**Sub-Total \$50.00**

**Includes the following permits at no charge, please check the permits you need.**

- ☐ Bait Dealer Permit (\$40 value, see Publication 330)
- ☐ Fish Transportation Permit (\$65 value, see Publication 2)

Class A Permit Applicants - it is unlawful for any person possessing a Class A aquaculture permit to possess, buy, and sell any aquatic species for the purpose of aquaculture, except for "Unrestricted Species" (see Publication 61 for Unrestricted Species list and permit conditions).

**List common and scientific names of Class A species to be produced for sale:**

We will not be producing fish for sale. All fish produced will be stocked in the Club's streams

Species to be produced: rainbow trout - oncorhynchus mykiss  
brown trout - salmo trutta  
brook trout - salvelinus fontinalis  
tiger trout - hybrid cross of salmo trutta X salvelinus fontinalis

☐ **CLASS B AQUACULTURE PERMIT (\$100)**

**Sub-Total** \_\_\_\_\_

**Includes the following permits at no charge, please check the permits you need.**

- ☐ Facility Inspection (hatchery superintendent signature required)
- ☐ Class A Aquaculture Permit (\$50 value, list Class A species above)
- ☐ Bait Dealer Permit (\$40 value, see Publication 330)
- ☐ Fish Transportation Permit (\$65 value, see Publication 2)

Class B Permit Applicants - it is unlawful for any person to engage in the propagation, rearing, or sale of a "Restricted Species" for the purpose of aquaculture without first obtaining a Class B aquaculture permit (see Publication 61 for Restricted Species list and permit conditions). Contact your nearest fish hatchery for your required facility inspection.

**List common and scientific names of Class B species to be produced for sale:**

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\_\_\_\_\_  
State of Ohio Fish Hatchery Supervisor Signature

\_\_\_\_\_  
Date

**Sub-Total** \_\_\_\_\_

I have holding or wintering ponds at the following locations:

1. \_\_\_\_\_

2. \_\_\_\_\_

**Send the completed form to one of the following locations:**

1500 Dublin Road  
Columbus, OH 43215  
(614) 644-3925

952 Lima Avenue  
Findlay, OH 45840  
(419) 424-5000

912 Portage Lakes Drive  
Akron, OH 44319  
(330) 644-2293

360 E. State Street  
Athens, OH 45701  
(740) 589-9930

1076 Old Springfield Pike  
Xenia, OH 45385  
(937) 372-9261

305 E. Shoreline Drive  
Sandusky, OH 44870  
(419) 625-8062

7018 Home Gardner Road  
Castalia, OH 44824  
Erie County  
(419) 684-7499

10517 Canal Road, SE  
Hebron, OH 43025  
Licking County  
(740) 928-8092

2470 Roberts Mill Road, SW  
London, OH 43140  
Madison County  
(740) 852-1412

57199 Seneca Dam Road  
Senecaville, OH 43780  
Guernsey County  
(740) 685-5541

7487 SR 124  
Latham, OH 45646  
Pike County  
(740) 493-2717

01735 Feeder Road  
St. Marys, OH 45885  
Auglaize County  
(419) 394-5170



Division of Wildlife  
Ohio Department of Natural Resources

**AQUACULTURE PERMIT APPLICATION AND PERMIT**

PRINT OR TYPE

Full Name of Applicant <b>CASTALIA TROUT CLUB</b>		Telephone (area code) <b>419-684-5303</b>		County <b>ERIE</b>	
Street Address <b>604 N. WASHINGTON ST.</b>		City <b>CASTALIA</b>	State <b>OH.</b>	Zip Code <b>44824</b>	
Business Name <b>CASTALIA TROUT CLUB</b>					
Culture Facility Address <b>604 N. WASHINGTON ST.</b>		City <b>CASTALIA</b>	State <b>OH.</b>	Zip Code <b>44824</b>	
Does Applicant Now Hold a Valid Ohio Lake Erie Commercial Fishing License? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Commercial License Number		Type of Commercial Fishing Gear Used	

☐ I DO ☒ I DO NOT want my name listed as a propagator of fish for stocking. Your name will not be included on the propagators list if the application is not received before March 1 and only Division of Wildlife recommended species for pond stocking are included on this list.

☒ **CLASS A AQUACULTURE PERMIT (\$50)**

Sub-Total **\$50.00**

Includes the following permits at no charge, please check the permits you need.

- ☐ Bait Dealer Permit (\$40 value, see Publication 330)  
☐ Fish Transportation Permit (\$65 value, see Publication 2)

Class A Permit Applicants - it is unlawful for any person possessing a Class A aquaculture permit to possess, buy, and sell any aquatic species for the purpose of aquaculture, except for "Unrestricted Species" (see Publication 61 for Unrestricted Species list and permit conditions).

List common and scientific names of Class A species to be produced for sale: **RAINBOW, BROOK, BROWN TROUT.**

COPY

☐ **CLASS B AQUACULTURE PERMIT (\$100)**

Sub-Total \_\_\_\_\_

Includes the following permits at no charge, please check the permits you need.

- ☐ Facility Inspection (hatchery superintendent signature required)  
☐ Class A Aquaculture Permit (\$50 value, list Class A species above)  
☐ Bait Dealer Permit (\$40 value, see Publication 330)  
☐ Fish Transportation Permit (\$65 value, see Publication 2)

Class B Permit Applicants - it is unlawful for any person to engage in the propagation, rearing, or sale of a "Restricted Species" for the purpose of aquaculture without first obtaining a Class B aquaculture permit (see Publication 61 for Restricted Species list and permit conditions). Contact your nearest fish hatchery for your required facility inspection.

List common and scientific names of Class B species to be produced for sale: \_\_\_\_\_

State of Ohio Fish Hatchery Supervisor Signature

Date

☐ **WHITE AMUR DEALER PERMIT (No Charge)**

Sub-Total \_\_\_\_\_

Any person wanting to import or sell triploid white amur in the state of Ohio must possess a valid White Amur Dealer Permit (see Publication 61 for permit conditions).

I have holding or wintering ponds at the following locations:

1. \_\_\_\_\_

2. \_\_\_\_\_

Total Cost \$50.00

Attached is Check # \_\_\_\_\_ payable to Ohio Division of Wildlife in the amount of \$ 50.00

Steve M. Lasker / MANAGER  
Applicant's Signature

12/3/07  
Date

Amy Haeffle  
District Fish Management Supervisor

12/12/2008  
Date

Paul K...in  
Law Enforcement Supervisor

12-12-08  
Date

Aquaculture Class A Permit No.	Aquaculture Class B Permit No.	Transportation Permit No.	Bait Dealer Permit No.	White Amur Permit No.	Date Issued	Issued By
<u>22201A</u>		<u>22201A</u>	<u>22201A</u>		<u>12/12/08</u>	<u>BM</u>

Expires December 31, 2009

Send the completed form to one of the following locations:

**Wildlife District One**

1500 Dublin Road  
Columbus, OH 43215  
(614) 644-3925

**Wildlife District Two**

952 Lima Avenue  
Findlay, OH 45840  
(419) 424-5000

**Wildlife District Three**

912 Portage Lakes Drive  
Akron, OH 44319  
(330) 644-2293

**Wildlife District Four**

360 E. State Street  
Athens, OH 45701  
(740) 589-9930

**Wildlife District Five**

1076 Old Springfield Pike  
Xenia, OH 45385  
(937) 372-9261

**Sandusky Fish. & Enforce. Units**

305 E. Shoreline Drive  
Sandusky, OH 44870  
(419) 625-8062

For a Class B aquatic permit inspection,  
contact the closest state fish hatchery (SFH):

**Castalia SFH**

7018 Home Gardner Road  
Castalia, OH 44824  
Erie County  
(419) 684-7499

**Hebron SFH**

10517 Canal Road, SE  
Hebron, OH 43025  
Licking County  
(740) 928-8092

**London SFH**

2470 Roberts Mill Road, SW  
London, OH 43140  
Madison County  
(740) 852-1412

**Senecaville SFH**

57199 Seneca Dam Road  
Senecaville, OH 43780  
Guernsey County  
(740) 685-5541

**Kincaid SFH**

7487 SR 124  
Latham, OH 45646  
Pike County  
(740) 493-2717

**St. Marys SFH**

01735 Feeder Road  
St. Marys, OH 45885  
Auglaize County  
(419) 394-5170



## **Appendix L – Macroinvertebrate Summary Report**

River Mile	All Taxa			Sen. Taxa			EPT Taxa		CW Taxa	Ql. Tot.	Ql. S	QCTV	ICI	Nar.	Drain	Comments
	Total	Qt.	Ql.	Total	Qt.	Ql.	Total	Ql.		Taxa	T					
Sandusky River (05-001)																
Year: 2009																
18.05	37	15	30	4	2	3	4	2	0	12	0.25	28.5	6		1255.0	X2,8
17.70	48	38	27	21	17	11	17	11	0	1	11.00	42.7	34		1255.0	
15.40	27		27	13		13		11	0	1	13.00	43.3		G	1260.0	X11
4.70	20	14	12	2	1	1	2	2	0	2	0.50	39.2	0		1330.0	X8,11
Year: 1988																
17.70	33	21	22	3	2	1	6	3	0	8	0.13	27.4	10		1254.0	
15.80 E	22	15	17	1	1	1	4	2	0	5	0.20	33.0	0		1257.0	X11,15
14.30 W	11	5	8	1	1	0	1	0	0	6	0.00	22.7	0		1263.0	X8,11
14.10 E	9	7	5	0	0	0	0	0	0	4	0.00	0.0	0		1263.0	X8,11
9.80 W	11	8	7	0	0	0	1	0	0	3	0.00	0.0	0		1266.0	X8,11
7.00 E	18	11	10	0	0	0	2	0	0	5	0.00	23.1	0		1314.0	X8,11
4.70 E	12	8	8	0	0	0	2	0	0	3	0.00	23.1	0		1330.0	X8,11
3.00 E	13	8	8	0	0	0	2	0	0	2	0.00	0.0	0		1332.0	X8,11
0.60 W	12	5	11	0	0	0	1	0	0	5	0.00	23.1	0		1339.0	X8,11
Bark Creek (05-002)																
Year: 2009																
3.20	33		33	3		3		6	0	10	0.30	34.8		F	10.0	
Muskellunge Creek (05-003)																
Year: 2009																
5.40	50	22	40	19	10	14	12	12	0	3	4.67	39.6	24	G	37.0	X8
1.23	35	23	20	8	4	6	5	2	0	3	2.00	37.6	10		44.0	X8,11
South Creek (05-044)																
Year: 2009																
7.92	28		28	3		3		2	0	8	0.38	35.6		LF	7.1	
4.00	26		26	1		1		4	0	10	0.10	33.7		LF	18.1	
Raccoon Creek (05-045)																
Year: 2009																
13.30	42		42	10		10		9	1	6	1.67	38.9		MG	9.9	
11.30	23		23	0		0		3	0	6	0.00	34.7		P	12.7	
10.18	30		30	0		0		4	0	7	0.00	33.7		P	13.8	
5.45	50	22	43	10	6	7	6	6	0	9	0.78	37.6	34		23.6	
Year: 1995																
13.00	57	38	43	11	9	7	8	6	2	10	0.70	32.6	32		8.1	X19
11.70	43	24	29	5	3	2	4	4	2	10	0.20	31.8	22		9.7	X19
11.30	39	23	27	0	0	0	4	3	1	13	0.00	27.1	12		10.1	
11.00	17	8	12	0	0	0	1	1	0	11	0.00	18.5	0		10.2	X21
10.98	23	17	10	1	1	0	1	0	0	8	0.00	14.7	10		10.2	
10.75	27	21	9	0	0	0	1	1	0	7	0.00	18.9	4		10.3	

River Mile	All Taxa			Sen. Taxa			EPT Taxa		CW Taxa	Ql.	Ql.	QCTV	ICI	Nar.	Drain	Comments
	Total	Qt.	Ql.	Total	Qt.	Ql.	Total	Ql.		Tol.	S					
Raccoon Creek (05-045)																
10.20	29	19	15	0	0	0	3	1	0	9	0.00	18.9	12		10.7	
8.70	43	23	30	0	0	0	4	4	0	13	0.00	31.7	12		15.8	
6.50	42	31	29	4	4	0	2	0	1	9	0.00	31.8	20		19.2	
3.60	35	28	12	4	4	0	1	1	0	3	0.00	32.6	22		22.2	
Year: 1986																
13.00	54	20	40	5	1	4	8	7	0	9	0.44	34.8	16		8.1	X8,9,19
11.70	57	33	37	7	5	4	9	8	1	9	0.44	32.8	22		9.7	X8,19
11.30	16	9	11	0	0	0	0	0	0	10	0.00	12.6	2		10.1	
10.20	26	15	18	0	0	0	1	1	0	14	0.00	15.9	4		10.7	
8.70	46	23	37	2	2	0	3	2	0	23	0.00	22.6	12		15.8	X15
6.50	33	22	20	4	4	0	3	1	0	11	0.00	27.1	20		19.2	
3.10	46	28	30	4	4	1	4	4	0	9	0.11	32.6	24		22.4	
Year: 1983																
15.10 A	12		12	2		2		4	0	2	1.00	35.2			6.4	
13.00 A	25		25	3		3		6	0	4	0.75	34.8		MG	8.1	
13.00 B	34	20	23	3	2	2	7	6	1	7	0.29	32.4	18		8.1	X8,9,19
11.70 A	18		18	1		1		6	0	4	0.25	36.0		MG	9.7	
11.70 B	40	28	21	2	2	0	8	5	0	6	0.00	31.8	24		9.7	X19
11.30 A	10		10	0		0		0	0	6	0.00	21.7			10.1	
11.30 B	15	4	12	0	0	0	0	0	0	7	0.00	22.6	0		10.1	
10.20 B	26	12	22	0	0	0	1	1	0	14	0.00	15.9	4		10.7	
8.70 B	16	10	13	0	0	0	0	0	0	10	0.00	21.9	0		15.8	
6.50 A	17		17	0		0		3	0	6	0.00	29.8		P	19.2	
6.50 B	31	21	17	0	0	0	0	0	0	10	0.00	21.7	8		19.2	
3.10 A	8		8	0		0		2	0	3	0.00	29.8		P	22.4	
3.10 B	25	18	13	0	0	0	1	0	0	6	0.00	22.7	8		22.4	
Pickerel Creek (05-046)																
Year: 2009																
6.26	53		53	11		11		8	1	8	1.38	37.3		MG	9.5	
3.30	38		38	3		3		3	0	8	0.38	36.0		LF	43.7	
Year: 1983																
3.30	40	22	23	3	2	1	4	2	0	6	0.17	33.3	14		22.0	X3
Little Pickerel Creek (05-049)																
Year: 2009																
2.00	25		25	3		3		2	3	3	1.00	38.9		LF	5.5	
Cold Creek (05-050)																
Year: 2009																
0.40	31		31	7		7		7	1	6	1.17	35.5		F	2.9	

River Mile	All Taxa			Sen. Taxa			EPT Taxa		CW Taxa	QI.	QI.	QCTV	ICI	Nar.	Drain	Comments
	Total	Qt.	QI.	Total	Qt.	QI.	Total	QI.		Tol.	S					
Mills Creek (05-051)																
Year: 2009																
10.40	25		25	1		1		3	0	13	0.08	28.1		LF	21.0	
6.03	59	36	50	9	6	7	6	6	2	13	0.54	36.7	28		29.0	
5.20	49	28	43	10	8	6	6	6	1	9	0.67	38.5	38		29.0	
3.70	55	28	43	12	10	6	6	6	0	12	0.50	35.9	30		35.0	X13,15
1.35	49	24	36	6	2	4	8	6	0	11	0.36	33.7	18		41.0	X13
Year: 1985																
5.20	41	23	29	7	3	5	6	6	1	8	0.63	38.7	12		25.0	
4.60	38	25	26	3	3	1	2	1	2	13	0.08	23.1	18		26.0	
3.70	44	29	35	5	4	3	6	6	0	11	0.27	32.8	20		29.0	
2.80	38	24	25	4	3	3	5	5	0	6	0.50	32.9	12		33.0	
1.70	33	24	14	3	3	0	3	2	1	5	0.00	28.3	10		35.0	
1.00	22	16	18	0	0	0	1	0	0	12	0.00	22.6	6		36.0	
0.70	23	16	16	0	0	0	0	0	0	13	0.00	16.9	4		36.0	X15
0.20	16	9	13	0	0	0	0	0	0	10	0.00	18.5	0		36.4	X11
Pipe Creek (05-052)																
Year: 2009																
10.81	27		27	3		3		8	0	8	0.38	34.7		F	9.4	X18
8.18	48		48	11		11		14	1	7	1.57	37.6		G	14.7	
6.60	32		32	5		5		9	0	6	0.83	35.5		F	18.4	
2.50	43	19	35	6	3	4	5	4	0	5	0.80	35.6	22		22.7	X15
Little Raccoon Creek (05-053)																
Year: 1995																
4.30	38	25	22	5	5	1	1	1	2	7	0.14	33.4	22		1.9	X19
Year: 1983																
4.30	17		17	0		0		1	0	2	0.00	34.8		F	1.9	
2.50	22		22	1		1		1	0	6	0.17	32.4		F	3.8	
Buck Run (05-054)																
Year: 2009																
0.20	30		30	7		7		2	1	5	1.40	35.6		LF	4.5	
Year: 1986																
0.20	23		23	0		0		3	0	10	0.00	31.7			3.3	
Year: 1983																
0.20	5		5	0		0		0	0	3	0.00	0.0		P	3.3	
Caswell Ditch (05-058)																
Year: 2009																
0.85	58	33	46	13	8	8	9	9	0	12	0.67	35.6	30		3.9	X15,19
Year: 1995																
0.50	54	38	30	13	10	5	8	6	2	9	0.56	35.2	48		5.0	X19



River Mile	All Taxa			Sen. Taxa			EPT Taxa		CW Taxa	QI.	QI.	QCTV	ICI	Nar.	Drain	Comments
	Total	Qt.	QI.	Total	Qt.	QI.	Total	QI.		Tol.	S					
Year: 1985																
0.80	30		30	4		4		6	0	7	0.57	35.2		MG	5.0	
Green Creek (05-100)																
Year: 2009																
18.80	59	31	46	20	14	14	10	8	4	7	2.00	39.6	36		53.0	
12.85	52	33	36	19	15	10	8	7	2	4	2.50	39.5	26		71.0	
9.08	49	31	37	15	13	9	10	10	2	6	1.50	38.9	36		74.0	
5.06	44	26	31	11	8	8	8	8	1	4	2.00	39.6	22		78.3	X15
Beaver Creek (05-103)																
Year: 2009																
4.00	45		45	19		19		14	1	2	9.50	41.0		G	20.9	
3.48	70	33	52	27	14	19	15	13	0	8	2.38	41.0	44		43.4	X15
Westerhouse Ditch (05-105)																
Year: 2009																
3.25	54		54	13		13		15	0	6	2.17	38.9		G	9.6	
0.63	48		48	18		18		18	1	1	18.00	42.7		VG	16.2	
Emerson Creek (05-108)																
Year: 2009																
1.83	27		27	3		3		5	0	6	0.50	33.7		F	22.0	
Royer Ditch (05-109)																
Year: 2009																
9.90	30		30	2		2		3	0	14	0.14	29.7		F	6.4	X9
5.80	23		23	0		0		2	0	12	0.00	28.0		P	16.2	
Muddy Creek (05-219)																
Year: 2009																
1.23	28	14	19	0	0	0	3	0	0	8	0.00	28.5	0		110.0	X8,11
Year: 1988																
1.70	12	5	10	0	0	0	1	0	0	4	0.00	21.2	0		81.0	X8,11
1.10	7	4	6	0	0	0	0	0	0	2	0.00	0.0	0		111.0	X8,11
Little Muddy Creek (05-220)																
Year: 2009																
2.50	36	22	22	2	1	1	6	3	0	8	0.13	28.5	0		25.0	X8,11
Year: 1988																
1.70	14	7	11	0	0	0	0	0	0	5	0.00	18.7	0		26.0	X8,11
0.50	9	7	3	0	0	0	0	0	0	1	0.00	0.0	0		28.0	X8,11
Fishing Creek (05-224)																
Year: 2009																
0.20	20		20	0		0		2	0	10	0.00	30.5		P	7.0	
Sawmill Creek (12-004)																
Year: 2009																
1.10	35		35	9		9		8	1	3	3.00	38.0		MG	13.5	

## **Appendix M – Macroinvertebrate Taxa**

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Sandusky River  
just upst. Ballville Dam

Collection Date: 08/24/2009 River Code: 05-001 RM: 18.05

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01200	<i>Cordylophora lacustris</i>	1			
01801	<i>Turbellaria</i>	57 +			
03360	<i>Plumatella sp</i>	1 +			
03600	<i>Oligochaeta</i>	1178 +			
06201	<i>Hyaella azteca</i>	+			
11200	<i>Callibaetis sp</i>	+			
13400	<i>Stenacron sp</i>	+			
17200	<i>Caenis sp</i>	1			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	91 +			
24107	<i>Nasiaeschna pentacantha</i>	+			
27400	<i>Neurocordulia sp</i>	+			
28955	<i>Plathemis lydia</i>	+			
42700	<i>Belostoma sp</i>	+			
43300	<i>Ranatra sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
45900	<i>Notonecta sp</i>	+			
51206	<i>Cyrnellus fraternus</i>	97			
60900	<i>Peltodytes sp</i>	+			
65501	<i>Hydrophilidae</i>	+			
65800	<i>Berosus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	2 +			
69400	<i>Stenelmis sp</i>	28 +			
78655	<i>Procladius (Holotanypus) sp</i>	+			
83000	<i>Dicrotendipes sp</i>	+			
83050	<i>Dicrotendipes lucifer</i>	96			
83051	<i>Dicrotendipes simpsoni</i>	96			
83158	<i>Endochironomus nigricans</i>	+			
83300	<i>Glyptotendipes (G.) sp</i>	11964 +			
83310	<i>Glyptotendipes (Heynotendipes) amplus</i>	+			
84000	<i>Parachironomus sp</i>	96			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84800	<i>Tribelos jucundum</i>	+			
92615	<i>Cipangopaludina japonica</i>	+			
93900	<i>Elimia sp</i>	1			
95100	<i>Physella sp</i>	1 +			

No. Quantitative Taxa: 15      Total Taxa: 37

No. Qualitative Taxa: 30      ICI: 6

Number of Organisms: 13710      Qual EPT: 2

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Sandusky River

Collection Date: 08/24/2009 River Code: 05-001 RM: 17.70

Tiffin Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	67	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
01801	<i>Turbellaria</i>	182 +	85625	<i>Rheotanytarsus sp</i>	1125 +
03360	<i>Plumatella sp</i>	1	96930	<i>Laevapex fuscus</i>	+
03451	<i>Urnatella gracilis</i>	64	98600	<i>Sphaerium sp</i>	+
03600	<i>Oligochaeta</i>	352			
05900	<i>Lirceus sp</i>	+	No. Quantitative Taxa: 38		Total Taxa: 48
11130	<i>Baetis intercalaris</i>	134 +	No. Qualitative Taxa: 27		ICI: 34
11650	<i>Procladius sp (w/ hindwing pads)</i>	+	Number of Organisms: 11758		Qual EPT: 11
12200	<i>Isonychia sp</i>	4			
13000	<i>Leucrocota sp</i>	19			
13400	<i>Stenacron sp</i>	29 +			
13561	<i>Maccaffertium pulchellum</i>	219 +			
13570	<i>Maccaffertium terminatum</i>	29			
16700	<i>Tricorythodes sp</i>	82 +			
21200	<i>Calopteryx sp</i>	2			
22300	<i>Argia sp</i>	1 +			
48410	<i>Corydalis cornutus</i>	1 +			
50315	<i>Chimarra obscura</i>	+			
51206	<i>Cyrnellus fraternus</i>	178 +			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	1709 +			
52430	<i>Ceratopsyche morosa group</i>	1322 +			
52510	<i>Hydropsyche aerata</i>	97			
52520	<i>Hydropsyche bidens</i>	32			
52540	<i>Hydropsyche dicantha</i>	32 +			
53800	<i>Hydroptila sp</i>	109			
59970	<i>Petrophila sp</i>	166 +			
69400	<i>Stenelmis sp</i>	26 +			
74100	<i>Simulium sp</i>	+			
78140	<i>Labrundinia pilosella</i>	87			
78450	<i>Nilotanytus fimbriatus</i>	87			
80410	<i>Cricotopus (C.) sp</i>	173			
81231	<i>Nanocladius (N.) crassicornus</i> or <i>N. (N.) "rectinervis"</i>	173			
81240	<i>Nanocladius (N.) distinctus</i>	87 +			
82101	<i>Thienemanniella taurocapita</i>	32			
82220	<i>Tvetenia discoloripes group</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	260 +			
83050	<i>Dicrotendipes lucifer</i>	173			
83300	<i>Glyptotendipes (G.) sp</i>	87			
83310	<i>Glyptotendipes (Heynotendipes) amplus</i>	87			
83840	<i>Microtendipes pedellus group</i>	87			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	4356 +			
84460	<i>Polypedilum (P.) fallax group</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	87			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Sandusky River  
 State St.

Collection Date: 09/01/2009 River Code: 05-001 RM: 15.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03121	<i>Paludicella articulata</i>	+			
03600	<i>Oligochaeta</i>	+			
11119	<i>Plauditus dubius</i> or <i>P. virilis</i>	+			
11120	<i>Baetis flavistriga</i>	+			
11130	<i>Baetis intercalaris</i>	+			
12200	<i>Isonychia sp</i>	+			
13000	<i>Leucrocuta sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13561	<i>Maccaffertium pulchellum</i>	+			
16700	<i>Tricorythodes sp</i>	+			
22300	<i>Argia sp</i>	+			
44501	<i>Corixidae</i>	+			
48410	<i>Corydalis cornutus</i>	+			
50315	<i>Chimarra obscura</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa</i> group	+			
59970	<i>Petrophila sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum</i> group	+			
85625	<i>Rheotanytarsus sp</i>	+			
85800	<i>Tanytarsus sp</i>	+			
93900	<i>Elimia sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 27
No. Qualitative Taxa: 27	ICI:
Number of Organisms: 0	Qual EPT: 11

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Sandusky River  
upst. Wightman's Grove

Collection Date: 08/25/2009 River Code: 05-001 RM: 4.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01200	<i>Cordylophora lacustris</i>	1			
01801	<i>Turbellaria</i>	139			
03360	<i>Plumatella sp</i>	+			
03600	<i>Oligochaeta</i>	121			
06201	<i>Hyaella azteca</i>	2			+
08601	<i>Hydrachnidia</i>	8			+
17200	<i>Caenis sp</i>	25			+
22300	<i>Argia sp</i>	2			
44501	<i>Corixidae</i>	+			
51206	<i>Cyrnellus fraternus</i>	316			+
60300	<i>Dineutus sp</i>	1			
77120	<i>Ablabesmyia mallochi</i>	77			+
78450	<i>Nilotanytus fimbriatus</i>	77			
82710	<i>Chironomus (C.) sp</i>	+			
83050	<i>Diclotendipes lucifer</i>	155			
83051	<i>Diclotendipes simpsoni</i>	1159			
83300	<i>Glyptotendipes (G.) sp</i>	4636			+
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84520	<i>Polypedilum (Tripodura) halterale group</i>	+			
85800	<i>Tanytarsus sp</i>	+			

No. Quantitative Taxa: 14      Total Taxa: 20

No. Qualitative Taxa: 12      ICI: **14**

Number of Organisms: 6719      Qual EPT: 2

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Bark Creek  
Kelley Rd.

Collection Date: 07/21/2009 River Code: 05-002 RM: 3.20

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03360	<i>Plumatella sp</i>	+			
04964	<i>Mooreobdella microstoma</i>	+			
08220	<i>Orconectes (Gremicambarus) immunis</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11120	<i>Baetis flavistriga</i>	+			
11130	<i>Baetis intercalaris</i>	+			
11200	<i>Callibaetis sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
63900	<i>Laccophilus sp</i>	+			
65800	<i>Berosus sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84315	<i>Phaenopsectra flavipes</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84960	<i>Pseudochironomus sp</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
85800	<i>Tanytarsus sp</i>	+			
95100	<i>Physella sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 33
No. Qualitative Taxa: 33	ICI:
Number of Organisms: 0	Qual EPT: 6

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Muskellunge Creek  
Spieldenner Rd.

Collection Date: 08/25/2009 River Code: 05-003 RM: 5.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00653	<i>Eunapius fragilis</i>	+	85625	<i>Rheotanytarsus sp</i>	3
01801	<i>Turbellaria</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	2
02600	<i>Nematomorpha</i>	+	87540	<i>Hemerodromia sp</i>	+
03600	<i>Oligochaeta</i>	3 +	93900	<i>Elimia sp</i>	40 +
05900	<i>Lirceus sp</i>	+	96900	<i>Ferrissia sp</i>	2
06700	<i>Crangonyx sp</i>	+	98600	<i>Sphaerium sp</i>	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
08601	<i>Hydrachnidia</i>	+	No. Quantitative Taxa: 22		Total Taxa: 50
11020	<i>Acerpenna pygmaea</i>	+	No. Qualitative Taxa: 40		ICI: 24
11130	<i>Baetis intercalaris</i>	+	Number of Organisms: 216		Qual EPT: 12
13000	<i>Leucrocota sp</i>	+			
13400	<i>Stenacron sp</i>	48 +			
13521	<i>Stenonema femoratum</i>	16 +			
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	3 +			
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
45300	<i>Sigara sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	1 +			
57400	<i>Neophylax sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
59970	<i>Petrophila sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
66500	<i>Enochrus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68708	<i>Dubiraphia vittata group</i>	1			
68901	<i>Macronychus glabratus</i>	1 +			
69400	<i>Stenelmis sp</i>	4 +			
71900	<i>Tipula sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	2 +			
78140	<i>Labrundinia pilosella</i>	1			
78450	<i>Nilotanytus fimbriatus</i>	1			
79100	<i>Thienemannimyia group</i>	2			
80370	<i>Corynoneura lobata</i>	39			
81060	<i>Lopescladius sp</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	1			
83840	<i>Microtendipes pedellus group</i>	8 +			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	1 +			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	1 +			
84460	<i>Polypedilum (P.) fallax group</i>	36			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			



Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Muskellunge Creek  
Fangboner Rd.

Collection Date: 08/25/2009 River Code: 05-003 RM: 1.23

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	23			
01801	<i>Turbellaria</i>	1			
03040	<i>Fredericella sp</i>	+			
03600	<i>Oligochaeta</i>	24			
05800	<i>Caecidotea sp</i>	16			
06201	<i>Hyalella azteca</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11651	<i>Proclotron sp (w/o hindwing pads)</i>	1			
13400	<i>Stenacron sp</i>	22			
13521	<i>Stenonema femoratum</i>	13			
17200	<i>Caenis sp</i>	1	+		
21200	<i>Calopteryx sp</i>		+		
22300	<i>Argia sp</i>	7	+		
43300	<i>Ranatra sp</i>		+		
59300	<i>Mystacides sp</i>		+		
60400	<i>Gyrinus sp</i>		+		
60900	<i>Peltodytes sp</i>		+		
68601	<i>Ancyronyx variegata</i>		+		
68901	<i>Macronychus glabratus</i>	1			
77800	<i>Helopelopia sp</i>		+		
78655	<i>Procladius (Holotanypus) sp</i>	21	+		
82730	<i>Chironomus (C.) decorus group</i>	106			
83040	<i>Dicrotendipes neomodestus</i>	255	+		
83050	<i>Dicrotendipes lucifer</i>	276			
83051	<i>Dicrotendipes simpsoni</i>	1276	+		
83300	<i>Glyptotendipes (G.) sp</i>	21			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	85	+		
84300	<i>Phaenopsectra obediens group</i>	21			
84460	<i>Polypedilum (P.) fallax group</i>	64			
84750	<i>Stictochironomus sp</i>		+		
84790	<i>Tribelos fuscicorne</i>	21			
85500	<i>Paratanytarsus sp</i>	128	+		
85800	<i>Tanytarsus sp</i>		+		
85821	<i>Tanytarsus glabrescens group sp 7</i>	21	+		
98001	<i>Sphaeriidae</i>	1			

No. Quantitative Taxa: 23      Total Taxa: 35

No. Qualitative Taxa: 20      ICI: **20**

Number of Organisms: 2405      Qual EPT: 2

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: South Creek  
 Co. Rd. 229

Collection Date: 07/28/2009 River Code: 05-044 RM: 7.92

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03600	<i>Oligochaeta</i>	+			
04664	<i>Helobdella stagnalis</i>	+			
04935	<i>Erpobdella punctata punctata</i>	+			
04964	<i>Mooreobdella microstoma</i>	+			
11130	<i>Baetis intercalaris</i>	+			
21200	<i>Calopteryx sp</i>	+			
22300	<i>Argia sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
65800	<i>Berosus sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67000	<i>Helophorus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71300	<i>Limonia sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
80440	<i>Cricotopus (C.) trifascia</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
85800	<i>Tanytarsus sp</i>	+			
95100	<i>Physella sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 28
No. Qualitative Taxa: 28	ICI:
Number of Organisms: 0	Qual EPT: 2

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: South Creek  
Whitmore Rd.

Collection Date: 07/27/2009 River Code: 05-044 RM: 4.00

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
05900	<i>Lirceus sp</i>	+			
06700	<i>Crangonyx sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
45300	<i>Sigara sp</i>	+			
45900	<i>Notonecta sp</i>	+			
48200	<i>Chauliodes sp</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
60400	<i>Gyrinus sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
65800	<i>Berosus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
72700	<i>Anopheles sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			

No. Quantitative Taxa: 0      Total Taxa: 26

No. Qualitative Taxa: 26      ICI:

Number of Organisms: 0      Qual EPT: 4

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Raccoon Creek

Collection Date: 07/08/2009 River Code: 05-045 RM: 13.30

Limerick Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03600	<i>Oligochaeta</i>	+			
04964	<i>Mooreobdella microstoma</i>	+			
05900	<i>Lirceus sp</i>	+			
06201	<i>Hyaella azteca</i>	+			
06700	<i>Crangonyx sp</i>	+			
07701	<i>Cambaridae</i>	+			
11120	<i>Baetis flavistriga</i>	+			
11130	<i>Baetis intercalaris</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
27500	<i>Somatochlora sp</i>	+			
45300	<i>Sigara sp</i>	+			
50804	<i>Lype diversa</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53501	<i>Hydroptilidae</i>	+			
68075	<i>Psephenus herricki</i>	+			
68130	<i>Helichus sp</i>	+			
68702	<i>Dubiraphia bivittata</i>	+			
68901	<i>Macronychus glabratus</i>	+			
69400	<i>Stenelmis sp</i>	+			
71900	<i>Tipula sp</i>	+			
72340	<i>Dixella sp</i>	+			
74100	<i>Simulium sp</i>	+			
78450	<i>Nilotanytus fimbriatus</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
84315	<i>Phaenopsectra flavipes</i>	+			
84700	<i>Stenochironomus sp</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85230	<i>Cladotanytarsus mancus group</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
85720	<i>Stempellinella fimbriata</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98200	<i>Pisidium sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Raccoon Creek  
U.S. Rt. 20

Collection Date: 07/08/2009 River Code: 05-045 RM: 11.30

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03600	<i>Oligochaeta</i>	+			
04935	<i>Erpobdella punctata punctata</i>	+			
04960	<i>Mooreobdella sp</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11120	<i>Baetis flavistriga</i>	+			
11130	<i>Baetis intercalaris</i>	+			
45300	<i>Sigara sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
66500	<i>Enochrus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
95100	<i>Physella sp</i>	+			
96120	<i>Menetus (Micromenetus) dilatatus</i>	+			
96900	<i>Ferrissia sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0 Total Taxa: 23

No. Qualitative Taxa: 23 ICI:

Number of Organisms: 0 Qual EPT: 3

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Raccoon Creek  
Twp. Rd. 223

Collection Date: 07/08/2009 River Code: 05-045 RM: 10.18

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00556	<i>Ephydatia fluviatilis</i>	+			
01801	<i>Turbellaria</i>	+			
03360	<i>Plumatella sp</i>	+			
03600	<i>Oligochaeta</i>	+			
04964	<i>Mooreobdella microstoma</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11130	<i>Baetis intercalaris</i>	+			
21300	<i>Hetaerina sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
23600	<i>Aeshna sp</i>	+			
49200	<i>Climacia sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
65800	<i>Berosus sp</i>	+			
67000	<i>Helophorus sp</i>	+			
71900	<i>Tipula sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 30
No. Qualitative Taxa: 30	ICI:
Number of Organisms: 0	Qual EPT: 4

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Raccoon Creek

Collection Date: 08/18/2009 River Code: 05-045 RM: 5.45

Twp. Rd. 244 (Karbler Rd.)

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00556	<i>Ephydatia fluviatilis</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	9 +
01801	<i>Turbellaria</i>	21 +	85840	<i>Tanytarsus sepp</i>	+
03360	<i>Plumatella sp</i>	+	87540	<i>Hemerodromia sp</i>	19 +
03600	<i>Oligochaeta</i>	+	95100	<i>Physella sp</i>	+
06700	<i>Crangonyx sp</i>	+	96900	<i>Ferrissia sp</i>	4 +
11130	<i>Baetis intercalaris</i>	34 +	98600	<i>Sphaerium sp</i>	4 +
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+	No. Quantitative Taxa: 22		Total Taxa: 50
22001	<i>Coenagrionidae</i>	+	No. Qualitative Taxa: 43		ICI: 34
22300	<i>Argia sp</i>	+	Number of Organisms: 1519		Qual EPT: 6
23909	<i>Boyeria vinosa</i>	+			
50804	<i>Lype diversa</i>	+			
52200	<i>Cheumatopsyche sp</i>	470 +			
52530	<i>Hydropsyche depravata group</i>	295 +			
53800	<i>Hydroptila sp</i>	17 +			
60900	<i>Peltodytes sp</i>	+			
65800	<i>Berosus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	26 +			
71900	<i>Tipula sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	246 +			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	9			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	+			
78450	<i>Nilotanypus fimbriatus</i>	4			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80370	<i>Corynoneura lobata</i>	8 +			
80430	<i>Cricotopus (C.) tremulus group</i>	22			
80740	<i>Eukiefferiella claripennis group</i>	4 +			
81632	<i>Parakiefferiella n.sp 2</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	206 +			
82121	<i>Thienemanniella lobapodema</i>	4			
82141	<i>Thienemanniella xena</i>	42			
83040	<i>Dicrotendipes neomodestus</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84302	<i>Phaenopsectra punctipes</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	4			
84470	<i>Polypedilum (P.) illinoense</i>	4 +			
84750	<i>Stictochironomus sp</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	67			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Pickerel Creek

Collection Date: 07/08/2009 River Code: 05-046 RM: 6.26

Twp. Rd. 233 (Reinicke Rd.)

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+
04935	<i>Erpobdella punctata punctata</i>	+	84601	<i>Saetheria species 1 (sensu Jackson, 1977)</i>	+
06700	<i>Crangonyx sp</i>	+	84750	<i>Stictochironomus sp</i>	+
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	85500	<i>Paratanytarsus sp</i>	+
08601	<i>Hydrachnidia</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	+
11120	<i>Baetis flavistriga</i>	+	94400	<i>Fossaria sp</i>	+
11121	<i>Pseudocloeon sp</i>	+	95100	<i>Physella sp</i>	+
13400	<i>Stenacron sp</i>	+	96900	<i>Ferrissia sp</i>	+
13521	<i>Stenonema femoratum</i>	+	98600	<i>Sphaerium sp</i>	+
18704	<i>Hexagenia atrocaudata</i>	+			
21200	<i>Calopteryx sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 53
22001	<i>Coenagrionidae</i>	+	No. Qualitative Taxa: 53		ICI:
22300	<i>Argia sp</i>	+	Number of Organisms: 0		Qual EPT: 8
23600	<i>Aeshna sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
45300	<i>Sigara sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
53800	<i>Hydroptila sp</i>	+			
59570	<i>Oecetis nocturna</i>	+			
63300	<i>Hydroporini</i>	+			
65800	<i>Berosus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
71900	<i>Tipula sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78500	<i>Paramerina fragilis</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
81270	<i>Nanocladius (N.) spiniplenus</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82141	<i>Thienemanniella xena</i>	+			
82200	<i>Tvetenia bavarica group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			



**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Pickerel Creek

Collection Date: 08/18/2009 River Code: 05-046 RM: 3.30

Twp. Rd. 247

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
05800	<i>Caecidotea sp</i>	+			
06700	<i>Crangonyx sp</i>	+			
06810	<i>Gammarus fasciatus</i>	+			
07860	<i>Cambarus (Puncticambarus) robustus</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
18708	<i>Hexagenia bilineata</i>	+			
21200	<i>Calopteryx sp</i>	+			
23600	<i>Aeshna sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
42700	<i>Belostoma sp</i>	+			
43300	<i>Ranatra sp</i>	+			
43570	<i>Neoplea sp</i>	+			
44300	<i>Pelocoris sp</i>	+			
45000	<i>Hesperocorixa sp</i>	+			
45100	<i>Palmacorixa sp</i>	+			
45300	<i>Sigara sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
45900	<i>Notonecta sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
60900	<i>Peltodytes sp</i>	+			
67000	<i>Helophorus sp</i>	+			
67300	<i>Hydrochus sp</i>	+			
68300	<i>Cyphon sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
81632	<i>Parakiefferiella n.sp 2</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
89704	<i>Limnophora aequifrons</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0      Total Taxa: 38

No. Qualitative Taxa: 38      ICI:

Number of Organisms: 0      Qual EPT: 3

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Little Pickerel Creek  
 Stocker Rd.

Collection Date: 07/08/2009 River Code: 05-049 RM: 2.00

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
21200	<i>Calopteryx sp</i>	+			
50804	<i>Lype diversa</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
65700	<i>Anacaena sp</i>	+			
66500	<i>Enochrus sp</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
69400	<i>Stenelmis sp</i>	+			
71700	<i>Pilaria sp</i>	+			
71900	<i>Tipula sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
79880	<i>Prodiamesa olivacea</i>	+			
80204	<i>Brillia flavifrons group</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
80440	<i>Cricotopus (C.) trifascia</i>	+			
80700	<i>Eukiefferiella sp</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
82200	<i>Tvetenia bavarica group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85400	<i>Micropsectra sp</i>	+			
87540	<i>Hemerodromia sp</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 25
No. Qualitative Taxa: 25	ICI:
Number of Organisms: 0	Qual EPT: 2

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Cold Creek  
near mouth

Collection Date: 07/29/2009 River Code: 05-050 RM: 0.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
04653	<i>Glossiphonia complanata</i>	+			
04664	<i>Helobdella stagnalis</i>	+			
04701	<i>Piscicolidae</i>	+			
05800	<i>Caecidotea sp</i>	+			
05900	<i>Lirceus sp</i>	+			
06810	<i>Gammarus fasciatus</i>	+			
07860	<i>Cambarus (Puncticambarus) robustus</i>	+			
11020	<i>Acerpenna pygmaea</i>	+			
11125	<i>Pseudocloeon frondale</i>	+			
22001	<i>Coenagrionidae</i>	+			
50804	<i>Lype diversa</i>	+			
54160	<i>Ochrotrichia sp</i>	+			
57900	<i>Pycnopsyche sp</i>	+			
59550	<i>Oecetis inconspicua complex sp A (sensu Floyd, 1995)</i>	+			
59728	<i>Triaenodes marginatus</i>	+			
61400	<i>Agabus sp</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
71700	<i>Pilaria sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
79880	<i>Prodiamesa olivacea</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84750	<i>Stictochironomus sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98200	<i>Pisidium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 31
No. Qualitative Taxa: 31	ICI:
Number of Organisms: 0	Qual EPT: 7

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Mills Creek  
 Portland Rd.

Collection Date: 08/18/2009 River Code: 05-051 RM: 10.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
04664	<i>Helobdella stagnalis</i>	+			
04666	<i>Helobdella triserialis</i>	+			
04964	<i>Mooreobdella microstoma</i>	+			
22001	<i>Coenagrionidae</i>	+			
23600	<i>Aeshna sp</i>	+			
45300	<i>Sigara sp</i>	+			
45900	<i>Notonecta sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
53501	<i>Hydroptilidae</i>	+			
59570	<i>Oecetis nocturna</i>	+			
60800	<i>Haliplus sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
63900	<i>Laccophilus sp</i>	+			
65800	<i>Berosus sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84315	<i>Phaenopsectra flavipes</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 25
No. Qualitative Taxa: 25	ICI:
Number of Organisms: 0	Qual EPT: 3

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Mills Creek

Collection Date: 08/19/2009 River Code: 05-051 RM: 6.03

St. Rt. 99

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00556	<i>Ephydatia fluviatilis</i>	+	84020	<i>Parachironomus carinatus</i>	+
01801	<i>Turbellaria</i>	64 +	84210	<i>Paratendipes albimanus</i> or <i>P. duplicatus</i>	746 +
03360	<i>Plumatella sp</i>	1	84315	<i>Phaenopsectra flavipes</i>	47
03600	<i>Oligochaeta</i>	112 +	84450	<i>Polypedilum (Uresipedilum) flavum</i>	233 +
04664	<i>Helobdella stagnalis</i>	+	84470	<i>Polypedilum (P.) illinoense</i>	93 +
04666	<i>Helobdella triserialis</i>	8 +	85230	<i>Cladotanytarsus mancus</i> group	+
04935	<i>Erpobdella punctata punctata</i>	34 +	85400	<i>Micropsectra sp</i>	47
05900	<i>Lirceus sp</i>	+	85500	<i>Paratanytarsus sp</i>	326 +
11120	<i>Baetis flavistriga</i>	+	85625	<i>Rheotanytarsus sp</i>	326 +
11130	<i>Baetis intercalaris</i>	+	85720	<i>Stempellinella fimbriata</i>	47
21001	<i>Calopterygidae</i>	1	85800	<i>Tanytarsus sp</i>	186
22001	<i>Coenagrionidae</i>	+	85821	<i>Tanytarsus glabrescens</i> group sp 7	559 +
22300	<i>Argia sp</i>	84 +	87400	<i>Stratiomys sp</i>	+
23600	<i>Aeshna sp</i>	1 +	95100	<i>Physella sp</i>	547 +
44501	<i>Corixidae</i>	+	96900	<i>Ferrissia sp</i>	75 +
52200	<i>Cheumatopsyche sp</i>	2 +			
52430	<i>Ceratopsyche morosa</i> group	+	No. Quantitative Taxa: 36		Total Taxa: 59
52530	<i>Hydropsyche depravata</i> group	1 +	No. Qualitative Taxa: 50		ICI: 28
53800	<i>Hydroptila sp</i>	2 +	Number of Organisms: 5311		Qual EPT: 6
60900	<i>Peltodytes sp</i>	+			
65800	<i>Berosus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68601	<i>Ancyronyx variegata</i>	1 +			
68708	<i>Dubiraphia vittata</i> group	1 +			
69400	<i>Stenelmis sp</i>	33 +			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
72900	<i>Culex sp</i>	+			
74100	<i>Simulium sp</i>	9 +			
77120	<i>Ablabesmyia mallochi</i>	47			
77500	<i>Conchapelopia sp</i>	140 +			
78140	<i>Labrundinia pilosella</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	47 +			
79400	<i>Zavreliomyia sp</i>	+			
80204	<i>Brillia flavifrons</i> group	47			
80410	<i>Cricotopus (C.) sp</i>	186			
80420	<i>Cricotopus (C.) bicinctus</i>	233 +			
80430	<i>Cricotopus (C.) tremulus</i> group	559 +			
81231	<i>Nanocladius (N.) crassicornus</i> or <i>N. (N.) "rectinervis"</i>	93 +			
82141	<i>Thienemanniella xena</i>	+			
82730	<i>Chironomus (C.) decorus</i> group	+			
82820	<i>Cryptochironomus sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	373 +			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Mills Creek

Collection Date: 08/19/2009 River Code: 05-051 RM: 5.20

Bogart Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	3 +	85800	<i>Tanytarsus sp</i>	48 +
03600	<i>Oligochaeta</i>	48 +	85821	<i>Tanytarsus glabrescens group sp 7</i>	239
04664	<i>Helobdella stagnalis</i>	2 +	87400	<i>Stratiomys sp</i>	+
04666	<i>Helobdella triserialis</i>	1 +	95100	<i>Physella sp</i>	154 +
04935	<i>Erpobdella punctata punctata</i>	6 +	96900	<i>Ferrissia sp</i>	25
05900	<i>Lirceus sp</i>	+			
11120	<i>Baetis flavistriga</i>	+	No. Quantitative Taxa: 28		Total Taxa: 49
11130	<i>Baetis intercalaris</i>	1 +	No. Qualitative Taxa: 43		ICI: 38
13400	<i>Stenacron sp</i>	3 +	Number of Organisms: 4642		Qual EPT: 6
21200	<i>Calopteryx sp</i>	+			
22300	<i>Argia sp</i>	+			
23600	<i>Aeshna sp</i>	+			
28500	<i>Libellula sp</i>	+			
44501	<i>Corixidae</i>	+			
52200	<i>Cheumatopsyche sp</i>	45 +			
52430	<i>Ceratopsyche morosa group</i>	2 +			
52530	<i>Hydropsyche depravata group</i>	4 +			
60900	<i>Peltodytes sp</i>	+			
63900	<i>Laccophilus sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	2 +			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	17 +			
77500	<i>Conchapelopia sp</i>	95 +			
80370	<i>Corynoneura lobata</i>	8			
80420	<i>Cricotopus (C.) bicinctus</i>	48 +			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
82141	<i>Thienemanniella xena</i>	120 +			
82820	<i>Cryptochironomus sp</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	239			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	48			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	143 +			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	191 +			
84750	<i>Stictochironomus sp</i>	+			
85264	<i>Cladotanytarsus vanderwulpi group Type 4</i>	48			
85400	<i>Micropsectra sp</i>	48 +			
85500	<i>Paratanytarsus sp</i>	334 +			
85625	<i>Rheotanytarsus sp</i>	2720 +			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Mills Creek

Collection Date: 08/19/2009 River Code: 05-051 RM: 3.70

Strub Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01418	<i>Craspedacusta sowerbyi</i>	8		<i>Bode, 1980)</i>	
01801	<i>Turbellaria</i>	4 +	84210	<i>Paratendipes albimanus</i> or <i>P. duplicatus</i>	240 +
03360	<i>Plumatella sp</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	240 +
03600	<i>Oligochaeta</i>	+	84460	<i>Polypedilum (P.) fallax</i> group	60
04664	<i>Helobdella stagnalis</i>	+	84750	<i>Stictochironomus sp</i>	+
04935	<i>Erpobdella punctata punctata</i>	1 +	85500	<i>Paratanytarsus sp</i>	240 +
05800	<i>Caecidotea sp</i>	+	85625	<i>Rheotanytarsus sp</i>	160 +
05900	<i>Lirceus sp</i>	3 +	85720	<i>Stempellinella fimbriata</i>	20
06700	<i>Crangonyx sp</i>	3 +	85800	<i>Tanytarsus sp</i>	20
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	85821	<i>Tanytarsus glabrescens</i> group sp 7	340
11130	<i>Baetis intercalaris</i>	+	87540	<i>Hemerodromia sp</i>	+
13400	<i>Stenacron sp</i>	12 +	95100	<i>Physella sp</i>	1 +
21200	<i>Calopteryx sp</i>	9 +			
22300	<i>Argia sp</i>	2 +	No. Quantitative Taxa: 28		Total Taxa: 55
45300	<i>Sigara sp</i>	+	No. Qualitative Taxa: 43		ICI: 30
45900	<i>Notonecta sp</i>	+	Number of Organisms: 1824		Qual EPT: 6
52200	<i>Cheumatopsyche sp</i>	2 +			
52430	<i>Ceratopsyche morosa</i> group	+			
52530	<i>Hydropsyche depravata</i> group	+			
59570	<i>Oecetis nocturna</i>	+			
60900	<i>Peltodytes sp</i>	+			
63900	<i>Laccophilus sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67000	<i>Helophorus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68601	<i>Ancyronyx variegata</i>	1			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata</i> group	+			
68901	<i>Macronychus glabratus</i>	5			
69400	<i>Stenelmis sp</i>	1 +			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
74650	<i>Atrichopogon sp</i>	35			
77120	<i>Ablabesmyia mallochi</i>	40			
77500	<i>Conchapelopia sp</i>	80			
77750	<i>Hayesomyia senata</i> or <i>Thienemannimyia norena</i>	120			
78140	<i>Labrundinia pilosella</i>	60 +			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80370	<i>Corynoneura lobata</i>	97 +			
80420	<i>Cricotopus (C.) bicinctus</i>	+			
80430	<i>Cricotopus (C.) tremulus</i> group	+			
81250	<i>Nanocladius (N.) minimus</i>	+			
83820	<i>Microtendipes "caelum"</i> (sensu Simpson &	20			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Mills Creek

Collection Date: 08/19/2009 River Code: 05-051 RM: 1.35

Perkins Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00556	<i>Ephydatia fluviatilis</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	88
01801	<i>Turbellaria</i>	+	95100	<i>Physella sp</i>	1 +
03600	<i>Oligochaeta</i>	24	96900	<i>Ferrissia sp</i>	37 +
04901	<i>Erpobdellidae</i>	+	97601	<i>Corbicula fluminea</i>	+
06700	<i>Crangonyx sp</i>	+	98600	<i>Sphaerium sp</i>	19 +
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11120	<i>Baetis flavistriga</i>	1	No. Quantitative Taxa: 24		Total Taxa: 49
11130	<i>Baetis intercalaris</i>	32 +	No. Qualitative Taxa: 36		ICI: 18
11200	<i>Callibaetis sp</i>	+	Number of Organisms: 2965		Qual EPT: 6
13400	<i>Stenacron sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
21300	<i>Hetaerina sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	2 +			
23600	<i>Aeshna sp</i>	+			
45900	<i>Notonecta sp</i>	+			
49200	<i>Climacia sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	17 +			
53800	<i>Hydroptila sp</i>	10			
60800	<i>Haliphus sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
67000	<i>Helophorus sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
69400	<i>Stenelmis sp</i>	+			
71300	<i>Limonia sp</i>	8			
72700	<i>Anopheles sp</i>	+			
74650	<i>Atrichopogon sp</i>	1			
77500	<i>Conchapelopia sp</i>	88			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	530 +			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80420	<i>Cricotopus (C.) bicinctus</i>	1259 +			
80430	<i>Cricotopus (C.) tremulus group</i>	66			
82141	<i>Thienemanniella xena</i>	32			
82820	<i>Cryptochironomus sp</i>	22 +			
84315	<i>Phaenopsectra flavipes</i>	44			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84460	<i>Polypedilum (P.) fallax group</i>	221			
84470	<i>Polypedilum (P.) illinoense</i>	88 +			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	88 +			
84888	<i>Xenochironomus xenolabis</i>	+			
85500	<i>Paratanytarsus sp</i>	199			
85800	<i>Tanytarsus sp</i>	88			



**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Pipe Creek  
Harris Rd.

Collection Date: 07/27/2009 River Code: 05-052 RM: 10.81

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
04935	<i>Erpobdella punctata punctata</i>	+			
05900	<i>Lirceus sp</i>	+			
06201	<i>Hyalella azteca</i>	+			
06700	<i>Crangonyx sp</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11125	<i>Pseudocloeon frondale</i>	+			
11200	<i>Callibaetis sp</i>	+			
13000	<i>Leucrocuta sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
45300	<i>Sigara sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
53800	<i>Hydroptila sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
65700	<i>Anacaena sp</i>	+			
69400	<i>Stenelmis sp</i>	+			
72700	<i>Anopheles sp</i>	+			
72900	<i>Culex sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0      Total Taxa: 27

No. Qualitative Taxa: 27      ICI:

Number of Organisms: 0      Qual EPT: 8

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Pipe Creek

Collection Date: 07/27/2009 River Code: 05-052 RM: 8.18

Patten Tract Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	87540	<i>Hemerodromia sp</i>	+
03600	<i>Oligochaeta</i>	+	95100	<i>Physella sp</i>	+
05900	<i>Lirceus sp</i>	+	98200	<i>Pisidium sp</i>	+
06700	<i>Crangonyx sp</i>	+	98600	<i>Sphaerium sp</i>	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
08601	<i>Hydrachnidia</i>	+	No. Quantitative Taxa: 0		Total Taxa: 48
11120	<i>Baetis flavistriga</i>	+	No. Qualitative Taxa: 48		ICI:
11130	<i>Baetis intercalaris</i>	+	Number of Organisms: 0		Qual EPT: 14
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+			
13000	<i>Leucrocuta sp</i>	+			
13400	<i>Stenacron sp</i>	+			
17200	<i>Caenis sp</i>	+			
18700	<i>Hexagenia sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
45300	<i>Sigara sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
59310	<i>Mystacides sepulchralis</i>	+			
59570	<i>Oecetis nocturna</i>	+			
59730	<i>Triaenodes melaca</i>	+			
60400	<i>Gyrinus sp</i>	+			
61100	<i>Acilius sp</i>	+			
68201	<i>Scirtidae</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
71910	<i>Tipula abdominalis</i>	+			
72700	<i>Anopheles sp</i>	+			
72900	<i>Culex sp</i>	+			
74100	<i>Simulium sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
77500	<i>Conchapelopia sp</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
84210	<i>Paratendipes albimanus</i> or <i>P. duplicatus</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85500	<i>Paratanytarsus sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Pipe Creek  
upst. Schenk Rd.

Collection Date: 07/27/2009 River Code: 05-052 RM: 6.60

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03600	<i>Oligochaeta</i>	+			
05900	<i>Lirceus sp</i>	+			
11120	<i>Baetis flavistriga</i>	+			
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
18708	<i>Hexagenia bilineata</i>	+			
22001	<i>Coenagrionidae</i>	+			
27500	<i>Somatochlora sp</i>	+			
45100	<i>Palmarcorixa sp</i>	+			
45300	<i>Sigara sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
53800	<i>Hydroptila sp</i>	+			
59310	<i>Mystacides sepulchralis</i>	+			
67800	<i>Tropisternus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68201	<i>Scirtidae</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
71700	<i>Pilaria sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85230	<i>Cladotanytarsus mancus group</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 32
No. Qualitative Taxa: 32	ICI:
Number of Organisms: 0	Qual EPT: 9

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Collection Date: 08/19/2009 River Code: 05-052 RM: 2.50

Site: Pipe Creek  
upst. Columbus Ave.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00401	<i>Spongillidae</i>	+			
01801	<i>Turbellaria</i>	6 +			
03600	<i>Oligochaeta</i>	2			
04685	<i>Placobdella ornata</i>	+			
05800	<i>Caecidotea sp</i>	1			
05900	<i>Lirceus sp</i>	2 +			
06810	<i>Gammarus fasciatus</i>	35 +			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
08601	<i>Hydrachnidia</i>	1			
13400	<i>Stenacron sp</i>	23 +			
13521	<i>Stenonema femoratum</i>	245 +			
13561	<i>Maccaffertium pulchellum</i>	1			
21200	<i>Calopteryx sp</i>	+			
22300	<i>Argia sp</i>	+			
23600	<i>Aeshna sp</i>	+			
43570	<i>Neoplea sp</i>	+			
45300	<i>Sigara sp</i>	+			
45900	<i>Notonecta sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
60900	<i>Peltodytes sp</i>	+			
67000	<i>Helophorus sp</i>	+			
67700	<i>Paracymus sp</i>	+			
67750	<i>Sperchopsis tessellatus</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	3 +			
72700	<i>Anopheles sp</i>	+			
72900	<i>Culex sp</i>	+			
77500	<i>Conchapelopia sp</i>	2 +			
80204	<i>Brillia flavifrons group</i>	2			
80370	<i>Corynoneura lobata</i>	6			
81240	<i>Nanocladius (N.) distinctus</i>	1			
82730	<i>Chironomus (C.) decorus group</i>	9 +			
82820	<i>Cryptochironomus sp</i>	+			
84210	<i>Paratendipes albimanus</i> or <i>P. duplicatus</i>	5 +			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	17 +			
84460	<i>Polypedilum (P.) fallax group</i>	21			
84750	<i>Stictochironomus sp</i>	+			
85800	<i>Tanytarsus sp</i>	+			
85821	<i>Tanytarsus glabrescens group sp 7</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	2 +			
98600	<i>Sphaerium sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Buck Run  
Twp. Rd. 233

Collection Date: 07/28/2009 River Code: 05-054 RM: 0.20

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
04901	<i>Erpobdellidae</i>	+			
06700	<i>Crangonyx sp</i>	+			
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+			
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
22300	<i>Argia sp</i>	+			
23600	<i>Aeshna sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
59570	<i>Oecetis nocturna</i>	+			
65800	<i>Berosus sp</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69225	<i>Optioservus fastiditus</i>	+			
69400	<i>Stenelmis sp</i>	+			
74100	<i>Simulium sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
81632	<i>Parakiefferiella n.sp 2</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 30
No. Qualitative Taxa: 30	ICI:
Number of Organisms: 0	Qual EPT: 2

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Caswell Ditch

Collection Date: 08/19/2009 River Code: 05-058 RM: 0.85

Bogart Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	1	83040	<i>Dicrotendipes neomodestus</i>	3
03600	<i>Oligochaeta</i>	33 +	83840	<i>Microtendipes pedellus group</i>	23
04664	<i>Helobdella stagnalis</i>	1 +	84210	<i>Paratendipes albimanus or P. duplicatus</i>	15 +
04666	<i>Helobdella triserialis</i>	3 +	84450	<i>Polypedilum (Uresipedilum) flavum</i>	15 +
04685	<i>Placobdella ornata</i>	+	84460	<i>Polypedilum (P.) fallax group</i>	10
04935	<i>Erpobdella punctata punctata</i>	11 +	85500	<i>Paratanytarsus sp</i>	28
04960	<i>Mooreobdella sp</i>	+	85625	<i>Rheotanytarsus sp</i>	101 +
05900	<i>Lirceus sp</i>	11 +	85800	<i>Tanytarsus sp</i>	+
06201	<i>Hyaella azteca</i>	62 +	85821	<i>Tanytarsus glabrescens group sp 7</i>	18
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	85840	<i>Tanytarsus sepp</i>	3
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	87540	<i>Hemerodromia sp</i>	1
08601	<i>Hydrachnidia</i>	16 +	94400	<i>Fossaria sp</i>	2
11125	<i>Pseudocloeon frondale</i>	+	95100	<i>Physella sp</i>	416 +
11150	<i>Pseudocloeon propinquum</i>	+	98600	<i>Sphaerium sp</i>	1 +
11200	<i>Callibaetis sp</i>	+			
13400	<i>Stenacron sp</i>	112 +	No. Quantitative Taxa: 33		Total Taxa: 58
13521	<i>Stenonema femoratum</i>	+	No. Qualitative Taxa: 46		ICI: 30
18750	<i>Hexagenia limbata</i>	+	Number of Organisms: 1044		Qual EPT: 9
21200	<i>Calopteryx sp</i>	+			
22001	<i>Coenagrionidae</i>	14 +			
22300	<i>Argia sp</i>	+			
23704	<i>Anax junius</i>	+			
42700	<i>Belostoma sp</i>	+			
45300	<i>Sigara sp</i>	+			
47600	<i>Sialis sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	19 +			
52530	<i>Hydropsyche depravata group</i>	1 +			
53800	<i>Hydroptila sp</i>	12 +			
60900	<i>Peltodytes sp</i>	2 +			
63300	<i>Hydroporini</i>	+			
67700	<i>Paracymus sp</i>	+			
67800	<i>Tropisternus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68708	<i>Dubiraphia vittata group</i>	43 +			
68901	<i>Macronychus glabratus</i>	32 +			
69400	<i>Stenelmis sp</i>	4 +			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	10			
79030	<i>Tanytus "punctipennis" (sensu Roback, 1977)</i>	+			
80370	<i>Corynoneura lobata</i>	18			
80440	<i>Cricotopus (C.) trifascia</i>	+			
81632	<i>Parakiefferiella n.sp 2</i>	3			
82820	<i>Cryptochironomus sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Green Creek

Collection Date: 08/17/2009 River Code: 05-100 RM: 18.80

Co. Rd. 34

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	26	84480	<i>Polypedilum (P.) laetum group</i>	+
03040	<i>Fredericella sp</i>	+	85400	<i>Micropsectra sp</i>	+
03600	<i>Oligochaeta</i>	42 +	85500	<i>Paratanytarsus sp</i>	23 +
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	85625	<i>Rheotanytarsus sp</i>	23 +
13400	<i>Stenacron sp</i>	44 +	85720	<i>Stempellinella fimbriata</i>	23
13521	<i>Stenonema femoratum</i>	9 +	85800	<i>Tanytarsus sp</i>	278 +
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	9 +	85802	<i>Tanytarsus curticornis</i>	162
17200	<i>Caenis sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	46
21200	<i>Calopteryx sp</i>	+	86100	<i>Chrysops sp</i>	+
45300	<i>Sigara sp</i>	+	86401	<i>Atherix lantha</i>	42 +
45400	<i>Trichocorixa sp</i>	+	87510	<i>Neoplasta sp</i>	49 +
47600	<i>Sialis sp</i>	+	87540	<i>Hemerodromia sp</i>	16
50804	<i>Lype diversa</i>	+	94400	<i>Fossaria sp</i>	1
51400	<i>Nyctiophylax sp</i>	1 +	95100	<i>Physella sp</i>	9 +
51600	<i>Polycentropus sp</i>	5 +	98200	<i>Pisidium sp</i>	+
52200	<i>Cheumatopsyche sp</i>	25			
52430	<i>Ceratopsyche morosa group</i>	1	No. Quantitative Taxa: 31		Total Taxa: 59
53800	<i>Hydroptila sp</i>	448 +	No. Qualitative Taxa: 46		ICI: 36
61400	<i>Agabus sp</i>	+	Number of Organisms: 2950		Qual EPT: 8
66500	<i>Enochrus sp</i>	+			
68130	<i>Helichus sp</i>	+			
68700	<i>Dubiraphia sp</i>	8			
69400	<i>Stenelmis sp</i>	+			
71900	<i>Tipula sp</i>	+			
72340	<i>Dixella sp</i>	+			
72900	<i>Culex sp</i>	+			
74100	<i>Simulium sp</i>	1 +			
74501	<i>Ceratopogonidae</i>	+			
77120	<i>Ablabesmyia mallochi</i>	23 +			
77500	<i>Conchapelopia sp</i>	857 +			
78655	<i>Procladius (Holotanypus) sp</i>	+			
79400	<i>Zavreliomyia sp</i>	+			
80370	<i>Corynoneura lobata</i>	16			
80420	<i>Cricotopus (C.) bicinctus</i>	23 +			
80430	<i>Cricotopus (C.) tremulus group</i>	+			
80740	<i>Eukiefferiella claripennis group</i>	+			
81650	<i>Parametriocnemus sp</i>	486 +			
81690	<i>Paratrichocladius sp</i>	69			
82200	<i>Tvetenia bavarica group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84300	<i>Phaenopsectra obediens group</i>	23			
84460	<i>Polypedilum (P.) fallax group</i>	162			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Green Creek

Collection Date: 08/18/2009 River Code: 05-100 RM: 12.85

Dewey Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01418	<i>Craspedacusta sowerbyi</i>	8	85711	<i>Stempellinella leptocelloides</i>	5
03600	<i>Oligochaeta</i>	72	85800	<i>Tanytarsus sp</i>	15
05800	<i>Caecidotea sp</i>	+	85802	<i>Tanytarsus curticornis</i>	163
06201	<i>Hyalella azteca</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	133
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	86401	<i>Atherix lantha</i>	27 +
08601	<i>Hydrachnidia</i>	28	87510	<i>Neoplasia sp</i>	8
13400	<i>Stenacron sp</i>	41 +	87540	<i>Hemerodromia sp</i>	28
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	24 +	98600	<i>Sphaerium sp</i>	+
17200	<i>Caenis sp</i>	53 +			
21200	<i>Calopteryx sp</i>	8 +	No. Quantitative Taxa: 33		Total Taxa: 52
22300	<i>Argia sp</i>	+	No. Qualitative Taxa: 36		ICI: 26
23909	<i>Boyeria vinosa</i>	+	Number of Organisms: 1948		Qual EPT: 7
45300	<i>Sigara sp</i>	+			
50804	<i>Lype diversa</i>	+			
51400	<i>Nyctiophylax sp</i>	5 +			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	49 +			
52430	<i>Ceratopsyche morosa group</i>	52			
60900	<i>Peltodytes sp</i>	+			
68130	<i>Helichus sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	4 +			
70600	<i>Antocha sp</i>	12			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74100	<i>Simulium sp</i>	1 +			
74501	<i>Ceratopogonidae</i>	12			
77500	<i>Conchapelopia sp</i>	15 +			
77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	15			
78140	<i>Labrundinia pilosella</i>	+			
78500	<i>Paramerina fragilis</i>	+			
80370	<i>Corynoneura lobata</i>	53			
80420	<i>Cricotopus (C.) bicinctus</i>	30 +			
81650	<i>Parametriocnemus sp</i>	59			
81690	<i>Paratrichocladius sp</i>	30 +			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	592 +			
82141	<i>Thienemanniella xena</i>	21 +			
82730	<i>Chironomus (C.) decorus group</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84460	<i>Polypedilum (P.) fallax group</i>	266 +			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	15			
84700	<i>Stenochironomus sp</i>	+			
85500	<i>Paratanytarsus sp</i>	15 +			
85625	<i>Rheotanytarsus sp</i>	89 +			



Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Green Creek

Collection Date: 08/18/2009 River Code: 05-100 RM: 9.08

Co. Rd. 229

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	59 +	86401	<i>Atherix lantha</i>	3 +
05900	<i>Lirceus sp</i>	+	87510	<i>Neoplasta sp</i>	1
06201	<i>Hyalella azteca</i>	+	87540	<i>Hemerodromia sp</i>	18
06700	<i>Crangonyx sp</i>	+	95100	<i>Physella sp</i>	+
07701	<i>Cambaridae</i>	4 +	98600	<i>Sphaerium sp</i>	1 +
13400	<i>Stenacron sp</i>	1 +			
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	1 +	No. Quantitative Taxa: 31		Total Taxa: 49
17200	<i>Caenis sp</i>	+	No. Qualitative Taxa: 37		ICI: 36
21200	<i>Calopteryx sp</i>	9 +	Number of Organisms: 2822		Qual EPT: 10
22300	<i>Argia sp</i>	+			
45300	<i>Sigara sp</i>	+			
47600	<i>Sialis sp</i>	+			
50804	<i>Lype diversa</i>	+			
51400	<i>Nyctiophylax sp</i>	5 +			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	59 +			
52430	<i>Ceratopsyche morosa group</i>	51 +			
52530	<i>Hydropsyche depravata group</i>	18 +			
53800	<i>Hydroptila sp</i>	122 +			
68708	<i>Dubiraphia vittata group</i>	1 +			
68901	<i>Macronychus glabratus</i>	19 +			
69400	<i>Stenelmis sp</i>	4 +			
72340	<i>Dixella sp</i>	+			
77800	<i>Helopelopia sp</i>	27 +			
79400	<i>Zavreliomyia sp</i>	+			
80204	<i>Brillia flavifrons group</i>	27			
80370	<i>Corynoneura lobata</i>	105			
80420	<i>Cricotopus (C.) bicinctus</i>	27 +			
80430	<i>Cricotopus (C.) tremulus group</i>	217			
81631	<i>Parakiefferiella n.sp 1</i>	54			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	734 +			
82141	<i>Thienemanniella xena</i>	33			
82730	<i>Chironomus (C.) decorus group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	27			
84460	<i>Polypedilum (P.) fallax group</i>	136			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	462			
85720	<i>Stempellinella fimbriata</i>	27			
85802	<i>Tanytarsus curticornis</i>	54 +			
85821	<i>Tanytarsus glabrescens group sp 7</i>	516			
86100	<i>Chrysops sp</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Green Creek

Collection Date: 08/18/2009 River Code: 05-100 RM: 5.06

Twp. Rd. 239

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01418	<i>Craspedacusta sowerbyi</i>	16			
03600	<i>Oligochaeta</i>	84 +	No. Quantitative Taxa: 26		Total Taxa: 44
05900	<i>Lirceus sp</i>	+	No. Qualitative Taxa: 31		ICI: 22
06700	<i>Crangonyx sp</i>	+	Number of Organisms: 2159		Qual EPT: 8
07701	<i>Cambaridae</i>	3			
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+			
13400	<i>Stenacron sp</i>	29 +			
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	4 +			
17200	<i>Caenis sp</i>	16 +			
21200	<i>Calopteryx sp</i>	6 +			
22300	<i>Argia sp</i>	27 +			
44501	<i>Corixidae</i>	+			
47600	<i>Sialis sp</i>	+			
50804	<i>Lype diversa</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	22 +			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
68601	<i>Ancyronyx variegata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
68901	<i>Macronychus glabratus</i>	2 +			
69400	<i>Stenelmis sp</i>	+			
74100	<i>Simulium sp</i>	+			
74501	<i>Ceratopogonidae</i>	16			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	22			
80204	<i>Brillia flavifrons group</i>	22			
80370	<i>Corynoneura lobata</i>	226			
80420	<i>Cricotopus (C.) bicinctus</i>	109 +			
80430	<i>Cricotopus (C.) tremulus group</i>	66 +			
80440	<i>Cricotopus (C.) trifascia</i>	+			
81631	<i>Parakiefferiella n.sp 1</i>	66			
81650	<i>Parametriocnemus sp</i>	22			
81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	350 +			
84155	<i>Paralauterborniella nigrohalteralis</i>	+			
84460	<i>Polypedilum (P.) fallax group</i>	526			
84470	<i>Polypedilum (P.) illinoense</i>	+			
85500	<i>Paratanytarsus sp</i>	22			
85625	<i>Rheotanytarsus sp</i>	66 +			
85821	<i>Tanytarsus glabrescens group sp 7</i>	416			
86401	<i>Atherix lantha</i>	2 +			
87540	<i>Hemerodromia sp</i>	18			
96900	<i>Ferrissia sp</i>	1			
98600	<i>Sphaerium sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Beaver Creek

Collection Date: 08/17/2009 River Code: 05-103 RM: 4.00

dst. Leafy Oaks WWTP

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	+	95100	<i>Physella sp</i>	+
06201	<i>Hyalella azteca</i>	+			
06700	<i>Crangonyx sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 45
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	No. Qualitative Taxa: 45		ICI:
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	Number of Organisms: 0		Qual EPT: 14
13000	<i>Leucrocuta sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+			
17200	<i>Caenis sp</i>	+			
18708	<i>Hexagenia bilineata</i>	+			
21200	<i>Calopteryx sp</i>	+			
22300	<i>Argia sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
50315	<i>Chimarra obscura</i>	+			
50906	<i>Psychomyia flavida</i>	+			
51400	<i>Nyctiophylax sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
59700	<i>Triaenodes sp</i>	+			
63300	<i>Hydroporini</i>	+			
66200	<i>Cymbiodyta sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68130	<i>Helichus sp</i>	+			
68201	<i>Scirtidae</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
70600	<i>Antocha sp</i>	+			
71300	<i>Limonia sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
81270	<i>Nanocladius (N.) spinipennis</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84440	<i>Polypedilum (Uresipedilum) aviceps</i>	+			
84480	<i>Polypedilum (P.) laetum group</i>	+			
84540	<i>Polypedilum (Tripodura) scalaenum group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85201	<i>Cladotanytarsus species group A</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Beaver Creek

Collection Date: 08/17/2009 River Code: 05-103 RM: 3.48

St. Rt. 101

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	77120	<i>Ablabesmyia mallochi</i>	13 +
03360	<i>Plumatella sp</i>	1	77500	<i>Conchapelopia sp</i>	18
03600	<i>Oligochaeta</i>	+	77800	<i>Helopelopia sp</i>	18
05800	<i>Caecidotea sp</i>	+	78140	<i>Labrundinia pilosella</i>	3 +
06201	<i>Hyaella azteca</i>	+	78450	<i>Nilotanypus fimbriatus</i>	3
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	78655	<i>Procladius (Holotanypus) sp</i>	+
08601	<i>Hydrachnidia</i>	1	80370	<i>Corynoneura lobata</i>	81
11020	<i>Acerpenna pygmaea</i>	18 +	81270	<i>Nanocladius (N.) spinipennis</i>	4
11120	<i>Baetis flavistriga</i>	8	83040	<i>Dicrotendipes neomodestus</i>	53
11130	<i>Baetis intercalaris</i>	10 +	83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+
11651	<i>Procladius sp (w/o hindwing pads)</i>	3 +	83840	<i>Microtendipes pedellus group</i>	31
13000	<i>Leucrocota sp</i>	17 +	84210	<i>Paratendipes albimanus or P. duplicatus</i>	4 +
13400	<i>Stenacron sp</i>	73 +	84450	<i>Polypedilum (Uresipedilum) flavum</i>	13
13521	<i>Stenonema femoratum</i>	52 +	84460	<i>Polypedilum (P.) fallax group</i>	22
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+	84480	<i>Polypedilum (P.) laetum group</i>	+
17200	<i>Caenis sp</i>	1	84750	<i>Stictochironomus sp</i>	+
21200	<i>Calopteryx sp</i>	1 +	85201	<i>Cladotanytarsus species group A</i>	+
22001	<i>Coenagrionidae</i>	+	85500	<i>Paratanytarsus sp</i>	9
22300	<i>Argia sp</i>	+	85625	<i>Rheotanytarsus sp</i>	22
23909	<i>Boyeria vinosa</i>	1 +	85800	<i>Tanytarsus sp</i>	58
27500	<i>Somatochlora sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	9
45100	<i>Palmaricoria sp</i>	+	85840	<i>Tanytarsus sepp</i>	31
45300	<i>Sigara sp</i>	+	86100	<i>Chrysops sp</i>	+
47600	<i>Sialis sp</i>	+	86401	<i>Atherix lantha</i>	1 +
50315	<i>Chimarra obscura</i>	+	95100	<i>Physella sp</i>	+
50906	<i>Psychomyia flavida</i>	+	96900	<i>Ferrissia sp</i>	10 +
51400	<i>Nyctiophylax sp</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	29 +	No. Quantitative Taxa: 33		Total Taxa: 70
59700	<i>Triaenodes sp</i>	+	No. Qualitative Taxa: 52		ICI: 44
60900	<i>Peltodytes sp</i>	+	Number of Organisms: 619		Qual EPT: 13
66500	<i>Enochrus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68201	<i>Scirtidae</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69250	<i>Optioservus ovalis</i>	+			
69400	<i>Stenelmis sp</i>	1 +			
70600	<i>Antocha sp</i>	+			
71100	<i>Hexatoma sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
72900	<i>Culex sp</i>	+			
73601	<i>Simuliidae</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Westerhouse Ditch  
Snively Rd.

Collection Date: 07/28/2009 River Code: 05-105 RM: 3.25

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+	84480	<i>Polypedilum (P.) laetum group</i>	+
03600	<i>Oligochaeta</i>	+	84750	<i>Stictochironomus sp</i>	+
06201	<i>Hyaella azteca</i>	+	85201	<i>Cladotanytarsus species group A</i>	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	85230	<i>Cladotanytarsus mancus group</i>	+
11120	<i>Baetis flavistriga</i>	+	85500	<i>Paratanytarsus sp</i>	+
11130	<i>Baetis intercalaris</i>	+	85625	<i>Rheotanytarsus sp</i>	+
11200	<i>Callibaetis sp</i>	+	86100	<i>Chrysops sp</i>	+
11430	<i>Dipheter hageni</i>	+	95100	<i>Physella sp</i>	+
13400	<i>Stenacron sp</i>	+	96900	<i>Ferrissia sp</i>	+
13521	<i>Stenonema femoratum</i>	+	98600	<i>Sphaerium sp</i>	+
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+			
17200	<i>Caenis sp</i>	+	No. Quantitative Taxa: 0		Total Taxa: 54
21200	<i>Calopteryx sp</i>	+	No. Qualitative Taxa: 54		ICI:
22001	<i>Coenagrionidae</i>	+	Number of Organisms: 0		Qual EPT: 15
22300	<i>Argia sp</i>	+			
23600	<i>Aeshna sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
44501	<i>Corixidae</i>	+			
47600	<i>Sialis sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
53800	<i>Hydroptila sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+			
59300	<i>Mystacides sp</i>	+			
59570	<i>Oecetis nocturna</i>	+			
59730	<i>Triaenodes melaca</i>	+			
67700	<i>Paracymus sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69225	<i>Optioservus fastiditus</i>	+			
69400	<i>Stenelmis sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
78140	<i>Labrundinia pilosella</i>	+			
78500	<i>Paramerina fragilis</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
83840	<i>Microtendipes pedellus group</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Westerhouse Ditch

Collection Date: 07/29/2009 River Code: 05-105 RM: 0.63

St. Rt. 19

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	+	84750	<i>Stictochironomus sp</i>	+
06201	<i>Hyalella azteca</i>	+	85625	<i>Rheotanytarsus sp</i>	+
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	86100	<i>Chrysops sp</i>	+
08250	<i>Orconectes (Procericambarus) rusticus</i>	+	96900	<i>Ferrissia sp</i>	+
08601	<i>Hydrachnidia</i>	+			
11020	<i>Acerpenna pygmaea</i>	+	No. Quantitative Taxa: 0		Total Taxa: 48
11120	<i>Baetis flavistriga</i>	+	No. Qualitative Taxa: 48		ICI:
11130	<i>Baetis intercalaris</i>	+	Number of Organisms: 0		Qual EPT: 18
11430	<i>Diphetor hageni</i>	+			
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+			
12200	<i>Isonychia sp</i>	+			
13000	<i>Leucrocuta sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
18700	<i>Hexagenia sp</i>	+			
22300	<i>Argia sp</i>	+			
45300	<i>Sigara sp</i>	+			
50315	<i>Chimarra obscura</i>	+			
50804	<i>Lype diversa</i>	+			
51600	<i>Polycentropus sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
59300	<i>Mystacides sp</i>	+			
59730	<i>Triaenodes melaca</i>	+			
68025	<i>Ectopria sp</i>	+			
68075	<i>Psephenus herricki</i>	+			
68300	<i>Cyphon sp</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69225	<i>Optioservus fastiditus</i>	+			
69400	<i>Stenelmis sp</i>	+			
72340	<i>Dixella sp</i>	+			
72700	<i>Anopheles sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	+			
77800	<i>Helopelopia sp</i>	+			
80204	<i>Brillia flavifrons group</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83820	<i>Microtendipes "caelum" (sensu Simpson &amp; Bode, 1980)</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84460	<i>Polypedilum (P.) fallax group</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
84480	<i>Polypedilum (P.) laetum group</i>	+			

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Emerson Creek

Collection Date: 07/28/2009 River Code: 05-108 RM: 1.83

Twp. Rd. 179

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
04935	<i>Erpobdella punctata punctata</i>	+			
05800	<i>Caecidotea sp</i>	+			
06201	<i>Hyalella azteca</i>	+			
06700	<i>Crangonyx sp</i>	+			
07701	<i>Cambaridae</i>	+			
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	+			
23600	<i>Aeshna sp</i>	+			
23909	<i>Boyeria vinosa</i>	+			
27500	<i>Somatochlora sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
68130	<i>Helichus sp</i>	+			
68201	<i>Scirtidae</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
72340	<i>Dixella sp</i>	+			
78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84460	<i>Polypedilum (P.) fallax group</i>	+			
84750	<i>Stictochironomus sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98200	<i>Pisidium sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0      Total Taxa: 27

No. Qualitative Taxa: 27      ICI:

Number of Organisms: 0      Qual EPT: 5

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Royer Ditch

Collection Date: 07/28/2009 River Code: 05-109 RM: 9.90

dst. Co. Rd. 46

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
03360	<i>Plumatella sp</i>	+			
03600	<i>Oligochaeta</i>	+			
04935	<i>Erpobdella punctata punctata</i>	+			
08601	<i>Hydrachnidia</i>	+			
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
27500	<i>Somatochlora sp</i>	+			
45300	<i>Sigara sp</i>	+			
45900	<i>Notonecta sp</i>	+			
60400	<i>Gyrinus sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
65800	<i>Berosus sp</i>	+			
66500	<i>Enochrus sp</i>	+			
67000	<i>Helophorus sp</i>	+			
67300	<i>Hydrochus sp</i>	+			
72600	<i>Aedes sp</i>	+			
72700	<i>Anopheles sp</i>	+			
72900	<i>Culex sp</i>	+			
74501	<i>Ceratopogonidae</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
83300	<i>Glyptotendipes (G.) sp</i>	+			
84470	<i>Polypedilum (P.) illinoense</i>	+			
85821	<i>Tanytarsus glabrescens group sp 7</i>	+			
94400	<i>Fossaria sp</i>	+			
95100	<i>Physella sp</i>	+			

No. Quantitative Taxa: 0      Total Taxa: 30

No. Qualitative Taxa: 30      ICI:

Number of Organisms: 0      Qual EPT: 3



**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Royer Ditch

Collection Date: 07/28/2009 River Code: 05-109 RM: 5.80

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	+			
03600	<i>Oligochaeta</i>	+			
04664	<i>Helobdella stagnalis</i>	+			
04935	<i>Erpobdella punctata punctata</i>	+			
05900	<i>Lirceus sp</i>	+			
06201	<i>Hyalella azteca</i>	+			
08220	<i>Orconectes (Gremicambarus) immunis</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
43205	<i>Nepa apiculata</i>	+			
45300	<i>Sigara sp</i>	+			
45900	<i>Notonecta sp</i>	+			
60900	<i>Peltodytes sp</i>	+			
63300	<i>Hydroporini</i>	+			
72900	<i>Culex sp</i>	+			
78500	<i>Paramerina fragilis</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
92613	<i>Cipangopaludina chinensis malleata</i>	+			
95100	<i>Physella sp</i>	+			
96264	<i>Planorbella (Pierosoma) pilsbryi</i>	+			
98100	<i>Musculium sp</i>	+			
98200	<i>Pisidium sp</i>	+			

No. Quantitative Taxa: 0      Total Taxa: 23

No. Qualitative Taxa: 23      ICI:

Number of Organisms: 0      Qual EPT: 2

Ohio EPA/DSW Ecological Assessment Section  
Macroinvertebrate Collection

Site: Muddy Creek  
east side of St. Rt. 53

Collection Date: 08/25/2009 River Code: 05-219 RM: 1.23

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01200	<i>Cordylophora lacustris</i>	5			
01320	<i>Hydra sp</i>	16			
01801	<i>Turbellaria</i>	2			
03360	<i>Plumatella sp</i>	1 +			
03600	<i>Oligochaeta</i>	3051 +			
04935	<i>Erpobdella punctata punctata</i>	+			
04964	<i>Mooreobdella microstoma</i>	+			
06810	<i>Gammarus fasciatus</i>	39 +			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
08451	<i>Palaemonetes kadiakensis</i>	+			
08601	<i>Hydrachnidia</i>	1			
17200	<i>Caenis sp</i>	3			
22001	<i>Coenagrionidae</i>	1 +			
45300	<i>Sigara sp</i>	+			
45400	<i>Trichocorixa sp</i>	+			
51206	<i>Cyrnellus fraternus</i>	46			
59520	<i>Oecetis cinerascens</i>	1			
60300	<i>Dineutus sp</i>	1			
60900	<i>Peltodytes sp</i>	+			
79040	<i>Tanytus stellatus</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83051	<i>Dicrotendipes simpsoni</i>	1029			
83158	<i>Endochironomus nigricans</i>	+			
83300	<i>Glyptotendipes (G.) sp</i>	9579 +			
84520	<i>Polypedilum (Tripodura) halterale group</i>	+			
94603	<i>Pseudosuccinea columella</i>	+			
95100	<i>Physella sp</i>	+			
96264	<i>Planorbella (Pierosoma) pilsbryi</i>	+			

No. Quantitative Taxa: 14      Total Taxa: 28

No. Qualitative Taxa: 19      ICI: 12

Number of Organisms: 13775      Qual EPT: 0

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Little Muddy Creek  
Kline Rd.

Collection Date: 08/25/2009 River Code: 05-220 RM: 2.50

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01200	<i>Cordylophora lacustris</i>	1			
01801	<i>Turbellaria</i>	271			
03600	<i>Oligochaeta</i>	1257			+
04601	<i>Glossiphoniidae</i>	1			
08250	<i>Orconectes (Procericambarus) rusticus</i>				+
08451	<i>Palaemonetes kadiakensis</i>				+
11200	<i>Callibaetis sp</i>				+
13521	<i>Stenonema femoratum</i>	1			
17200	<i>Caenis sp</i>	17			+
18750	<i>Hexagenia limbata</i>				+
22001	<i>Coenagrionidae</i>				+
22300	<i>Argia sp</i>	16			
45100	<i>Palmarcorixa sp</i>				+
45400	<i>Trichocorixa sp</i>				+
47600	<i>Sialis sp</i>	2			
51206	<i>Cyrnellus fraternus</i>	95			
52001	<i>Hydropsychidae</i>	8			
60300	<i>Dineutus sp</i>	13			
60900	<i>Peltodytes sp</i>				+
68708	<i>Dubiraphia vittata group</i>	9			
72420	<i>Chaoborus sp</i>				+
74501	<i>Ceratopogonidae</i>	8			
77355	<i>Clinotanypus pinguis</i>				+
79040	<i>Tanypus stellatus</i>				+
82800	<i>Cladopelma sp</i>				+
82820	<i>Cryptochironomus sp</i>				+
83051	<i>Dicrotendipes simpsoni</i>	596			
83111	<i>Einfeldia nr. natchitocheae</i>	28			+
83158	<i>Endochironomus nigricans</i>	85			+
83300	<i>Glyptotendipes (G.) sp</i>	1505			+
83320	<i>Glyptotendipes (Caulochironomus) sp</i>				+
84520	<i>Polypedilum (Tripodura) halterale group</i>	57			+
85500	<i>Paratanytarsus sp</i>	28			
85625	<i>Rheotanytarsus sp</i>	28			
95100	<i>Physella sp</i>	3			+
98001	<i>Sphaeriidae</i>	1			+

No. Quantitative Taxa: 22      Total Taxa: 36

No. Qualitative Taxa: 22      ICI: **20**

Number of Organisms: 4030      Qual EPT: 3

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Collection Date: 07/21/2009 River Code: 05-224 RM: 0.20

Site: Fishing Creek  
upst. Weikert Rd.

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03600	<i>Oligochaeta</i>	+			
06700	<i>Crangonyx sp</i>	+			
08220	<i>Orconectes (Gremicambarus) immunis</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11200	<i>Callibaetis sp</i>	+			
17200	<i>Caenis sp</i>	+			
22001	<i>Coenagrionidae</i>	+			
45400	<i>Trichocorixa sp</i>	+			
72340	<i>Dixella sp</i>	+			
77130	<i>Ablabesmyia rhamphe group</i>	+			
78655	<i>Procladius (Holotanypus) sp</i>	+			
80510	<i>Cricotopus (Isocladius) sylvestris group</i>	+			
82730	<i>Chironomus (C.) decorus group</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
83002	<i>Dicrotendipes modestus</i>	+			
83040	<i>Dicrotendipes neomodestus</i>	+			
83158	<i>Endochironomus nigricans</i>	+			
85500	<i>Paratanytarsus sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			

No. Quantitative Taxa: 0	Total Taxa: 20
No. Qualitative Taxa: 20	ICI:
Number of Organisms: 0	Qual EPT: 2

**Ohio EPA/DSW Ecological Assessment Section**  
**Macroinvertebrate Collection**

Site: Sawmill Creek  
Boos Rd.

Collection Date: 07/07/2009 River Code: 12-004 RM: 1.10

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	+			
06700	<i>Crangonyx sp</i>	+			
08250	<i>Orconectes (Procericambarus) rusticus</i>	+			
11120	<i>Baetis flavistriga</i>	+			
13000	<i>Leucrocuta sp</i>	+			
13400	<i>Stenacron sp</i>	+			
13521	<i>Stenonema femoratum</i>	+			
17200	<i>Caenis sp</i>	+			
21200	<i>Calopteryx sp</i>	+			
22300	<i>Argia sp</i>	+			
27500	<i>Somatochlora sp</i>	+			
52200	<i>Cheumatopsyche sp</i>	+			
52430	<i>Ceratopsyche morosa group</i>	+			
52530	<i>Hydropsyche depravata group</i>	+			
63300	<i>Hydroporini</i>	+			
68707	<i>Dubiraphia quadrinotata</i>	+			
68708	<i>Dubiraphia vittata group</i>	+			
69400	<i>Stenelmis sp</i>	+			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	+			
78450	<i>Nilotanyus fimbriatus</i>	+			
80410	<i>Cricotopus (C.) sp</i>	+			
81650	<i>Parametriocnemus sp</i>	+			
82820	<i>Cryptochironomus sp</i>	+			
84210	<i>Paratendipes albimanus or P. duplicatus</i>	+			
84300	<i>Phaenopsectra obediens group</i>	+			
84450	<i>Polypedilum (Uresipedilum) flavum</i>	+			
84750	<i>Stictochironomus sp</i>	+			
85625	<i>Rheotanytarsus sp</i>	+			
85800	<i>Tanytarsus sp</i>	+			
85821	<i>Tanytarsus glabrescens group sp 7</i>	+			
93900	<i>Elimia sp</i>	+			
95100	<i>Physella sp</i>	+			
96900	<i>Ferrissia sp</i>	+			
98600	<i>Sphaerium sp</i>	+			

No. Quantitative Taxa: 0      Total Taxa: 35

No. Qualitative Taxa: 35      ICI:

Number of Organisms: 0      Qual EPT: 8

**Appendix N – 2008 Water Chemistry Results for Public Drinking Water  
Assessment**

## Appendix N. Surface water results for pesticides and nutrient samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2008 - 2009.

HUC	0410001101-03		
Location	Snyders Ditch near Reservoirs at RR	Snyders Ditch near Reservoirs at RR	Snyders Ditch near Reservoirs at RR
River Mile	RM 2.32	RM 2.32	RM 2.32
STORET ID	U05K13	U05K13	U05K13
Date Sampled	5/22/08	6/12/08	5/18/09
Pesticides & other organic compounds (ug/l)			
Acetochlor	<0.22	2.33	<0.22
Alachlor	<0.22	<0.22	<0.22
Atrazine	<0.22	<0.22	<0.22
Benzo[a]pyrene	<0.54	<0.55	<0.54
bis(2-Ethylhexyl)adipate	<0.54	<0.55	<0.54
bis(2-Ethylhexyl)phthalate	1.07 B	3.02 B	0.88 B
Butachlor	<0.22	<0.22	<0.22
Metolachlor	<0.22	<0.22	<0.22
Metribuzin	<0.22	<0.22	<0.22
Pentachlorophenol	<5.4	<5.49	<5.38
Propachlor	<0.22	<0.22	<0.22
Simazine	<0.22	<0.22	0.26
Glyphosate	<5.0	<5.0	NS
Nutrients (mg/L)			
Nitrate-Nitrite	2.80	6.11	6.84
Ammonia	<0.050	NS	NS

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

NS – Not sampled.

## Appendix N. Surface water results for pesticides and nutrient samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2008 - 2009.

HUC	0410001112-02		
Location	Beaver Creek at Clyde PWS Intake	Beaver Creek at Clyde PWS Intake	Beaver Creek at Clyde PWS Intake
River Mile	RM 2.88	RM 2.88	RM 2.88
Date Sampled	5/22/2008	6/12/2008	5/18/2009
Pesticides & other organic compounds (ug/l)			
Acetochlor	<0.22 R	2.62 J	0.43
Alachlor	<0.22 R	<0.23 UJ	<0.21
Atrazine	0.29 R	8.34 J	0.69
Benzo[a]pyrene	<0.56 R	<0.57 UJ	<0.53
bis(2-Ethylhexyl)adipate	<0.56 R	<0.57 UJ	<0.53
bis(2-Ethylhexyl)phthalate	1.41 R	1.02 B	1.31 J
Butachlor	<0.22	<0.23 UJ	<0.21
Metolachlor	0.34 R	1.77 J	<0.21
Metribuzin	<0.22 R	<0.23 UJ	0.47
Pentachlorophenol	<5.6 R	<5.71 UJ	<5.29
Propachlor	<0.22 R	<0.23 UJ	<0.21
Simazine	<0.22 R	<0.23 UJ	<0.21
Glyphosate	<5.0	<5.0	<5.0
2,4,5-TP	NS	NS	<0.22
2,4-D	NS	NS	6.50
Acinfluorfen	NS	NS	<0.22
Dalapon	NS	NS	<0.22
Dicamba	NS	NS	<0.22
Dinoseb	NS	NS	<0.22
Picloram	NS	NS	<0.22
Nutrients (mg/L)			
Nitrate-Nitrite	4.16	13.3	4.84
Ammonia	<0.050	NS	NS

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

NS – Not sampled.



Appendix N. Surface water results for pesticides and nutrient samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2008 - 2009.

HUC	0410001113-02	
Location	Sandusky R at Rice Rd	Sandusky R at Rice Rd
River Mile	RM 20.25	RM 20.25
STORET ID	500820	500820
Date Sampled	5/22/08	6/12/08
Pesticides & other organic compounds (ug/l)		
Acetochlor	<0.22 R	2.91
Alachlor	<0.22 R	<0.23
Atrazine	0.72 R	<0.23
Benzo[a]pyrene	<0.55 R	<0.58
bis(2-Ethylhexyl)adipate	<0.55 R	<0.58
bis(2-Ethylhexyl)phthalate	0.93 R	0.78 B
Butachlor	<0.22 R	<0.23
Metolachlor	0.35 R	5.00
Metribuzin	<0.22 R	0.60
Pentachlorophenol	<5.5 R	<5.75
Propachlor	<0.22 R	<0.23
Simazine	<0.22 R	<0.23
Glyphosate	<5.0	<5.0
Nutrients (mg/L)		
Nitrate-Nitrite	4.74	9.20
Ammonia	<0.050	NS

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

NS – Not sampled.

## Appendix N. Surface water results for pesticides and nutrient samples collected in the Lower Sandusky River Basin and Sandusky Bay Tributaries during 2008 - 2009.

HUC	0410001113-02			
Location	Sandusky R Just Upst Ballville Dam	Sandusky R Just Upst Ballville Dam	Sandusky R Just Upst Ballville Dam	Sandusky R Just Upst Ballville Dam
River Mile	RM 18.05	RM 18.05	RM 18.05	RM 18.05
STORET ID	U04T02	U04T02	U04T02	U04T02
Date Sampled	5/22/08	6/12/08	5/18/09	6/1/09
Pesticides & other organic compounds (ug/l)				
Acetochlor	<0.22	3.56 J	0.49	5.27
Alachlor	<0.22	0.37 J	<0.21	<0.21
Atrazine	0.88	9.72 J	1.18	16.5
Benzo[a]pyrene	<0.54	<0.52 UJ	<0.51	<0.53
bis(2-Ethylhexyl)adipate	<0.54	<0.52 UJ	<0.51	<0.53
bis(2-Ethylhexyl)phthalate	1.31 B	<0.52 UJ	0.62 B	0.62 B
Butachlor	<0.22	<0.21 UJ	<0.21	<0.21
Metolachlor	0.62	3.63 J	1.50	6.22
Metribuzin	<0.22	<0.21 UJ	0.53	0.48
Pentachlorophenol	<5.4	<5.21 UJ	<5.13	<5.32
Propachlor	<0.22	<0.21 UJ	<0.21	<0.21
Simazine	<0.22	1.00 J	<0.21	0.59
Glyphosate	<5.0	<5.0	NS	NS
Nutrients (mg/L)				
Nitrate-Nitrite	4.75	7.75	5.87	11.4
Ammonia	0.057	NS	NS	NS

J – the analyte was positively identified, the associated value is estimated.

UJ - Analyte was not detected above the quantitation limit which is estimated.

B – the result is estimated. Analyte was detected in the associated blank as well as in the sample.

NS – Not sampled.

## **Appendix O – Fish Consumption Advisory Results**

Appendix O. Fish tissue results for Sandusky Bay Tributaries, 2009.

Location	Species	Sample Type	Cd	Pb	As	Se	Hg	DDD	DDE
Raccoon Cr. Res.	Largemouth Bass	SFF	ND	ND	0.114	0.405	0.057	ND	ND
Raccoon Cr. Res.	Channel Catfish	SFF	ND	ND	ND	0.329	ND	ND	ND
Raccoon Cr. Res.	Brown Bullhead	SFF	ND	ND	ND	0.345	0.097	ND	ND
Beaver Cr. Res.	Largemouth Bass	SFFC	ND	ND	ND	0.549	0.256	ND	ND
Beaver Cr. Res.	Bluegill Sunfish	SFFC	ND	ND	ND	0.545	0.078	ND	ND
Beaver Cr. Res.	Saugeye	SFF	ND	ND	ND	0.55	0.395	ND	ND
Beaver Cr. Res.	Largemouth Bass	SFFC	ND	ND	ND	0.553	0.143	ND	ND
Beaver Cr. Res.	Channel Catfish	SFF	ND	ND	ND	0.363	0.097	ND	ND
Raccoon Cr.	Common Carp	SFFC	0.0048	ND	ND	0.62	0.125	ND	16.7
Raccoon Cr.	Creek Chub	WB	0.096	ND	ND	0.628	0.019	ND	58
Raccoon Cr.	Creek Chub	WBC	0.0417	0.04	ND	0.689	0.051	ND	55.8
Green Cr.	Creek Chub	WBC	0.0406	ND	ND	0.491	0.036	ND	ND
Mills Cr.	White Sucker	WBC	0.0108	0.075	ND	0.723	0.055	ND	ND
Mills Cr.	Creek Chub	WBC	0.022	0.049	ND	0.669	0.083	ND	ND
Mills Cr.	White Sucker	SFF	0.106	ND	ND	0.672	0.104	ND	ND
Mills Cr.	Common Carp	SFFC	0.0069	ND	ND	0.622	0.042	ND	ND
Beaver Cr.	White Sucker	SFFC	0.0047	ND	ND	0.573	0.043	ND	ND
Beaver Cr.	Creek Chub	WBC	0.0183	ND	ND	0.45	0.06	ND	ND
Beaver Cr.	Creek Chub	WBC	0.0119	ND	ND	0.519	0.09	ND	ND
Pickrel Cr.	White Sucker	SOFC	0.0223	ND	ND	0.571	0.077	ND	13.5
Raccoon Cr.	Yellow Bullhead	WB	0.0549	0.046	ND	0.62	0.03	ND	38.6
Raccoon Cr.	Common Carp	SFFC	ND	ND	ND	0.667	0.15	ND	15.9
Sandusky R.	Smallmouth Buffalo	SFFC	ND	0.083	0.11	0.523	0.076	ND	21.8
Sandusky R.	Common Carp	SFFC	ND	ND	ND	0.571	0.044	12.1	39.4
Sandusky R.	Yellow Bullhead	SFFC	ND	ND	ND	360	0.203	ND	ND
Sandusky R.	Largemouth Bass	SFFC	ND	ND	ND	0.702	0.245	ND	ND
Sandusky R.	Common Carp	SFFC	ND	ND	0.132	0.622	0.224	ND	ND
Sandusky R.	Yellow Bullhead	SFFC	ND	ND	ND	0.375	0.117	ND	ND
Sandusky R.	Smallmouth Buffalo	SFFC	ND	ND	ND	0.588	0.165	ND	25.8
Sandusky R.	Bigmouth Buffalo	SFFC	ND	ND	0.204	0.481	0.037	ND	ND
Sandusky R.	Common Carp	SFFC	ND	ND	ND	0.665	0.119	14	50.9
Sandusky R.	Smallmouth Buffalo	SFF	ND	0.135	0.053	0.493	0.058	ND	ND
Sandusky R.	Common Carp	SFFC	0.0056	0.059	0.109	0.883	0.088	ND	32

Appendix O. Fish tissue results for Sandusky Bay Tributaries, 2009.

Location	Species	Sample Type	HCB	1254	1260	Dieldrin	Pentachlorophenol
Raccoon Cr. Res.	Largemouth Bass	SFF	ND	ND	ND	ND	ND
Raccoon Cr. Res.	Channel Catfish	SFF	ND	ND	ND	ND	ND
Raccoon Cr. Res.	Brown Bullhead	SFF	ND	ND	ND	ND	ND
Beaver Cr. Res.	Largemouth Bass	SFFC	ND	ND	ND	ND	ND
Beaver Cr. Res.	Bluegill Sunfish	SFFC	ND	ND	ND	ND	ND
Beaver Cr. Res.	Saugeye	SFF	ND	ND	ND	ND	ND
Beaver Cr. Res.	Largemouth Bass	SFFC	ND	ND	ND	ND	ND
Beaver Cr. Res.	Channel Catfish	SFF	ND	ND	ND	ND	ND
Raccoon Cr.	Common Carp	SFFC	ND	101	ND	ND	ND
Raccoon Cr.	Creek Chub	WB	ND	214	118	17.7	ND
Raccoon Cr.	Creek Chub	WBC	ND	199	96.1	14.1	ND
Green Cr.	Creek Chub	WBC	ND	ND	ND	ND	ND
Mills Cr.	White Sucker	WBC	ND	ND	ND	11.6	ND
Mills Cr.	Creek Chub	WBC	ND	ND	ND	ND	2.4
Mills Cr.	White Sucker	SFF	ND	ND	ND	ND	ND
Mills Cr.	Common Carp	SFFC	ND	ND	ND	10	ND
Beaver Cr.	White Sucker	SFFC	ND	ND	ND	ND	ND
Beaver Cr.	Creek Chub	WBC	ND	ND	ND	ND	ND
Beaver Cr.	Creek Chub	WBC	ND	ND	ND	ND	ND
Pickrel Cr.	White Sucker	SOFC	ND	ND	ND	20.2	ND
Raccoon Cr.	Yellow Bullhead	WB	ND	158	85.7	10.2	ND
Raccoon Cr.	Common Carp	SFFC	ND	75.7	ND	ND	ND
Sandusky R.	Smallmouth Buffalo	SFFC	ND	132	205	25.1	NA
Sandusky R.	Common Carp	SFFC	ND	209	412	20.2	NA
Sandusky R.	Yellow Bullhead	SFFC	ND	ND	ND	ND	NA
Sandusky R.	Largemouth Bass	SFFC	ND	ND	ND	ND	NA
Sandusky R.	Common Carp	SFFC	ND	ND	ND	ND	NA
Sandusky R.	Yellow Bullhead	SFFC	ND	ND	54.6	ND	NA
Sandusky R.	Smallmouth Buffalo	SFFC	ND	135	376	12.3	NA
Sandusky R.	Bigmouth Buffalo	SFFC	ND	ND	ND	ND	NA
Sandusky R.	Common Carp	SFFC	ND	254	590	22.5	NA
Sandusky R.	Smallmouth Buffalo	SFF	ND	ND	ND	ND	NA
Sandusky R.	Common Carp	SFFC	ND	127	418	12.4	NA

Appendix O. Fish tissue results for Sandusky Bay Tributaries, 2009.

<b>Location</b>	<b>Species</b>	<b>Sample Type</b>	<b>Cd</b>	<b>Pb</b>	<b>As</b>	<b>Se</b>	<b>Hg</b>	<b>DDD</b>	<b>DDE</b>
Sandusky R.	Bluegill Sunfish	SFFC	ND	ND	ND	0.658	0.039	ND	ND
Sandusky R.	Largemouth Bass	SFF	ND	ND	0.103	0.537	0.075	13.6	44.4
Muskellunge Cr.	Common Carp	SFFC	0.0048	ND	ND	0.995	0.11	ND	22.1
Muskellunge Cr.	Largemouth Bass	SFF	ND	ND	ND	0.87	0.139	ND	ND
Muskellunge Cr.	Rock Bass	SFFC	ND	ND	ND	0.898	0.217	ND	ND
Muskellunge Cr.	Yellow Perch	SFF	0.0074	ND	ND	1.03	0.11	ND	ND
Muddy Cr.	Largemouth Bass	SFF	ND	ND	ND	0.775	0.099	ND	ND
Muddy Cr.	Common Carp	SFFC	ND	ND	ND	0.851	0.112	ND	12.4
Muddy Cr.	Freshwater Drum	SFFC	ND	ND	ND	1.17	0.257	ND	ND
Muddy Cr.	Largemouth Bass	SFFC	ND	ND	0.119	0.575	0.234	ND	ND
Muddy Cr.	Freshwater Drum	SFFC	ND	ND	ND	0.658	0.042	ND	ND
Muddy Cr.	Common Carp	SFFC	ND	ND	ND	1	0.096	ND	ND

Appendix O. Fish Tissue results for Sandusky Bay Tributaries, 2009.

<b>Location</b>	<b>Species</b>	<b>Sample Type</b>	<b>HCB</b>	<b>1254</b>	<b>1260</b>	<b>Dieldrin</b>	<b>Pentachlorophenol</b>
Sandusky R.	Bluegill Sunfish	SFFC	ND	ND	ND	ND	NA
Sandusky R.	Largemouth Bass	SFF	ND	248	383	21.1	NA
Muskellunge Cr.	Common Carp	SFFC	ND	77.8	171	ND	NA
Muskellunge Cr.	Largemouth Bass	SFF	ND	ND	ND	ND	NA
Muskellunge Cr.	Rock Bass	SFFC	ND	ND	ND	ND	NA
Muskellunge Cr.	Yellow Perch	SFF	ND	ND	ND	ND	NA
Muddy Cr.	Largemouth Bass	SFF	ND	ND	ND	ND	NA
Muddy Cr.	Common Carp	SFFC	ND	ND	130	ND	NA
Muddy Cr.	Freshwater Drum	SFFC	ND	ND	ND	ND	NA
Muddy Cr.	Largemouth Bass	SFFC	ND	ND	ND	ND	NA
Muddy Cr.	Freshwater Drum	SFFC	ND	ND	ND	ND	NA
Muddy Cr.	Common Carp	SFFC	ND	ND	57.2	ND	NA