APPENDIX

Biological and Water Quality Study of the Raccoon Creek, 2016

Athens, Gallia, Hocking, Jackson, Meigs and Vinton Counties

August 2019
Ohio EPA Technical Report EAS/2017-XX-XX

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Appendix A — 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 and Gallant 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*. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio.

____ 1987b. Biological criteria for the protection of aquatic life: Volume II. *User's manual for biological field assessment of Ohio surface waters*. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio.

____ 1989a. Addendum to Biological criteria for the protection of aquatic life: Volume II. *User's manual for biological field assessment of Ohio surface waters*. Division of Water Quality Planning and Assessment, Ecological Assessment Section, Columbus, Ohio.

____ 1989b. Biological criteria for the protection of aquatic life: Volume III. *Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities*. Division of Water Quality Planning and Assessment, Ecological Assessment Section, Columbus, Ohio.

____ 1990. *The use of biological criteria in the Ohio EPA surface water monitoring and assessment program*. Division of Water Quality Planning and Assessment, Ecological Assessment Section, Columbus, Ohio.

Rankin, E.T. 1989. *The qualitative habitat evaluation index (QHEI): rationale, methods, and application*. Division of Water Quality Planning and Assessment, Ecological Assessment Section, 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.E. 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.

Ohio Environmental Protection Agency. 2006. *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 Division of Surface Water, Ecological Assessment Section., Groveport, Ohio.

____ 2015a. 2015 Updates to Biological criteria for the protection of aquatic life: Volume II and Volume II Addendum. *User's manual for biological field assessment of Ohio surface waters*. Division of Surface Water, Ecological Assessment Section, Columbus, Ohio. May 8, 2015.

____ 2015b. *Biological criteria for the protection of aquatic life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities*. Division of Surface Water, Ecological Assessment Section, Columbus, Ohio. September 23, 2015.

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. 1995. 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. 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. and E.T. Rankin. 1995c. 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 contacting:

Ohio EPA, Division of Surface Water
Ecological Assessment Section
4675 Homer Ohio Lane
Groveport, Ohio 43125
(614) 836-8798

References

Karr, J. R. 1991. *Biological integrity: A long-neglected aspect of water resource management*. Ecological Applications 1(1): 66-84.

Karr, J.R., K.D. Fausch, P.L. Angermier, P.R. Yant, and I.J. Schlosser. 1986. *Assessing biological integrity in running waters: a method and its rationale*. Ill. Nat. Hist. Surv. Spec. Publ. 5. 28 pp.

MacDonald, D., C. Ingersoll, T. Berger. 2000. *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*. Arch. Environ. Contam. Toxicol.: Vol.39, 20-31.

Miltner, R.J. and E.T. Rankin. 1998. *Primary Nutrients and the Biotic Integrity of Rivers and Streams*. Freshwater Biology 40:145-158.

Miner R. and D. Borton. 1991. *Considerations in the Development and Implementation of Biocriteria, Water Quality Standards for the 21st Century*, U.S. EPA, Offc. Science and Technology, Washington, D.C., 115.

Ohio Environmental Protection Agency. 2015a. 2015 Updates to Biological criteria for the protection of aquatic life: Volume II and Volume II Addendum. *User's Manual for Biological Field Assessment of Ohio Surface Waters*. Division of Surface Water, Ecological Assessment Section, Columbus, Ohio. May 8, 2015.

____ 2015b. Biological criteria for the protection of aquatic life: Volume III. *Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities*. Division of Surface Water, Ecological Assessment Section, Columbus, Ohio. September 23, 2015.

____ 2015c. *Surface water field sampling manual for water column chemistry, bacteria and flows*. Version 5.0, July 31, 2015. Division of Surface Water, Columbus, Ohio. 41pp. ***epa.ohio.gov/dsw/document_index/docindx.aspx***

____ 2012. *Sediment sample guide and methodologies*. Third Edition. Division of Surface Water, Columbus, Ohio. 39 pp.

____ 2008. *Sediment Reference Values*. Division of Emergency and Remedial Response. Columbus, Ohio.

____ 2006. *Methods for assessing habitat in flowing waters: Using the Qualitative Habitat Evaluation Index (QHEI)*. Ohio Technical Bulletin, EAS/2006-06-1. Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.

____ 1989a. Addendum to biological criteria for the protection of aquatic life: Volume II. *User's manual for biological field assessment of Ohio surface waters*. Division of Water Quality Planning and Assessment, Surface Water Section, Columbus, Ohio.

____ 1989b. Biological criteria for the protection of aquatic life: Volume III. *Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities*. Division of Water Quality Planning and Assessment, Columbus, Ohio.

____ 1987a. Biological criteria for the protection of aquatic life: Volume I. *The role of biological data in water quality assessment*. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio.

____ 1987b. Biological criteria for the protection of aquatic life: Volume II. *User's manual for biological field assessment of Ohio surface waters*. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio.

Omernik, J.M. and A.L. Gallant. 1988. *Ecoregions of the upper midwest states*. EPA/600/3-88/037. U. S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, Oregon. 56 pp.

Rankin, E.T. 1995. Habitat Indices in Water Resource Quality Assessments, in W.S. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Risk-based Planning and Decision Making*. CRC Press/Lewis Publisher, Ann Arbor.

Rankin, E.T. 1989. *The qualitative habitat evaluation index (QHEI): rationale, methods, and application*. Division of Water Quality Planning and Assessment, Ecol. Assess. Sect., Columbus, Ohio.

Suter, GW II. 1993. *A Critique of Ecosystem Health Concepts and Indexes*. Environmental Toxicology and Chemistry, 12: 1533-1539.

U.S. EPA. 2003. *Final technical approach for developing ecological screening levels for RCRA Appendix IX constituents and other significant contaminants of ecological concern*. United States Environmental Protection Agency Region 5, Chicago, IL. August 2003.

Yoder, C.O. 1995. Policy issues and management applications of biological criteria, in W.S. Davis and T. Simon (eds.). *Biological Assessment and Criteria: Tools for Risk-based Planning and Decision Making*. CRC Press/Lewis Publishers, Ann Arbor.

Yoder, C.O. 1991. Answering some concerns about biological criteria based on experiences in Ohio, *in* G. H Flock (ed.) *Water quality standards for the 21st century*. Proceedings of a National Conference, U. S. EPA, Office of Water, Washington, D.C.

Yoder, C.O. 1989. *The development and use of biological criteria for Ohio surface waters*. U.S. EPA, Criteria and Standards Div., Water Quality Stds. 21st Century, 1989: 139-146.

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. and E.T. Rankin. 1995c. 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.

Appendix B — NPDES Facility Descriptions, Comprehensive NPDES Facility List

NPDES Appendix

The Raccoon Creek watershed has a total of twenty individual National Pollutant Discharge Elimination System (NPDES) permitted facilities that discharge treated wastewater from sanitary wastewater plants and industrial facilities. The sanitary wastewater is from twelve wastewater treatment plants serving the City of Wellston, five villages (Zaleski, McArthur, Hamden, Vinton and Rio Grande), two mobile home parks, one subdivision (Rodney Village) and one State Park (Lake Hope). The industrial facilities include a coal processing plant, a natural-gas power plant, landfill, an explosives manufacturer, food processing plant and public drinking water plants (Table 1).

Table 1: Facilities regulated by an individual NPDES permit within the Raccoon Creek Study Area

Facility Name	Ohio EPA Permit No.	Receiving Stream	River Mile	Description
Village of Zaleski WWTP	0PA00112	Raccoon Creek	97.1	30, 000 GPD Extended Aeration Package Plant
ODNR Lake Hope State Park Lodge	0PP00066	UNT Sand Run	0.6	30, 000 GPD Extended Aeration Package Plant
Pearl Graham dba Pine Meadow WWTP	0PV00033	UNT Grass Run	0.58	2,250 GPD Package Plant
Austin Powder Company	0IF00003	UNT Raccoon Creek	98.96	Outfalls 001, 005 and 010 Sanitary and Process Wastewater
Austin Powder Company	0IF00003	UNT Elk Fork	11.17	Outfalls 003, 006, 007 and 010 Storm Water, Sanitary and Process Wastewater
McArthur WWTP	0PB00080	Puncheon Fork	15	0.494 MGD Facilitative Lagoons
Industrial Timber and Land Co. - Northwest Hardwoods	0IN00114	UNT McConnels Run	1.22	Storm Water
West Virginia Resources Inc - Dundas Prep Plant	0IL00075	Pierce Run	7.4	Storm Water
Sands Hill Mining LLC - Sands Hill Coal Preparation Plant	0IL00074	Sugar Run	1.32, 1.6 and 1.9	Storm Water
Wellston Public Water System - North Plant	0IV00120	Little Raccoon Creek	29.97	Settling, Filtration, Disinfection and De-chlorination
Hamden WWTP	0PB00089	Sand Run	1.72	125,000 GPD Membrane Bioreactor
General Mills Inc. - Wellston Plant	0IH00046	Meadow Run	2.8 and 3.18	360,000 GPD biological Lagoons and Settling. NCCW
Wellston North WWTP	0PC00013	Meadow Run	1.17	1.44 MGD Vertical Loop Reactor, Secondary Clarification and UV Disinfection
Rumpke Waste Beech Hollow Landfill	0IN00169	UNT Little Raccoon Creek and UNT Mulga Run	27.83 2.81	Storm Water and AMD Neutralization
CONSOL Mining Co., LLC; Division Office Building	0IM00003	Brush Fork	2.52	4,000 GPD Package Plant
Rolling Hills Generating, LLC; Rolling Hills Generating Station	0IB00036	UNT Flatlick Run	3.58	Storm Water and Oil Water Separator
Village of Vinton WWTP	0PA00019	Raccoon Creek	39.72	45,000 GPD Extended Aeration Plant

Facility Name	Ohio EPA Permit No.	Receiving Stream	River Mile	Description
Bidwell Porter WWTP	0PG00068	UNT Barren Creek	1.42	97,000 GPD Aerated Facultative Lagoons
Village of Rio Grande WWTP	0PB00035	Indian Creek	1.45	0.160 MGD Oxidation Ditch, Secondary Clarifiers and Disinfection
Rodney Village No 2 WWTP	0PG00054	Ryan Run	2.52	24,000 GPD Extended Aeration Plant
Quail Creek MHP WWTP	0PV00002	UNT Mud Run	4.3	22,000 GPD Extended Aeration Plant

The Raccoon Creek watershed also has thirty general NPDES permits. General NPDES permits are one permit that covers numerous facilities that have similar operations and type of discharge. There are twelve coal surface mining permits, all within Vinton County, two petroleum related corrective action permits, one hydrostatic test water permit for testing gas pipelines, one water treatment plant discharge permit, eight industrial storm water permits mostly related to forestry products and six sanitary discharge permits for small wastewater treatment facilities.

Home Sewage Treatment Systems

Home Sewage Treatment Systems (HSTS) are common throughout the rural parts of Ohio. The Southeast District of Ohio EPA has received numerous complaints regarding failing home septic systems or the lack of HSTS. In some instances, multiple homes are connected to one septic system and in other cases no treatment is provided. Many of these systems are installed without local health department or Ohio EPA approval. Additionally, land application of septage, without approval, is a reoccurring problem. Ohio EPA has issued approximately thirteen HSTS general permits within the Raccoon Creek watershed. The Raccoon Creek Management Plan (Ohio University, 2003) documented approximately 3,380 HSTS or cesspools within the Raccoon Creek watershed. The local health departments estimate that about half (1619 systems) of these are failing or in need of significant maintenance. Vinton County Health Department estimates that 80% or 2,186 HSTS, within the entire county, are failing or in need of maintenance. Failing HSTS can be a leading cause of bacterial and nutrient issues within the watershed.

NPDES Permitted Dischargers

Village of Zaleski WWTP (Ohio EPA Permit # 0PA00112; outfall 001)

Due to unsanitary conditions, the Village of Zaleski installed a central sanitary sewer system and wastewater treatment plant (WWTP) which became operational in 2015. Before 2015, the Village of Zaleski residents were served by home septic systems which, in 2008, the Vinton County Health Department estimated that nearly 50% of those systems were failing. The Village of Zaleski's WWTP is located at John Street, Zaleski, Vinton County. The WWTP is designed to treat 30,000 gallons per day (GPD) of domestic sanitary wastewater. The plant is a package plant with chlorination and de-chlorination. The WWTP discharges to a Village storm sewer and then to Raccoon Creek at RM 97.1. The plant serves 152 homes (375 residents) as well as businesses. Discharge Monitoring Report (DMR) data submitted monthly by the Village of Zaleski had

numerous NPDES permit limit violations for the review period of September 2015 through December 2016. The plant violated the NPDES permit limits 18 times for 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) and 44 times for ammonia (NH_3). Dissolved oxygen, *E. coli* and total suspended solids (TSS) limits were violated to a lesser extent. Half the limits violations occurred during the four-month start-up period in 2015.

ODNR Lake Hope State Park Lodge (Ohio EPA Permit # 0PP00066; outfall 002)

The Lake Hope State Park Lodge WWTP is located near the entrance of Park Road 1, off State Route 278. This is the entrance road to the lodge and cabin areas. The WWTP is a 30,000 GPD extended aeration package plant with UV disinfection. The plant serves the lodge, dining lodge and 37 cabin areas with an estimated 75 people population. The permits serving the beach area and Cabin Ridge Road cabins (0PP00073 and 0PP00067, respectively) have been revoked due to Lake Hope State Park installing a pump station to deliver the sanitary wastewater from these areas to the lodge WWTP. The WWTP discharges to an unnamed tributary to Sand Run (enters Sand Run at RM 0.56) at RM 0.6. Monthly DMR data reveal that outfall 001 WWTP had sixteen NPDES permit limit violations for the review period of January 2012 to December 2016. The violations were for $CBOD_5$, TSS, pH and NH_3.

Pearl Graham dba Pine Meadow MHP (Ohio EPA Permit # 0PV00033; outfall 001)

The Pine Meadows Mobile Home Park (MHP) is located at 2680 State Route 56, New Marshfield, Athens County. The WWTP at Pine Meadows is designed to treat 2,250 GPD of sanitary wastewater. The plant consists of trash trap, package plant and disinfection. As many as six trailers are currently in the park. The plant discharges to an unnamed tributary to Grass Run (enters at RM 0.31) at RM 0.58.

On August 22nd, 2017 Ohio EPA conducted a compliance sampling inspection and observed many issues that need to be resolved for better treatment. The aeration blowers were running but aeration distribution within the tank was limited to the exit end of the tank and inadequate and grease balls were observed floating in the tank. The clarifier color was light brownish, yet clear in nature with no apparent settling taking place. There were sand filters or de-chlorination unit but no Cl2 pucks visible in the chlorine chamber. The plant had a septic odor and the effluent was a turbid brownish color. A gray colored fungus was noted in the effluent pipe and on the small gravel rip-rap at the end of the pipe. A compliance sample collected by Ohio EPA documented NPDES permit violations for ammonia (result-35.7 mg/L, permit limit -2.3 mg/L), $CBOD_5$ (result - 46.7 mg/L, permit limit -15 mg/L), TSS (result - 39.0 mg/L, permit limit - 18 mg/L), fecal coliform (result - 80,000 cfu, permit limit -2000 cfu) and dissolved oxygen (result - 1.75 mg/L, permit limit ≥ 6.0 mg/L)

Monthly DMR data submitted by the MHP from January 2012 to December 2016 reported that outfall 001 WWTP only had 10 NPDES permit limit violations in June 2013. The compliance sample and inspection by Ohio EPA in 2016 seems to indicate that the plant is not operating properly nor are they submitting valid DMR data.

Austin Powder Company; Red Diamond Plant (Ohio EPA Permit # 0IF00003; outfalls 001, 003, 005, 006, 007, 010 and 011)

The Austin Powder Company is located at 430 Powder Plant Road, State Route 667, McArthur, Vinton County. The Red Diamond Plant opened in the early 1930's and is the core manufacturing operation for Austin Powder Company. The plant is an explosive manufacturing facility that manufactures industrial explosives and accessories and provides technical and blasting services to its customers. Austin Powder, Red Diamond, employs 200 people and operates three shifts per day. The Red Diamond complex covers approximately 1900 acres with many individual buildings spread-out over a large area to isolate each activity from potential explosion. Because of the distance between the buildings, many are served by many small WWTPs or storm water ponds which discharge to tributaries to Raccoon Creek and Elk Fork.

Explosives handled at Red Diamond are composed of ammonium, nitrate, nitroamine compounds, trinitrotoluene, fuel oils and other many other compounds in a much lesser amount. Penthrite (PETN) is structurally very similar to nitroglycerin and is manufactured at Red Diamond. The explosives are all nitrogen-based compounds which when released into an aquatic environment can have negative impacts on the aquatic biology. Much of the waste generated at Red Diamond is treated off site or, in the case of solids, some are incinerated on site.

One of the significant NPDES discharges at Austin Powder is the Bangalore Booster Line at outfall 001. At Bangalore, commercial explosives are load assembled and packed. Water is used to maintain wet floor conditions to reduce static electricity throughout production operations. Water used in the booster and detonating cord production is pre-treated with settling micro-straining and carbon absorption before being comingled with shower house, laundry, and sanitary wastewater. The comingled wastewater is then treated in an extended aeration WWTP with sand filters. The Bangalore plant discharges to an unnamed tributary to Raccoon Creek (enters Raccoon Creek at RM 98.96) at RM 0.9.

Austin Powder has three extended aeration plants with sand filters for treating sanitary wastewater only (outfalls 003, 005 and 006). The breakroom WWTP with outfall 004 has been replaced by a septic tank and leach field. Outfall 007 is a one-acre storm water retention pond which collects storm water from the administrative and maintenance building area and a vehicle wash station. Outfalls 003, 006 and 007 discharge to an unnamed tributary to Elk Fork (enters Elk Fork at RM 11.17). Outfalls 005 discharges to an unnamed tributary to Raccoon Creek (enters Raccoon Creek at RM 98.96.

Outfall 010 is a new booster line facility built in 2008 which produces and treats wastewater like the Bangalore plant (outfall 001) but also has UV disinfection. Outfall 010 discharges to an unnamed tributary (enters Raccoon Creek at RM 98.96) at RM 0.8. In 2016, a new PETN Process facility (outfall 011) was put into operation. Boiler blowdown and cooling tower blowdown waters, along with wastewater from the solids recovery system go to a biological treatment plant. Treatment of the PETN process wastewater includes screening of solids, neutralization, nitrification/denitrification, chemical oxidation, and slow sand filters before discharge. The sludge from the plant is aerobically digested and then incinerated on site. The PETN Process facility WWTP discharge to an unnamed tributary to Elk Fork (enters Elk Fork at RM 11.17) at RM 1.5.

DMR data submitted monthly by Austin Powder for outfall 001 had numerous NPDES permit limit violations for the review period of January 2012 to December 2016. Most of the violations were for

$CBOD_5$ and chemical oxygen demand (COD). Outfall 003 had fifteen total suspended solids (TSS) violations while outfall 005 had five $CBOD_5$ and nine TSS violations for the same review period. The new treatment facilities for outfall 010 had 72 NPDES permit violations, mostly ammonia (NH_3) and $CBOD_5$ for the same review period and outfall 011 had two TSS and four $CBOD_5$ violations in 2016. The compliance status of Austin Powder is under review by Ohio EPA and US EPA.

Village of McArthur WWTP (Ohio EPA Permit # 0PB00080: outfall 001)

The Village of McArthur's WWTP is located on Barleon Road, McArthur, Vinton County. The WWTP was originally built in 1960 and consisted of two, five-acre, facilitative lagoons, bar screen which discharged to Elk Fork at RM 15.0. In 1992, a major plant modification occurred which involved the installation of sewage grinder, flow equalization tank (EQ tank), four aerated lagoons, rock filter and a pump station installed to move the discharge location from Elk Fork, a State Resource Water (SRW), to Puncheon Fork, which was impacted by acid mine drainage (AMD). The WWTP has a design flow of 494,000 GPD. The sanitary sewer system is 100% separated with no storm sewer connections however, inflow and infiltration (I/I) is a problem with an estimated 14,000 GPD entering the collection system. The sanitary collection system has a bypass located at Veterans Memorial Drive Pump Station EQ tank to Puncheon Fork. The WWTP serves approximately 2400 residents, the Vinton County High, Twin Maples Nursing Home and Vinton County Industrial Park. There are no major industrial dischargers to the WWTP.

The sanitary sewer collection system has experienced numerous sanitary sewer overflows (SSO) of untreated sewage to Puncheon Fork within the Village of McArthur. In 2009 and 2011, SSOs occurred due to clogged or blocked sanitary sewers lines. In 2016 a break in the sanitary sewer line occurred resulting in raw sewage being discharge to Puncheon Fork near the pump station. Ohio EPA has occasionally received complaints of raw sewage in a ditch or creek within the village and determined that either businesses or residents were not connected to the centralized sewers. As these situations are documented, the Village has taken steps to correct the situation.

Ammonia loadings from the McArthur WWTP tend to follow the discharge rate over time. The WWTP has had fluctuating flows between 2000 and 2016, a good indication of the I/I issues. The ammonia loadings were elevated and the annual statics in Figure 1 show that in since 2011 the 50th percentile value is trending down.

Between January 2012 and December 2016, the McArthur WWTP had eleven bacteria, two oil and grease and two pH violations. In July 2013 McArthur WWTP had two TSS and two $CBOD_5$ violations. From January 2012 through December 2016, DMR data show that the WWTP discharge to Puncheon Fork had an average ammonia of 8.47 mg/L. For the same five-year period the WWTP had an average total phosphorus of 2.07 mg/L while discharging an average ammonia loading of 8.15 kg/day. Quarterly sampling in 2016, by the Village of McArthur, at the downstream sampling location (RM 0.802) and the upstream sampling location (RM 0.807) had an average concentration of 5.48 mg/L and 1.19 mg/L, respectively. The upstream sampling during the last three quarters of 2016 show that ammonia ranged from June 2016 at 10.9 mg/L to December 2016 3.58 mg/L. This may be a result of the sewer line break in 2016 mentioned above.

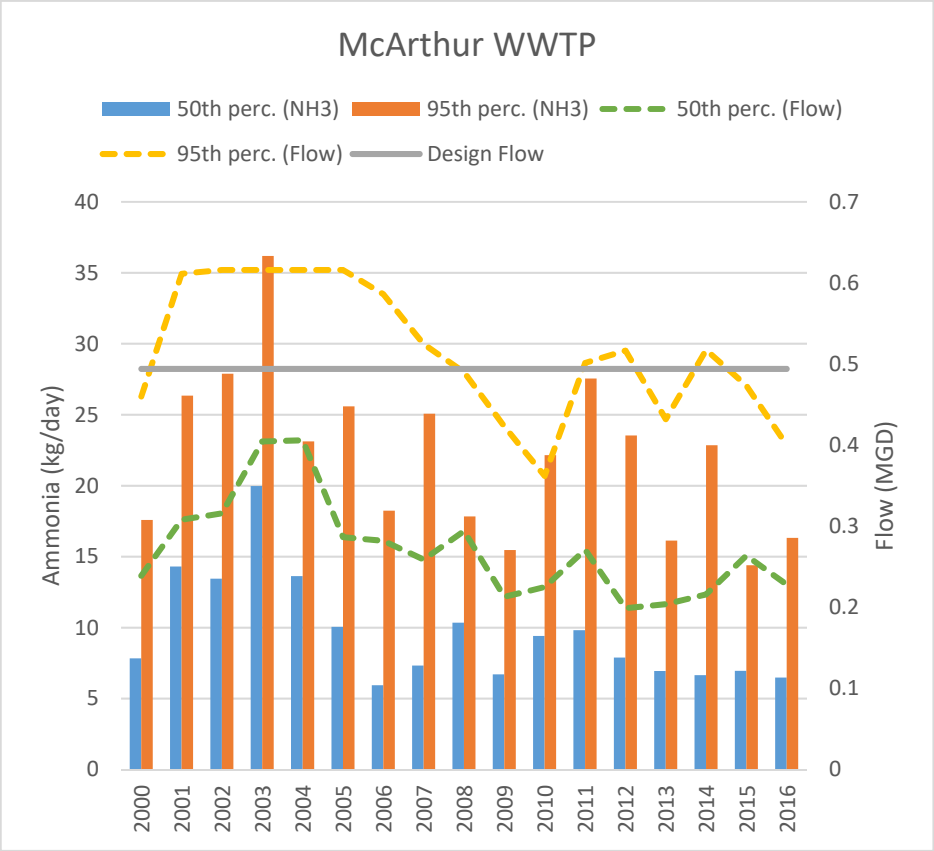

Figure 1: Ammonia annual loadings for McArthur WWTP between 2000 and 2016.

Industrial Timber and Land Company – Northwest Hardwoods (Vinton County Dry Kiln) (Ohio EPA Permit # 0IN00114: outfall 001)

The Northwest Hardwoods facility is located at 35748 State Route 93 South, Hamden, Vinton County and the company is a manufacturer of kiln dried hardwood lumber. Green hardwood lumber is received, graded, stacked on sticks for drying and dried in kilns using steam from wood waste boiler. Storm water from the lumber stacking area, roof drains and parking areas flow to a sedimentation pond before discharging to an unnamed tributary to McConnels Run (enters at RM 1.22) at RM 0.95. No violations were reported between January 2012 through December 2016.

West Virginia Resources, Inc. (Dundus Prep-Plant) (Ohio EPA Permit # 0IL00075; outfall 001)

The Dundus prep-plant is located at 38963 State Route 160 East, Hamden, Vinton County. The facility consists of a weight station and engineer's office building which are served by a septic tank and leach field. Pond 001 uses caustic-soda for pH adjustment and acts a sedimentation pond. The

facility once consisted of a coal prep-plant for washing coal but has not operated since 2006 and has since been demolished. The discharge is to Peirce Run (RM 7.41).

Sands Hill Mining, LLC (Ohio EPA Permit # 0IL00074; outfalls 001, 002 and 003)

Sands Hill Mining is located at 38701 State Route 160, Hamden, Vinton County. The Sands Hill facility has a coal prep-plant for washing coal. The coal is classified by size and readied for various markets. The slurry for the prep-plant is pumped to a slurry impoundment. Slurry impoundment (003) water is used in the prep-plant, the impoundment only discharges during extensive rain events. Storm water from the prep-plant and coal processing areas is collected in ponds 001 and 002 and water from these ponds is used for haul road dust control in the active surface mining sites. In these settling ponds, neutralization is done using soda ash or caustic soda. Pond water is pumped to a large holding cell when water is not needed for mining operates. The objective at Sands Hill is not to have discharges to the streams. Sanitary wastewater is treated on-site. The discharge from outfall 001 is to an unnamed tributary to Sugar Run (enters at RM 1.64) at RM 0.18 and the discharge from 002 is to Sugar Run at RM 1.9 and finally, the discharge from 003 is to an unnamed tributary to Sugar Run enters at RM 1.32 at RM 0.52. All these potential discharges have set monitoring and limit requirements in the NPDES permit. No violations were reported for the review period of January 2012 through December 2016.

City of Wellston Public Water System – North Plant (Ohio EPA Permit # 0IV00120; outfall 001)

The Wellston Water Works North Plant is located at State Route 349, Wellston, Jackson County. The North Plant was built in 1927 and provides potable water to 2,393 service connections (about 6,700 residents) including the Village of Hamden residents. This is a surface water treatment plant. The plant draws water from Lake Alma, Little Raccoon Creek and the Cherrington Hill upland reservoir. The treatment system consists of settling, filtration, fluoridation, disinfection and de-chlorination. Settling involves the use of alum and there is a filter backwash waste stream. The plant discharges to Little Raccoon Creek at RM 29.97. For the review period of January 2012 through December 2016, the Wellston North plant had nine TSS violations at the final 002 outfall and the internal outfall, 601, had three fecal coliform and five TSS permit exceedances.

Village of Hamden WWTP (Ohio EPA Permit #0PB00089; outfall 001)

The Village of Hamden WWTP is located on 260 Young Avenue, Hamden, Vinton County. The WWTP was built in 2007 to serves the 870 residences of Village of Hamden and 100 residences in Clinton Township. The WWTP is designed to treat 0.125 MGD of domestic wastewater. The plant consists of primary screening and grit removal, flow equalization, membrane bioreactor treatment and UV disinfection. The discharge is at RM 1.72 on Sand Run and is within the City of Wellston's drinking water source protection area - corridor management zone. The sanitary sewer collection system has experienced SSO of which both were immediately repaired, and it is believed no untreated sewage reached any waterway. For the review period of January 2012 through December 2016, the WWTP had eleven DO and two *E. coli* violations.

General Mills Inc. Wellston Plant (0IH00046; outfalls 001 and 002)

The General Mills Wellston Plant (formerly known as Jeno's and Pillsbury) is located at 2403 South Pennsylvania Avenue, Wellston, Jackson County. The Wellston facility produces frozen pizza and

pizza-related products and processes/packages frozen vegetables. General Mills distributes all finished goods from an on-site distribution center (frozen storage). Treatment of the food production process water begins with grit removal and screening. Primary clarifiers are then used to capture floating oils and grease and settling. Sanitary wastes and effluent from the initial treatment go to a secondary treatment system of biological lagoons. The first lagoons are aerated and are followed by settling lagoons. An estimated 0.36 MGD of waste water is treated and discharge from only one of three permitted outfalls. These outfalls are labeled 001A, 001B and 001C. All three outfalls are to Meadow Run with outfall 001A discharging at RM 3.1, outfall 001B discharging at RM 2.8 and outfall 001C discharging at RM 1.19. The original outfall was at RM 3.1. Previous owners of the former Jeno's plant operated a 37acre treatment lagoon that from 1991 to 2002 that discharged at RM 1.19, just downstream of the City of Wellston's WWTP discharge (RM 2.0). General Mills abandoned and reclaimed the large lagoons system with a more reliable biological lagoon system and moved the discharge point to the current location at RM 2.8. Outfall 002 is non-contact cooling water only and discharges to Meadow Run at RM 3.18. The facility has six storm waters discharges captured in holding chambers for observation before being discharged to Meadow Run. Some storm water is diverted to the 001-treatment system before being discharged. During the review period of January 2012 through December 2016, the GM facility only had NPDES permit violations from February 2015 through September 2015 which included five $CBOD_5$, six fecal coliform and six ammonia violations.

Wellston North WWTP (Ohio EPA Permit # 0PC00013: outfalls 001 and 300)

The Wellston North WWTP is located at 1100 South Rhode Island Street, Wellston, Jackson County. The Wellston North WWTP was originally built in 1939 and upgraded in 1961. Outfall 001 was located on Meadow Run at RM 1.20 but relocated to RM 1.17 after the most recent upgrade to the WWTP in 1991. Treatment consists of influent pumping, preliminary screening and grit removal, activated sludge – vertical loop reactor, secondary clarification, post aeration and UV disinfection. The 1991 upgrade resulted in an advanced waste water treatment facility with an average designed flow of 1.44 MGD and peak maximum daily flow of 6.5 MGD. This extreme flow variation is attributed to increased flow from infiltration and inflow (I/I) into the city's sanitary sewers and precipitation entering the combined sewers within the city.

There were 29 reported SSO within the City of Wellston from January 2012 to December 2016. The causes of the SSO were clogged sewer lines backing up into resident's basements and overflowing out manholes and lateral cleanouts or equipment failure at sanitary pump stations. The SSO were resolved in all cases by cleaning the sewer lines or performing maintenance at the pump station.

Ohio EPA conducted acute bioassay testing in 2011 and 2016 from the Wellston WWTP. The test organisms included fathead minnows (*Pimephales promelas*) and microcrustacean, *Ceriodaphnia dubia.* The effluent samples from the Wellston WWTP were not acutely toxicity to either test organism.

The city of Wellston conducted five acute and chronic bioassay tests from 2012 through 2016 as part of a requirement of the NPDES permit from the 001 outfall. Mortality in the various dilutions during the acute testing was minimal from 2012 to 2013 and no acute toxicity occurred from 2014 to 2016 for both *C. dubia* and *P. promelas*. No mortality occurred to *P. promelas* during the chronic

testing from 2012 to 2016 but chronic toxicity did occur to *C. dubia* in 2012 (TUc=11.31) and 2014 (TUc=2.83).

The city of Wellston also conducted five acute and chronic bioassay tests (2012-2016) at the upstream 801 monitoring station on Meadow Run. The 801 monitoring station showed both acute and chronic toxicity to *P. promelas* from 2012 to 2015 while only in 2015 did the upstream water have a toxic effect on *C. dubia*.

Throughout the years that Ohio EPA has conducted biological monitoring in Meadow Run, different chemical signatures have kept the biological fish scores below the WWH aquatic life use. Sampling in Meadow Run has shown that nutrients, particularly ammonia, are having a negative effect on the biological community. Table 2 shows that ammonia has decreased from past high values, but it remains well above the target value. Poor habitat and flow within the Meadow Run watershed has contributed to the poor biological scores, but nutrient enrichment is also a large contributor in the lower reach of Meadow Run. Fish survey scores consistently are under performing at the SR 327 (RM 2.16) and Cheatwood Road (RM 0.72) sampling sites. Macroinvertebrates perform less well at the downstream site (Cheatwood Rd.) than the SR 327 site. This in part due, again, to nutrients.

Table 2: Nutrient sample results from Ohio EPA stream monitoring program. The shaded cells indicate values over the 90th percentile.

Location	RM	Ammonia (mg/L)				N-N (mg/L)				Phosphorus (mg/L)			
		Mean				Mean				Mean			
		1984	1995	2007	2016	1984	1995	2007	2016	1984	1995	2007	2016
Meadow Run upstream General Mills	3.1	0.242	0.08	---	0.118	0.079	0.174	---	0.222	0.05	0.0294	---	0.056
Meadow Run @ SR 327	2.08	---	0.29	0.106	0.116	---	0.14	0.218	6.635	---	0.05	7.68	0.147
Meadow Run @ Cheatwood Rd	0.8	6.15	5.605	0.116	0.894	0.344	0.316	4.912	8.34	4.696	1.406	3.652	0.716
Meadow Run @ Mouth	0.01	2.06	---	---	---	20.1	---	---	---	0.76	---	---	---
Reference Values 90th percentile WAP		**0.06**				**0.606**				**0.09**			

During the beginning of the January 2012 through December 2016 review period, the City of Wellston's WWTP had 3 copper NPDES permit violations. Later that year, Wellston had one additional copper violation. October 2012 to the end of the review period Wellston had no additional copper violations. Also during the five-year DMR review, Wellston had 2 ammonia and three TSS permit violations. All violations occurred prior to the 2016 sampling season.

Rumpke Waste Inc., Operator of Beech Hollow Landfill (Ohio EPA Permit # 0IN0016; outfalls 001, 002 and 003)

The Beech Hollow Landfill is located at 28 AW Long Road, Wellston, Jackson County. The landfill is a municipal solid waste disposal landfill. The NPDES permit covers only the storm water construction activities such as excavation, soils crushing and screening and placement of fills and daily cover application to the active landfill area. The three sediment ponds receive storm water from a total of 186 acres. Pond 2 (outfall 002) periodically uses soda ash to neutralize acid mine

drainage. Ponds 002 and 003 discharge to an unnamed tributary to Little Raccoon Creek at RM 27.83. The 001 discharges pond discharges to an unnamed tributary to Mulga Run at RM 2.81. All water that contacts the solid waste is collected and treated off-site. Beech Hollow had eight TSS and two settleable solids violations due to rain events ranging from 0.25" to 1.75" of rain for the review period.

CONSOL Mining Company, LLC; Division Office Building (Ohio EPA Permit # 0IM00003; outfall 001)

The CONSOL Division Office Building is located at State Route 689, Rock Point, Meigs County. The WWTP is a 4,000 GPD package plant with chlorination and dechlorination. The WWTP discharges to Brush Fork at RM 2.52. No violations report for January 2012 through December 2016.

Rolling Hills Generating, LLC (Rolling Hills Generating Station) (Ohio EPA Permit # 0IB00036: outfall 001)

The Rolling Hills Generating Station is located at 43111 State Route 160, Wilksville, Vinton County. The generating station is a combustion gas turbine electric generating peaking plant. The facility has five simple cycle units, each capable of generating 183 mega-watts (MW) of electricity, generating a possible total 915 MWs. Simple cycle combustion turbines have no way to recover/reuse the waste heat initially generated. The facility generates small amounts of process water (air conditioner condensate and fire pump cooling water) and contact storm waters which are treated in an oil-water separator and filtered. The wastewater is then pumped to a 700,000-gallon process water storage tank and used back in the facility operations. Discharges from the storage tank are intermittent and are based on the amount of contact storm water and process water generated. The plant discharges to an unnamed tributary (RM 0.1) of Flatlick Run at RM 3.85. No violations were reported for January 2012 through December 2016 review period.

Village of Vinton WWTP (Ohio EPA Permit # 0PA00019: outfall 001)

The Village of Vinton's WWTP is located south of State Route 160, on the east side of State Route 325, Vinton, Gallia County. The WWTP is a 45,000 GPD activated sludge – extended aeration plant with UV disinfection. The plant serves approximately 375 citizens. The plant treats only domestic sanitary wastewater form light commercial businesses, schools and residents. There are no industrial users within the Village. The WWTP was built in and became operational in 2004. The plant discharges to Raccoon Creek at RM 39.72. In May 2014, the Village found that during flood events, manholes adjacent to Raccoon Creek where inundated with water causing inflow to the WWTP to reach 359,000 GPD. For the next year, the Village found this problem reoccurring in other areas during flooding events. The manholes were sealed as the problems were found. On September 24th, 2014 Ohio EPA was notified by a Vinton resident, that a pump station was discharging raw sewage to a small tributary of Raccoon Creek (which occurred due to a power outage). Ohio EPA notified the Village of the problem and the Village reset the pump station controls and stopped the discharge. The Village posted phone numbers on the pump station so that residents could report issues quickly the WWTP operators. In July 2012, the WWTP experienced a week-long power-outage and had no back-up generator. As a result, wastewater was not able to be treated during this outage. The Village has acquired a back-up generator. There are numerous violations reported for January 2012 through December 2016 DMR review period. The WWTP had

five $CBOD_5$ and had four TSS and two bacteria violations. The WWTP also had issues meeting the weekly average and thirty-day limits for ammonia during the summer months. All eighteen ammonia limit exceedances were during the summer months of May 1st through October 31st.

Gallia County Commissioners Bidwell Porter WWTP (Ohio Permit # 0PG00068: outfall 001)

The Bidwell-Porter WWTP is located at State Route 850, Bidwell, Springfield Township, Gallia County. The WWTP was constructed in 1998 to replace four existing package wastewater treatment plants and approximately 327 failing HSTS and eliminated a building ban on the area. The WWTP is designed to treat 97,000 GPD of domestic sanitary wastewater for 411 residents, schools and light commercial businesses in the communities of Porter and Bidwell, both unincorporated. The WWTP consists of two aerated facultative lagoons (approximately 10 acres total) operated in series, chlorination and dichlorination. The lagoon system with a 180-day storage capacity and a controlled discharge to an unnamed tributary (RM 0.32) to Barren Creek at RM 1.42. There will be no discharge under low stream flow conditions. Discharge will be permitted only when there can be at least a 5:1 Barren Creek flow to discharge flow ratio maintained.

The collection system serving the community of Porter is a Septic Tank Effluent Pump (STEP) system. Each home/business has an on-lot septic tank with built in pump. The water from each tank is pumped to the collection system lines, which are small diameter pressure lines (6", 4", and 3" dia.), and then routed to the treatment lagoon. The STEP system at each home is controlled by one central control system which will turn on and off each tank pump in a programmed interval, allowing optimal use of the collection system capacity. Should the control system fail, the STEP systems can be operated independently. The pressure sewer collection system is sized to allow all STEP systems to operate simultaneously if necessary. The control system was installed to study this new and innovative design concept. The collection system serving the community of Bidwell is a gravity sewer system. There is a pump station along Heatley Road, and another pump station along State Route 850, near the treatment lagoon.

No violations reported for the January 2012 through December 2016 review period. Bidwell Porter WWTP does not have NPDES permit limits for ammonia and phosphorus. The results for ammonia discharge from November 2015 to April 2016, averaged 15 mg/L. The phosphorus discharge results from November 2015 to April 2016 were 14.1 and 9.6 mg/l, respectively.

Rio Grande WWTP (Ohio EPA Permit # 0PB00035, outfall 001)

The Rio Grande WWTP is located at 178 State Route 325, Rio Grande, Gallia County. The WWTP serves the 998 residents of Rio Grande, University of Rio Grande/Rio Grande Community College and the 228 residents of the Village of Centerville. The original WWTP was built in 1937. In 1994 the last major modification to the WWTP was completed. The WWTP is designed to treatment 160,000 GPD of domestic sanitary wastewater and consists of primary treatment (bar screen, grit removal, muffin monster and pre-aeration), secondary treatment (two oxidation ditches, secondary clarifiers and scum removal) and chlorination/dechlorination with post-aeration. The WWTP discharges to Indian Creek at RM 1.45.

The WWTP have experienced sanitary sewer overflows due to power outages and heavy rain events. Bypassing treatment at the WWTP has resulted discharges of raw sewage to Indian Creek.

The WWTP has received over a million gallons a day during heavy rains and is operating at or near the design flow much of the year. There were numerous violations reported for January 2012 through December 2016 DMR review period. The WWTP had twelve ammonia, eleven D.O. and one TSS exceedance of the NPDES permit limits.

Gallia County Commissioners Rodney Village No 2 WWTP (Ohio EPA Permit # 0PG00054; outfall 001)

The Rodney Village No. 2 WWTP is located on State Route 588, Springfield Township, Gallia County. The WWTP was built in 1972 and received a major plant modification in 2004. The WWTP serves 50 residents within the small housing development. The WWTP is a 24,000 GPD extended aeration package plant with chlorination/dechlorination. The WWTP discharges to Ryan Run at RM 2.52. The WWTP reported five ammonia and six chlorine exceedances of the NPDES permit limits for the January 2012 through December 2016 DMR review period.

Elsea Incorporated dba Quail Creek Mobile Home Community (Ohio EPA Permit # 0PV00002; outfall 001)

The Quail Creek MHP WWTP is located at 437 Cora Mill Road, Rodney, Green Township, Gallia County. The WWTP serves approximately 100 mobile homes. The WWTP is a 22,000 GPD extended aeration package plant with chlorination/dechlorination. The WWTP discharges to an unnamed tributary to Mud Creek (enters at RM 4.3) at RM 0.65. Infiltration and inflow into the sewer system is a significant problem at Quail Creek. The WWTP has received as much as five times the design flow. Poor maintenance of the WWTP has led to numerous violations reported for the January 2012 through December 2016 DMR review period. NPDES permit violations range from not sampling as required by the NPDES permit to effluent limit exceedances. The WWTP had nine $CBOD_5$, three D.O., 38 ammonia, eight TSS and two bacteria violations.

The Rodney Village and Quail Creek MHP wastewater treatment plants are 0.63 miles apart. There are numerous homes and businesses in between these facilities and most home property lots are from 0.3 to 1 acre in size. A small home lot is not adequate to accommodate a properly functioning HSTS. The Rodney area is only 3.5 miles from the heavily urbanized Jackson Pike area as well.

Appendix C — Macroinvertebrate Collection Results

Station: 301747 RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328 0:00 8/17/16

Rivercode: 09-500-000 River Mile: 111.38

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
29	11	9	0	56	399	11	50	N/A	0.50 NORMAL

	Taxa	Quant/Qual
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	6+
11670	Procloeon viridoculare	+
13400	Stenacron sp	79+
13521	Stenonema femoratum	14+
14950	small Leptophlebiidae	27+
17200	Caenis sp	1
17600	Baetisca sp	+
21200	Calopteryx sp	8+
23909	Boyeria vinosa	+
24501	Gomphidae	1
26100	Cordulegaster sp	+
26700	Macromia sp	+
34100	Acroneuria sp	+
47600	Sialis sp	1+
48620	Nigronia serricornis	3+
50315	Chimarra obscura	1+
51400	Nyctiophylax sp	5
51600	Polycentropus group	1
52200	Cheumatopsyche sp	+
54100	Neotrichia sp	1
57900	Pycnopsyche sp	+
68130	Helichus sp	1+
69400	Stenelmis sp	1+
70900	Gonomyia sp	+
71100	Hexatoma sp	+
72340	Dixella sp	+
74501	Ceratopogonidae	1+
77120	Ablabesmyia mallochi	2
77750	Thienemannimyia sp	4
77800	Helopelopia sp	11
78140	Labrundinia pilosella	8
78450	Nilotanypus fimbriatus	4
78500	Zavrelimyia (Paramerina) fragilis	2
80358	Corynoneura macula	10
80370	Corynoneura lobata	18
80410	Cricotopus (C.) sp	2
81231	Nanocladius (N.) crassicornus or N. (N.) "rectinervis"	2
81825	Rheocricotopus (Psilocricotopus) robacki	2
82121	Thienemanniella lobapodema	4
83900	Nilothauma sp	7
84210	Paratendipes albimanus or P. duplicatus	2
84460	Polypedilum (P.) fallax group	9
84540	Polypedilum (Tripodura) scalaenum group	16
85500	Paratanytarsus sp	2
85800	Tanytarsus sp	67+
85801	Tanytarsus sp 1	9
85802	Tanytarsus n. sp. near curticornis	29
85821	Tanytarsus glabrescens group sp 7	33
86501	Stratiomyidae	+
87540	Hemerodromia sp	1
94400	Fossaria sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
96900	Ferrissia sp	4

Station: 301746 RACCOON CREEK DST. MITCHELL HOLLOW @ ST. RT. 328 0:00 8/23/16

Rivercode: 09-500-000 River Mile: 104.63

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
39	14	11	0	63	1,878	13	46	N/A	1.10 NORMAL

	Taxa	Quant/Qual
01900	Nemertea	3
03600	Oligochaeta	92
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	32
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
12200	Isonychia sp	1
13400	Stenacron sp	2+
17200	Caenis sp	152+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26700	Macromia sp	+
43300	Ranatra sp	+
47600	Sialis sp	1+
50315	Chimarra obscura	147+
51400	Nyctiophylax sp	1+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	41+
52530	Hydropsyche depravata group	2+
53800	Hydroptila sp	1
55300	Ptilostomis sp	+
57900	Pycnopsyche sp	+
59580	Oecetis persimilis	2+
59700	Triaenodes sp	+
60400	Gyrinus sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	1+
68708	Dubiraphia vittata group	9+
68901	Macronychus glabratus	14+
69400	Stenelmis sp	1
71100	Hexatoma sp	+
71700	Pilaria sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	137
77115	Ablabesmyia janta	13
77120	Ablabesmyia mallochi	13+
77500	Conchapelopia sp	107+
77750	Thienemannimyia sp	67
78450	Nilotanypus fimbriatus	4
79085	Telopelopia okoboji	13
80370	Corynoneura lobata	8
80410	Cricotopus (C.) sp	13
80420	Cricotopus (C.) bicinctus	13
83040	Dicrotendipes neomodestus	26
84410	Polypedilum (Pentapedilum) tritum	13
84651	Kribiodorum perpulchrum	13
84960	Pseudochironomus sp	13
85625	Rheotanytarsus sp	13
85800	Tanytarsus sp	520+
85801	Tanytarsus sp 1	200
85802	Tanytarsus n. sp. near curticornis	67
85821	Tanytarsus glabrescens group sp 7	13
86100	Chrysops sp	1+
87540	Hemerodromia sp	8
95100	Physella sp	+
96002	Helisoma anceps anceps	+
96900	Ferrissia sp	22
97601	Corbicula fluminea	79+

Station: W03W32 RACCOON CREEK W OF ZALESKI @ ST. RT. 677 0:00 8/22/16

Rivercode: 09-500-000 River Mile: 99.60

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
53	22	16	0	68	5,514	16	40	N/A	1.20 NORMAL

	Taxa	Quant/Qual
01900	Nemertea	16
03360	Plumatella sp	+
03600	Oligochaeta	185
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	16
11150	Labiobaetis propinquus	+
11200	Callibaetis sp	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11650	Procloeon sp (w/ hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	40+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
26600	Didymops transversa	+
28001	Libellulidae	+
34100	Acroneuria sp	+
42700	Belostoma sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	185+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	160+
52530	Hydropsyche depravata group	1+
53800	Hydroptila sp	+
57900	Pycnopsyche sp	+
59580	Oecetis persimilis	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
60300	Dineutus sp	+
68130	Helichus sp	1+
68601	Ancyronyx variegatus	1+
68901	Macronychus glabratus	40+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71900	Tipula sp	16+
72900	Culex sp	+
74100	Simulium sp	8+
74501	Ceratopogonidae	97+
77140	Ablabesmyia peleensis	+
77500	Conchapelopia sp	191
77800	Helopelopia sp	+
80370	Corynoneura lobata	8
81825	Rheocricotopus (Psilocricotopus) robacki	334
82121	Thienemanniella lobapodema	8
83900	Nilothauma sp	48
84060	Parachironomus pectinatellae	+
84460	Polypedilum (P.) fallax group	48
84470	Polypedilum (P.) illinoense	48+
85500	Paratanytarsus sp	+
85625	Rheotanytarsus sp	382
85800	Tanytarsus sp	2,912+
85801	Tanytarsus sp 1	286
85802	Tanytarsus n. sp. near curticornis	143
85821	Tanytarsus glabrescens group sp 7	48
87540	Hemerodromia sp	284
95100	Physella sp	+
98001	Sphaeriidae	8

Station: W03W44 RACCOON CREEKSW OF ZALESKI @ FOREST ROAD #3 0:00 8/23/16

Rivercode: 09-500-000 River Mile: 98.34

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
34	15	10	0	56	2,858	12	42	N/A	0.20 NORMAL

	Taxa	Quant/Qual
01900	Nemertea	8
03360	Plumatella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	17+
13400	Stenacron sp	63+
13510	Maccaffertium exiguum	2
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	2
14950	small Leptophlebiidae	8
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	2+
22300	Argia sp	2
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25010	Hagenius brevistylus	+
26700	Macromia sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	53+
51300	Neureclipsis sp	1+
52200	Cheumatopsyche sp	63+
52530	Hydropsyche depravata group	+
54300	Oxyethira sp	+
57900	Pycnopsyche sp	+
59310	Mystacides sepulchralis	+
59500	Oecetis sp	9
60300	Dineutus sp	1+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	2+
69400	Stenelmis sp	+
74100	Simulium sp	17+
74501	Ceratopogonidae	33
77500	Conchapelopia sp	120
80358	Corynoneura macula	24
80370	Corynoneura lobata	48
81825	Rheocricotopus (Psilocricotopus) robacki	192
82121	Thienemanniella lobapodema	64
84460	Polypedilum (P.) fallax group	24
84540	Polypedilum (Tripodura) scalaenum group	48
84651	Kribiodorum perpulchrum	24
84790	Tribelos fuscicorne	24
85625	Rheotanytarsus sp	120
85800	Tanytarsus sp	1,200
85801	Tanytarsus sp 1	192+
85802	Tanytarsus n. sp. near curticornis	216
85821	Tanytarsus glabrescens group sp 7	216
86100	Chrysops sp	+
87540	Hemerodromia sp	19
96002	Helisoma anceps anceps	+
96900	Ferrissia sp	1
97601	Corbicula fluminea	43+

Station: W03W33 RACCOON CREEK DST. SANDY RUN (LAKE HOPE) @ CO. RD. 3 0:00 8/16/16

Rivercode: 09-500-000 River Mile: 92.30

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
35	15	8	0	35		8		Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04685	Placobdella ornata	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11130	Baetis intercalaris	+
11150	Labiobaetis propinquus	+
11200	Callibaetis sp	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
13400	Stenacron sp	+
13590	Maccaffertium vicarium	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
26600	Didymops transversa	+
47600	Sialis sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
54300	Oxyethira sp	+
57900	Pycnopsyche sp	+
59300	Mystacides sp	+
59700	Triaenodes sp	+
60300	Dineutus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
69400	Stenelmis sp	+
71910	Tipula abdominalis	+
72700	Anopheles sp	+
77500	Conchapelopia sp	+
84460	Polypedilum (P.) fallax group	+
84470	Polypedilum (P.) illinoense	+
85800	Tanytarsus sp	+
97601	Corbicula fluminea	+

Station: 302520 RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD. 0:00 8/15/16

Rivercode: 09-500-000 River Mile: 89.98

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow	
46	18	15	0	68	488	16	28	Good	0.20	NORMAL

	Taxa	Quant/Qual
01320	Hydra sp	1
01900	Nemertea	1
03600	Oligochaeta	62+
06201	Hyalella sp	+
08200	Orconectes sp	+
11130	Baetis intercalaris	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
12200	Isonychia sp	+
13400	Stenacron sp	15+
13590	Maccaffertium vicarium	3+
14950	small Leptophlebiidae	1
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	3+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
25010	Hagenius brevistylus	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
45400	Trichocorixa sp	+
48410	Corydalus cornutus	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	+
51300	Neureclipsis sp	+
52530	Hydropsyche depravata group	+
52570	Hydropsyche simulans	+
53800	Hydroptila sp	4
57900	Pycnopsyche sp	+
59310	Mystacides sepulchralis	+
59500	Oecetis sp	2+
59720	Triaenodes ignitus	+
59724	Triaenodes injustus	+
60400	Gyrinus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	4+
69400	Stenelmis sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	10+
77120	Ablabesmyia mallochi	5
77500	Conchapelopia sp	61
78101	Labrundinia becki	5
78140	Labrundinia pilosella	5
78655	Procladius (Holotanypus) sp	+
80358	Corynoneura macula	11
82101	Thienemanniella taurocapita	2
82121	Thienemanniella lobapodema	1
82800	Cladopelma sp	+
82820	Cryptochironomus sp	9+
82885	Cryptotendipes pseudotener	+
84460	Polypedilum (P.) fallax group	23
84470	Polypedilum (P.) illinoense	66+
84540	Polypedilum (Tripodura) scalaenum group	5
84790	Tribelos fuscicorne	14
85625	Rheotanytarsus sp	5
85800	Tanytarsus sp	103
85801	Tanytarsus sp 1	23
85815	Tanytarsus glabrescens group sp 1	5
85821	Tanytarsus glabrescens group sp 7	7
87540	Hemerodromia sp	12
94603	Pseudosuccinea columella	+
95100	Physella sp	2
96002	Helisoma anceps anceps	8+
96900	Ferrissia sp	8
97601	Corbicula fluminea	2+

Station: 302519 RACCOON CREEK DST. HEWETT FORK @ CO. RD. 18 B 0:00 8/16/16

Rivercode: 09-500-000 River Mile: 89.36

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
33	12	9	0	33		9		Marginally Good	NORMAL

	Taxa	Quant/Qual
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
12200	Isonychia sp	+
13400	Stenacron sp	+
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26501	Macromiidae	+
27500	Somatochlora sp	+
47600	Sialis sp	+
51300	Neureclipsis sp	+
51400	Nyctiophylax sp	+
51500	Phylocentropus sp	+
57900	Pycnopsyche sp	+
59500	Oecetis sp	+
59724	Triaenodes injustus	+
60300	Dineutus sp	+
67500	Laccobius sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
84470	Polypedilum (P.) illinoense	+
86100	Chrysops sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	+

Station: W03W34 RACCOON CREEK NEAR KNOX, UPST ONION CREEK @ ST. RT. 356 0:00 8/23/16

Rivercode: 09-500-000 River Mile: 84.08

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow	
43	15	13	0	62	3,533	18	38	N/A	0.80	NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
01900	Nemertea	2
03600	Oligochaeta	144+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11018	Acerpenna macdunnoughi	3
11130	Baetis intercalaris	8
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	72+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	20
13590	Maccaffertium vicarium	84+
14950	small Leptophlebiidae	+
16700	Tricorythodes sp	16
17600	Baetisca sp	+
21200	Calopteryx sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24700	Dromogomphus sp	+
26600	Didymops transversa	+
26700	Macromia sp	+
47600	Sialis sp	+
49101	Sisyridae	+
50315	Chimarra obscura	57+
51300	Neureclipsis sp	1+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	140+
52570	Hydropsyche simulans	4
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
59730	Triaenodes melaca	+
60300	Dineutus sp	2+
60900	Peltodytes sp	+
68130	Helichus sp	1+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	53+
69400	Stenelmis sp	1
72700	Anopheles sp	+
74100	Simulium sp	9+
74501	Ceratopogonidae	8+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	243+
78655	Procladius (Holotanypus) sp	+
79085	Telopelopia okoboji	22
80370	Corynoneura lobata	16
81825	Rheocricotopus (Psilocricotopus) robacki	309
84450	Polypedilum (Uresipedilum) flavum	486
84460	Polypedilum (P.) fallax group	44
84540	Polypedilum (Tripodura) scalaenum group	22
84700	Stenochironomus sp	+
84790	Tribelos fuscicorne	22
85625	Rheotanytarsus sp	1,192
85800	Tanytarsus sp	309
85801	Tanytarsus sp 1	44+
85821	Tanytarsus glabrescens group sp 7	157
87540	Hemerodromia sp	41
95100	Physella sp	+
96002	Helisoma anceps anceps	+
96900	Ferrissia sp	1
97601	Corbicula fluminea	+

Station: W03G50 RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50 0:00 8/25/16

Rivercode: 09-500-000 River Mile: 80.62

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
50	16	16	0	66	3,448	18	40	N/A	1.25 NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
01900	Nemertea	1
03600	Oligochaeta	27+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	52+
11018	Acerpenna macdunnoughi	+
11130	Baetis intercalaris	2+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
12200	Isonychia sp	7+
13400	Stenacron sp	12+
13590	Maccaffertium vicarium	18+
16700	Tricorythodes sp	6
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25600	Stylurus sp	+
26100	Cordulegaster sp	+
26700	Macromia sp	+
34130	Acroneuria frisoni	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
49101	Sisyridae	+
50315	Chimarra obscura	122+
51300	Neureclipsis sp	+
52200	Cheumatopsyche sp	28+
52570	Hydropsyche simulans	3
53800	Hydroptila sp	11
54100	Neotrichia sp	1
57900	Pycnopsyche sp	+
59310	Mystacides sepulchralis	+
59580	Oecetis persimilis	4+
59720	Triaenodes ignitus	+
60300	Dineutus sp	+
63300	Hydroporini	+
68130	Helichus sp	2+
68601	Ancyronyx variegatus	4
68708	Dubiraphia vittata group	2+
68901	Macronychus glabratus	46+
69400	Stenelmis sp	4
74100	Simulium sp	+
74501	Ceratopogonidae	33+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	170
78450	Nilotanypus fimbriatus	28
78655	Procladius (Holotanypus) sp	+
80370	Corynoneura lobata	16
80410	Cricotopus (C.) sp	57
80420	Cricotopus (C.) bicinctus	57
81825	Rheocricotopus (Psilocricotopus) robacki	368
84450	Polypedilum (Uresipedilum) flavum	566+
84470	Polypedilum (P.) illinoense	+
84888	Xenochironomus xenolabis	+
85263	Cladotanytarsus vanderwulpi group sp 3	+
85625	Rheotanytarsus sp	1,443
85800	Tanytarsus sp	198+
85821	Tanytarsus glabrescens group sp 7	113
87540	Hemerodromia sp	25+
95100	Physella sp	+
96002	Helisoma anceps anceps	1+
96900	Ferrissia sp	20
97601	Corbicula fluminea	1+

Station: W03P07 RACCOON CREEK AT VALES MILLS @ ST. RT. 346 0:00 8/25/16

Rivercode: 09-500-000 River Mile: 72.22

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
52	20	17	0	59	3,693	18	38	N/A	1.50 NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	16
11130	Baetis intercalaris	250+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	123+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	211+
13590	Maccaffertium vicarium	160+
16700	Tricorythodes sp	+
17200	Caenis sp	+
17600	Baetisca sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
25600	Stylurus sp	+
26700	Macromia sp	+
27340	Helocordulia uhleri	+
47600	Sialis sp	+
48410	Corydalus cornutus	6
48620	Nigronia serricornis	+
50315	Chimarra obscura	334+
51300	Neureclipsis sp	+
51500	Phylocentropus sp	+
52200	Cheumatopsyche sp	285+
52530	Hydropsyche depravata group	16
52570	Hydropsyche simulans	147+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
60300	Dineutus sp	1+
60900	Peltodytes sp	+
67100	Hydrobius sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	115+
69400	Stenelmis sp	+
71900	Tipula sp	+
74100	Simulium sp	67+
77120	Ablabesmyia mallochi	+
78655	Procladius (Holotanypus) sp	+
80370	Corynoneura lobata	8
80410	Cricotopus (C.) sp	16+
81825	Rheocricotopus (Psilocricotopus) robacki	143
83840	Microtendipes pedellus group	+
84450	Polypedilum (Uresipedilum) flavum	920+
85625	Rheotanytarsus sp	841+
85800	Tanytarsus sp	16
87540	Hemerodromia sp	18
95100	Physella sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	+
98600	Sphaerium sp	+

Station: W03W35 RACCOON CREEK 0.3 MI. UPST. ZINNS RUN @ CO. RD. 28 0:00 8/29/16

Rivercode: 09-500-000 River Mile: 63.80

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
41	20	20	0	56	1,626	20	40	N/A	1.20 NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
03600	Oligochaeta	8
11130	Baetis intercalaris	102+
11150	Labiobaetis propinquus	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	10+
13400	Stenacron sp	4+
13510	Maccaffertium exiguum	164+
13590	Maccaffertium vicarium	19+
16700	Tricorythodes sp	42+
17600	Baetisca sp	+
21200	Calopteryx sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25600	Stylurus sp	+
26700	Macromia sp	+
48410	Corydalus cornutus	2+
48620	Nigronia serricornis	+
49200	Climacia areolaris	+
50315	Chimarra obscura	7+
51300	Neureclipsis sp	+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	26+
52570	Hydropsyche simulans	2+
53800	Hydroptila sp	9
55520	Brachycentrus numerosus	+
57900	Pycnopsyche sp	+
59300	Mystacides sp	+
59500	Oecetis sp	1+
59720	Triaenodes ignitus	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68901	Macronychus glabratus	138+
71900	Tipula sp	+
74100	Simulium sp	19+
77130	Ablabesmyia rhamphe group	+
77500	Conchapelopia sp	92
80204	Brillia flavifrons group	11
80370	Corynoneura lobata	8
80410	Cricotopus (C.) sp	92
80420	Cricotopus (C.) bicinctus	34
81825	Rheocricotopus (Psilocricotopus) robacki	69
83040	Dicrotendipes neomodestus	11
83900	Nilothauma sp	12
84450	Polypedilum (Uresipedilum) flavum	310
84460	Polypedilum (P.) fallax group	23
84790	Tribelos fuscicorne	+
85625	Rheotanytarsus sp	287+
85704	Stempellina poss. subglabripennis	+
85800	Tanytarsus sp	23
85821	Tanytarsus glabrescens group sp 7	80
87540	Hemerodromia sp	10+
96002	Helisoma anceps anceps	+
96900	Ferrissia sp	11
97601	Corbicula fluminea	+

Station: W03P18 RACCOON CREEK S OF CLARION @ ST. RT. 124 0:00 8/30/16

Rivercode: 09-500-000 River Mile: 55.48

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
42	17	16	0	55	1,136	18	40	N/A	0.80 NORMAL

	Taxa	Quant/Qual
01900	Nemertea	1
03600	Oligochaeta	4+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	37
11130	Baetis intercalaris	89+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	1+
11650	Procloeon sp (w/ hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	10+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	12
13590	Maccaffertium vicarium	80
16700	Tricorythodes sp	178+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24501	Gomphidae	+
26700	Macromia sp	+
47600	Sialis sp	+
48410	Corydalus cornutus	4+
50315	Chimarra obscura	6+
51300	Neureclipsis sp	3+
51400	Nyctiophylax sp	1+
52200	Cheumatopsyche sp	81+
52570	Hydropsyche simulans	15+
53800	Hydroptila sp	9
57900	Pycnopsyche sp	+
59580	Oecetis persimilis	1+
59720	Triaenodes ignitus	+
60300	Dineutus sp	+
68130	Helichus sp	1+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	75+
69400	Stenelmis sp	4
74100	Simulium sp	4+
74501	Ceratopogonidae	+
77500	Conchapelopia sp	74
80370	Corynoneura lobata	4
81825	Rheocricotopus (Psilocricotopus) robacki	160
82885	Cryptotendipes pseudotener	+
84450	Polypedilum (Uresipedilum) flavum	178+
84470	Polypedilum (P.) illinoense	+
84700	Stenochironomus sp	+
85625	Rheotanytarsus sp	6
85800	Tanytarsus sp	37
85821	Tanytarsus glabrescens group sp 7	25
86100	Chrysops sp	+
87540	Hemerodromia sp	13
96002	Helisoma anceps anceps	1+
96900	Ferrissia sp	22+
97601	Corbicula fluminea	+
98200	Pisidium sp	+

Station: W03S34 RACCOON CREEK 3 MI. SW OF WILKESVILLE @ CO. RD. 5-W 0:00 9/1/16

Rivercode: 09-500-000 River Mile: 50.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
42	19	19	0	51	1,880	19	40	N/A	1.00 NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	8+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	33
11130	Baetis intercalaris	469+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	3+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	160+
13590	Maccaffertium vicarium	48+
16700	Tricorythodes sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24700	Dromogomphus sp	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
47600	Sialis sp	+
48410	Corydalus cornutus	7+
50315	Chimarra obscura	10+
51300	Neureclipsis sp	+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	125+
52570	Hydropsyche simulans	+
53800	Hydroptila sp	4
55520	Brachycentrus numerosus	+
57900	Pycnopsyche sp	+
59500	Oecetis sp	1
59700	Triaenodes sp	+
60300	Dineutus sp	1+
63300	Hydroporini	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	29
68700	Dubiraphia sp	+
68901	Macronychus glabratus	110+
74100	Simulium sp	79+
77500	Conchapelopia sp	10+
80370	Corynoneura lobata	8
81825	Rheocricotopus (Psilocricotopus) robacki	10
82300	Xylotopus par	+
84450	Polypedilum (Uresipedilum) flavum	235
85625	Rheotanytarsus sp	525
87540	Hemerodromia sp	5
95100	Physella sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	+

Station: W03P05 RACCOON CREEK AT VINTON @ ST. RT. 160 0:00 9/7/16

Rivercode: 09-500-000 River Mile: 40.01

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
57	19	20	0	74	5,498	23	42	N/A	0.70 NORMAL

	Taxa	Quant/Qual
01900	Nemertea	1
03360	Plumatella sp	4+
03600	Oligochaeta	192+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	16+
11018	Acerpenna macdunnoughi	1
11130	Baetis intercalaris	41+
11150	Labiobaetis propinquus	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	55+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	203+
13590	Maccaffertium vicarium	81+
16700	Tricorythodes sp	295+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
25600	Stylurus sp	+
26100	Cordulegaster sp	+
26700	Macromia sp	+
43570	Neoplea sp	+
44501	Corixidae	+
47600	Sialis sp	+
48410	Corydalus cornutus	+
50315	Chimarra obscura	90+
51300	Neureclipsis sp	1+
52200	Cheumatopsyche sp	737+
52570	Hydropsyche simulans	43+
53800	Hydroptila sp	72+
55520	Brachycentrus numerosus	1
57900	Pycnopsyche sp	+
59580	Oecetis persimilis	37+
59724	Triaenodes injustus	+
60300	Dineutus sp	1+
60900	Peltodytes sp	+
68130	Helichus sp	1+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	282+
71100	Hexatoma sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	206
77750	Thienemannimyia sp	69
78140	Labrundinia pilosella	34
78450	Nilotanypus fimbriatus	34
80370	Corynoneura lobata	16
80420	Cricotopus (C.) bicinctus	206+
81825	Rheocricotopus (Psilocricotopus) robacki	172
82820	Cryptochironomus sp	34
83040	Dicrotendipes neomodestus	69+
84060	Parachironomus pectinatellae	34
84450	Polypedilum (Uresipedilum) flavum	823+
84460	Polypedilum (P.) fallax group	34
84470	Polypedilum (P.) illinoense	34+
84540	Polypedilum (Tripodura) scalaenum group	69
84700	Stenochironomus sp	34
84960	Pseudochironomus sp	34
85625	Rheotanytarsus sp	823
85800	Tanytarsus sp	69+
85821	Tanytarsus glabrescens group sp 7	549+
87540	Hemerodromia sp	1
94603	Pseudosuccinea columella	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	+
99860	Lampsilis siliquoidea	+

Station: W03S44 RACCOON CREEK AT WOODS MILL @ EAGLE RD. 0:00 9/8/16

Rivercode: 09-500-000 River Mile: 35.61

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
43	22	18	1	56	4,934	19	48	N/A	0.80 NORMAL

	Taxa	Quant/Qual
01320	Hydra sp	1
01900	Nemertea	16
03360	Plumatella sp	1
03600	Oligochaeta	40+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	32+
11130	Baetis intercalaris	344+
11150	Labiobaetis propinquus	+
11620	Paracloeodes minutus	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	454+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	1,267+
16700	Tricorythodes sp	4+
17600	Baetisca sp	+
22001	Coenagrionidae	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
47600	Sialis sp	+
48410	Corydalus cornutus	4+
50315	Chimarra obscura	235+
51300	Neureclipsis sp	19+
52200	Cheumatopsyche sp	1,343+
52530	Hydropsyche depravata group	2+
52570	Hydropsyche simulans	130+
53800	Hydroptila sp	16+
54100	Neotrichia sp	+
55520	Brachycentrus numerosus	+
57900	Pycnopsyche sp	+
59300	Mystacides sp	+
59415	Nectopsyche exquisita	+
59580	Oecetis persimilis	16+
59720	Triaenodes ignitus	+
60300	Dineutus sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	1+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	73+
69400	Stenelmis sp	4
74100	Simulium sp	19
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	24
80420	Cricotopus (C.) bicinctus	16
81825	Rheocricotopus (Psilocricotopus) robacki	47
82885	Cryptotendipes pseudotener	+
84450	Polypedilum (Uresipedilum) flavum	150
84700	Stenochironomus sp	24
85201	Cladotanytarsus species group A	8
85625	Rheotanytarsus sp	624
85821	Tanytarsus glabrescens group sp 7	+
87510	Neoplasta sp	4
87540	Hemerodromia sp	16+
96900	Ferrissia sp	+
97601	Corbicula fluminea	+

Station: 601400 RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35 0:00 9/8/16

Rivercode: 09-500-000 River Mile: 29.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
47	23	23	0	47		23		Exceptional	NORMAL

	Taxa	Quant/Qual
00401	Spongillidae	+
03360	Plumatella sp	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11123	Labiobaetis dardanus	+
11130	Baetis intercalaris	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11650	Procloeon sp (w/ hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	+
13570	Maccaffertium terminatum	+
16700	Tricorythodes sp	+
17600	Baetisca sp	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26700	Macromia sp	+
27400	Neurocordulia sp	+
47600	Sialis sp	+
48410	Corydalus cornutus	+
50315	Chimarra obscura	+
51300	Neureclipsis sp	+
52200	Cheumatopsyche sp	+
52570	Hydropsyche simulans	+
53800	Hydroptila sp	+
55520	Brachycentrus numerosus	+
57900	Pycnopsyche sp	+
59110	Ceraclea ancylus	+
59120	Ceraclea flava or C. neffi	+
59580	Oecetis persimilis	+
59724	Triaenodes injustus	+
60300	Dineutus sp	+
63900	Laccophilus sp	+
67300	Hydrochus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
72700	Anopheles sp	+
82880	Cryptotendipes sp	+
84450	Polypedilum (Uresipedilum) flavum	+
97601	Corbicula fluminea	+
98200	Pisidium sp	+
99860	Lampsilis siliquoidea	+
99880	Lampsilis cardium	+

Station: 303503 RACCOON CREEK ADJ. DAN JONES RD 0:00 9/26/16

Rivercode: 09-500-000 River Mile: 22.00

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
57	24	21	0	57		21		Exceptional	NORMAL

Taxa	Quant/Qual
00401 Spongillidae	+
01801 Turbellaria	+
03600 Oligochaeta	+
11130 Baetis intercalaris	+
11150 Labiobaetis propinquus	+
11250 Neocloeon sp	+
11670 Procloeon viridoculare	+
12200 Isonychia sp	+
13400 Stenacron sp	+
13510 Maccaffertium exiguum	+
13521 Stenonema femoratum	+
13570 Maccaffertium terminatum	+
16700 Tricorythodes sp	+
17200 Caenis sp	+
17600 Baetisca sp	+
22001 Coenagrionidae	+
22300 Argia sp	+
23909 Boyeria vinosa	+
24610 Arigomphus furcifer	+
24900 Gomphus Complex	+
26700 Macromia sp	+
28500 Libellula sp	+
42700 Belostoma sp	+
44501 Corixidae	+
47600 Sialis sp	+
48410 Corydalus cornutus	+
50315 Chimarra obscura	+
51206 Cyrnellus fraternus	+
51300 Neureclipsis sp	+
51600 Polycentropus group	+
52200 Cheumatopsyche sp	+
52570 Hydropsyche simulans	+
55520 Brachycentrus numerosus	+
59120 Ceraclea flava or C. neffi	+
59407 Nectopsyche candida	+
59580 Oecetis persimilis	+
59720 Triaenodes ignitus	+
59724 Triaenodes injustus	+
60300 Dineutus sp	+
60900 Peltodytes sp	+
67750 Sperchopsis tesselatus	+
68130 Helichus sp	+
68901 Macronychus glabratus	+
69400 Stenelmis sp	+
71910 Tipula abdominalis	+
72700 Anopheles sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
81825 Rheocricotopus (Psilocricotopus) robacki	+
82730 Chironomus (C.) decorus group	+
82822 Cryptochironomus eminentia	+
82880 Cryptotendipes sp	+
84118 Paracladopelma undine	+
84470 Polypedilum (P.) illinoense	+
85800 Tanytarsus sp	+
95100 Physella sp	+
97601 Corbicula fluminea	+

Station: W03S24 RACCOON CREEK AT NORTHUP, DST. DAM 0:00 8/31/16

Rivercode: 09-500-000 River Mile: 10.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
76	29	27	0	87	4,510	28	52	N/A	NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
01801	Turbellaria	1+
03121	Paludicella articulata	1+
03360	Plumatella sp	+
03451	Urnatella gracilis	+
03600	Oligochaeta	8+
06810	Gammarus fasciatus	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	8+
11118	Plauditus dubius	4
11125	Labiobaetis frondalis	+
11130	Baetis intercalaris	154+
11150	Labiobaetis propinquus	+
11200	Callibaetis sp	+
11620	Paracloeodes minutus	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	114+
13100	Nixe sp	+
13400	Stenacron sp	19
13510	Maccaffertium exiguum	1,442+
13521	Stenonema femoratum	+
13570	Maccaffertium terminatum	+
16700	Tricorythodes sp	141+
17100	Sparbarus sp	+
17600	Baetisca sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24700	Dromogomphus sp	+
24900	Gomphus Complex	+
25010	Hagenius brevistylus	+
25410	Progomphus obscurus	+
25620	Stylurus spiniceps	+
26700	Macromia sp	+
27400	Neurocordulia sp	+
28500	Libellula sp	+
47600	Sialis sp	+
48410	Corydalus cornutus	23+
50315	Chimarra obscura	142+
51300	Neureclipsis sp	44+
52200	Cheumatopsyche sp	1,489+
52530	Hydropsyche depravata group	+
52570	Hydropsyche simulans	232+
53800	Hydroptila sp	21+
54100	Neotrichia sp	1+
55520	Brachycentrus numerosus	+
59407	Nectopsyche candida	+
59415	Nectopsyche exquisita	+
59580	Oecetis persimilis	40+
59720	Triaenodes ignitus	+
59724	Triaenodes injustus	+
60300	Dineutus sp	1+
65800	Berosus sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	109+
69400	Stenelmis sp	43+
72700	Anopheles sp	+
74100	Simulium sp	26
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	7
77750	Thienemannimyia sp	38+
78450	Nilotanypus fimbriatus	21
78655	Procladius (Holotanypus) sp	+
80420	Cricotopus (C.) bicinctus	31
81825	Rheocricotopus (Psilocricotopus) robacki	28
82730	Chironomus (C.) decorus group	+
82820	Cryptochironomus sp	+
82885	Cryptotendipes pseudotener	+
83002	Dicrotendipes modestus	+
83040	Dicrotendipes neomodestus	4+
84450	Polypedilum (Uresipedilum) flavum	98+
84470	Polypedilum (P.) illinoense	+
84540	Polypedilum (Tripodura) scalaenum group	7
84750	Stictochironomus sp	+
85201	Cladotanytarsus species group A	+
85625	Rheotanytarsus sp	150+
85800	Tanytarsus sp	11
85821	Tanytarsus glabrescens group sp 7	31
86100	Chrysops sp	+
87540	Hemerodromia sp	18
93200	Hydrobiidae	+
97601	Corbicula fluminea	3+
98600	Sphaerium sp	+

Station: 203928 TRIB. TO RACCOON CREEK (98.96) SW OF ZALESKI @ MOUTH 0:00 8/24/16

Rivercode: 09-500-011 River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
30	2	0	0	30		0		Poor	NORMAL

	Taxa	Quant/Qual
06201	Hyalella sp	+
17200	Caenis sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
28001	Libellulidae	+
28955	Plathemis lydia	+
42700	Belostoma sp	+
45400	Trichocorixa sp	+
45900	Notonecta sp	+
47600	Sialis sp	+
52200	Cheumatopsyche sp	+
60300	Dineutus sp	+
60900	Peltodytes sp	+
61100	Acilius sp	+
63300	Hydroporini	+
63700	Ilybius sp	+
67800	Tropisternus sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
77355	Clinotanypus pinguis	+
79030	Tanypus punctipennis (sensu Roback, 1977)	+
83002	Dicrotendipes modestus	+
83158	Endochironomus nigricans	+
83590	Kiefferulus sp	+
84460	Polypedilum (P.) fallax group	+
85800	Tanytarsus sp	+
86100	Chrysops sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
96264	Planorbella (Pierosoma) pilsbryi	+

Station: 303508 BIG BEAVER CREEK AT GUTHRE RD. S. OF RIO GRANDE 0:00 7/20/16

Rivercode: 09-500-012 River Mile: 0.90

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
40	12	10	0	40		10		Good	NORMAL

	Taxa	Quant/Qual
03360	Plumatella sp	+
03600	Oligochaeta	+
04686	Placobdella papillifera	+
06201	Hyalella sp	+
08200	Orconectes sp	+
08601	Hydrachnidia	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
27500	Somatochlora sp	+
47600	Sialis sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
57900	Pycnopsyche sp	+
59730	Triaenodes melaca	+
63300	Hydroporini	+
67500	Laccobius sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
71100	Hexatoma sp	+
71900	Tipula sp	+
72340	Dixella sp	+
77500	Conchapelopia sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
78655	Procladius (Holotanypus) sp	+
83670	Lipiniella sp	+
84800	Tribelos jucundum	+
86100	Chrysops sp	+
95100	Physella sp	+
96900	Ferrissia sp	+
98600	Sphaerium sp	+

Station: W03K21 BULLSKIN CREEK AT THIVENOR @ ST. RT. 218 0:00 7/27/16

Rivercode: 09-502-000 River Mile: 0.37

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	15	10	0	31		10		Good	NORMAL

	Taxa	Quant/Qual
01801	Turbellaria	+
02600	Nematomorpha	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11130	Baetis intercalaris	+
11150	Labiobaetis propinquus	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	+
50804	Lype diversa	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
77800	Helopelopia sp	+
95100	Physella sp	+

Station: W03K22 L. BULLSKIN CREEK SW OF THIVENOR @ MOUTH 0:00 7/27/16

Rivercode: 09-503-000 River Mile: 0.01

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
29	10	7	1	29		7		Marginally Good	NORMAL

	Taxa	Quant/Qual
03360	Plumatella sp	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11130	Baetis intercalaris	+
11651	Procloeon sp (w/o hindwing pads)	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21200	Calopteryx sp	+
23804	Basiaeschna janata	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	+
57900	Pycnopsyche sp	+
59730	Triaenodes melaca	+
68201	Scirtidae	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71800	Pseudolimnophila sp	+
71900	Tipula sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
79400	Zavrelimyia (Z.) sp	+
85625	Rheotanytarsus sp	+
95100	Physella sp	+

Station: W03K23 CLEAR FORK NEAR NORTHUP @ INGALLS RD. 0:00 7/20/16

Rivercode: 09-506-000 River Mile: 0.02

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
29	9	4	0	29		4		Fair	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
52200	Cheumatopsyche sp	+
53800	Hydroptila sp	+
59720	Triaenodes ignitus	+
65800	Berosus sp	+
67800	Tropisternus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
72700	Anopheles sp	+
74650	Atrichopogon sp	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
82730	Chironomus (C.) decorus group	+
83040	Dicrotendipes neomodestus	+
84470	Polypedilum (P.) illinoense	+
84750	Stictochironomus sp	+
85821	Tanytarsus glabrescens group sp 7	+
95100	Physella sp	+

Station: 203929 CLAYLICK RUN SW OF NORTHUP @ LINCLON PIKE 0:00 7/27/16

Rivercode: 09-507-000 River Mile: 0.40

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	12	8	0	31		8		Good	NORMAL

	Taxa	Quant/Qual
03360	Plumatella sp	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11120	Baetis flavistriga	+
11130	Baetis intercalaris	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21001	Calopterygidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
25510	Stylogomphus albistylus	+
26600	Didymops transversa	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
67500	Laccobius sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
77120	Ablabesmyia mallochi	+
84540	Polypedilum (Tripodura) scalaenum group	+
84750	Stictochironomus sp	+
85800	Tanytarsus sp	+
94400	Fossaria sp	+
95100	Physella sp	+

Station: W03S09 L. RACCOON CREEK UPST LAKE RUPERT @ CO. RD. 25 0:00 7/13/16

Rivercode: 09-510-000 River Mile: 36.67

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
35	8	4	0	35		4		Fair	NORMAL

	Taxa	Quant/Qual
01801	Turbellaria	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11250	Neocloeon sp	+
13400	Stenacron sp	+
17200	Caenis sp	+
18750	Hexagenia limbata	+
23600	Aeshna sp	+
24900	Gomphus Complex	+
26705	Macromia illinoiensis	+
28955	Plathemis lydia	+
44501	Corixidae	+
47600	Sialis sp	+
51400	Nyctiophylax sp	+
51500	Phylocentropus sp	+
51600	Polycentropus group	+
59400	Nectopsyche sp	+
60300	Dineutus sp	+
67500	Laccobius sp	+
68708	Dubiraphia vittata group	+
71700	Pilaria sp	+
71900	Tipula sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
77355	Clinotanypus pinguis	+
78401	Natarsia species A (sensu Roback, 1978)	+
78655	Procladius (Holotanypus) sp	+
82730	Chironomus (C.) decorus group	+
82820	Cryptochironomus sp	+
84210	Paratendipes albimanus or P. duplicatus	+
84800	Tribelos jucundum	+
85800	Tanytarsus sp	+
95100	Physella sp	+
98600	Sphaerium sp	+

Station: W03S07 L. RACCOON CREEK UPST. MEADOW RUN @ CO. RD. 39 0:00 8/31/16

Rivercode: 09-510-000 River Mile: 27.90

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
33	9	6	0	55	1,406	8	40	N/A	0.20 NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
01320	Hydra sp	4
01801	Turbellaria	46
01900	Nemertea	+
03360	Plumatella sp	1+
03600	Oligochaeta	63+
06201	Hyalella sp	14+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	4
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	3
11670	Procloeon viridoculare	+
13400	Stenacron sp	312+
13510	Maccaffertium exiguum	3+
14950	small Leptophlebiidae	8
17200	Caenis sp	1+
22300	Argia sp	5+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
43570	Neoplea sp	+
45100	Palmacorixa sp	+
51300	Neureclipsis sp	1+
51500	Phylocentropus sp	+
52200	Cheumatopsyche sp	3+
53800	Hydroptila sp	6
54100	Neotrichia sp	2
57900	Pycnopsyche sp	1+
59580	Oecetis persimilis	37
60300	Dineutus sp	+
67500	Laccobius sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	2+
68708	Dubiraphia vittata group	10+
68901	Macronychus glabratus	12
72340	Dixella sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	24
77120	Ablabesmyia mallochi	105
77130	Ablabesmyia rhamphe group	42+
77750	Thienemannimyia sp	+
80370	Corynoneura lobata	14+
80420	Cricotopus (C.) bicinctus	10
81280	Nanocladius (Plecopteracoluthus) downesi	+
81825	Rheocricotopus (Psilocricotopus) robacki	21+
83040	Dicrotendipes neomodestus	220
83840	Microtendipes pedellus group	21
83900	Nilothauma sp	63
84470	Polypedilum (P.) illinoense	10+
84540	Polypedilum (Tripodura) scalaenum group	10
84790	Tribelos fuscicorne	32
84800	Tribelos jucundum	21
85625	Rheotanytarsus sp	105
85800	Tanytarsus sp	74
85821	Tanytarsus glabrescens group sp 7	84
98001	Sphaeriidae	12

Station: W03W25 L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32 0:00 8/31/16

Rivercode: 09-510-000 River Mile: 24.55

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
26	14	10	0	43	1,224	11	48	N/A	0.40 NORMAL

	Taxa	Quant/Qual
06201	Hyalella sp	+
11130	Baetis intercalaris	405+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	8+
13510	Maccaffertium exiguum	256+
16700	Tricorythodes sp	2
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
47600	Sialis sp	1
48410	Corydalus cornutus	1+
50315	Chimarra obscura	4+
51300	Neureclipsis sp	13+
52200	Cheumatopsyche sp	205+
52530	Hydropsyche depravata group	41+
52570	Hydropsyche simulans	71+
53800	Hydroptila sp	21+
57900	Pycnopsyche sp	+
59720	Triaenodes ignitus	+
59724	Triaenodes injustus	+
60300	Dineutus sp	+
68601	Ancyronyx variegatus	1+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	90+
73601	Simuliidae	1
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	19
80370	Corynoneura lobata	26
80410	Cricotopus (C.) sp	7
80420	Cricotopus (C.) bicinctus	8
81825	Rheocricotopus (Psilocricotopus) robacki	21
82121	Thienemanniella lobapodema	1
84410	Polypedilum (Pentapedilum) tritum	1
84450	Polypedilum (Uresipedilum) flavum	1
84460	Polypedilum (P.) fallax group	5
85625	Rheotanytarsus sp	2
85800	Tanytarsus sp	2
85802	Tanytarsus n. sp. near curticornis	1
85821	Tanytarsus glabrescens group sp 7	8
86200	Tabanus sp	+
87540	Hemerodromia sp	2
97601	Corbicula fluminea	+

Station: W03K10 L. RACCOON CREEK @ BUCKEYE FURNACE RD. 0:00 8/31/16

Rivercode: 09-510-000 River Mile: 18.45

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
24	11	8	0	51	559	13	38	N/A	0.40 NORMAL

	Taxa	Quant/Qual
01801	Turbellaria	+
01900	Nemertea	17
03600	Oligochaeta	18
06201	Hyalella sp	+
11130	Baetis intercalaris	17+
11150	Labiobaetis propinquus	1+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	2
11670	Procloeon viridoculare	+
12200	Isonychia sp	2
13510	Maccaffertium exiguum	11
17200	Caenis sp	2
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	13
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
50315	Chimarra obscura	22+
51300	Neureclipsis sp	43+
51400	Nyctiophylax sp	13
51600	Polycentropus group	2
52200	Cheumatopsyche sp	15+
52530	Hydropsyche depravata group	+
53800	Hydroptila sp	4
57900	Pycnopsyche sp	+
59500	Oecetis sp	3
59724	Triaenodes injustus	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68700	Dubiraphia sp	19
68901	Macronychus glabratus	12
74501	Ceratopogonidae	53+
77500	Conchapelopia sp	51+
78140	Labrundinia pilosella	3
78401	Natarsia species A (sensu Roback, 1978)	3+
78450	Nilotanypus fimbriatus	3
80410	Cricotopus (C.) sp	13
80420	Cricotopus (C.) bicinctus	6
81825	Rheocricotopus (Psilocricotopus) robacki	124
82121	Thienemanniella lobapodema	8
84460	Polypedilum (P.) fallax group	16
84540	Polypedilum (Tripodura) scalaenum group	3
84700	Stenochironomus sp	3
84800	Tribelos jucundum	3
84960	Pseudochironomus sp	3
85625	Rheotanytarsus sp	10
85800	Tanytarsus sp	3
85821	Tanytarsus glabrescens group sp 7	38
97601	Corbicula fluminea	+

Station: W03S06 L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD. 0:00 9/6/16

Rivercode: 09-510-000 River Mile: 12.71

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
40	16	14	0	62	450	17	42	N/A	0.20 NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
01320	Hydra sp	1
01801	Turbellaria	12
01900	Nemertea	22
03600	Oligochaeta	1
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	1+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11651	Procloeon sp (w/o hindwing pads)	7
11670	Procloeon viridoculare	+
13400	Stenacron sp	7+
13510	Maccaffertium exiguum	51+
16700	Tricorythodes sp	62+
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	1+
22300	Argia sp	8+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
27340	Helocordulia uhleri	+
51300	Neureclipsis sp	5+
51400	Nyctiophylax sp	1
51600	Polycentropus group	+
52200	Cheumatopsyche sp	1
52530	Hydropsyche depravata group	+
53800	Hydroptila sp	1
54100	Neotrichia sp	2
55520	Brachycentrus numerosus	+
57900	Pycnopsyche sp	+
59580	Oecetis persimilis	3+
59700	Triaenodes sp	+
60900	Peltodytes sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	22+
68901	Macronychus glabratus	6+
74501	Ceratopogonidae	27+
77120	Ablabesmyia mallochi	4+
77500	Conchapelopia sp	15+
78140	Labrundinia pilosella	2
80360	Corynoneura floridaensis	2
80370	Corynoneura lobata	3
80410	Cricotopus (C.) sp	20
80420	Cricotopus (C.) bicinctus	+
81825	Rheocricotopus (Psilocricotopus) robacki	33+
82121	Thienemanniella lobapodema	4
82820	Cryptochironomus sp	2
83040	Dicrotendipes neomodestus	7
84460	Polypedilum (P.) fallax group	19
84470	Polypedilum (P.) illinoense	2
84540	Polypedilum (Tripodura) scalaenum group	7
85625	Rheotanytarsus sp	13
85800	Tanytarsus sp	13
85821	Tanytarsus glabrescens group sp 7	55
86100	Chrysops sp	+
86200	Tabanus sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	8+

Station: W03K09 L. RACCOON CREEK @ JACKSON/GALLIA COUNTY LINE 0:00 9/7/16

Rivercode: 09-510-000 River Mile: 11.00

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
28	14	13	0	57	951	17	44	N/A	0.50 NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
01900	Nemertea	24
03600	Oligochaeta	88+
11150	Labiobaetis propinquus	2+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	11+
13400	Stenacron sp	36+
13510	Maccaffertium exiguum	69+
13561	Maccaffertium pulchellum	124
16700	Tricorythodes sp	4
17200	Caenis sp	6
21200	Calopteryx sp	+
22300	Argia sp	3+
23909	Boyeria vinosa	+
24700	Dromogomphus sp	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
27600	Epitheca (Tetragoneuria) sp	+
30000	Plecoptera	4
50315	Chimarra obscura	48+
51300	Neureclipsis sp	3+
52200	Cheumatopsyche sp	61+
52530	Hydropsyche depravata group	1
54100	Neotrichia sp	2
55520	Brachycentrus numerosus	+
57900	Pycnopsyche sp	+
59730	Triaenodes melaca	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	2+
68700	Dubiraphia sp	2
68901	Macronychus glabratus	6+
71100	Hexatoma sp	4
74501	Ceratopogonidae	14
77120	Ablabesmyia mallochi	5
77500	Conchapelopia sp	68
77750	Thienemannimyia sp	+
77800	Helopelopia sp	5
80360	Corynoneura floridaensis	8
80370	Corynoneura lobata	4
81825	Rheocricotopus (Psilocricotopus) robacki	47
82121	Thienemanniella lobapodema	4
84210	Paratendipes albimanus or P. duplicatus	5
84315	Phaenopsectra flavipes	5
84450	Polypedilum (Uresipedilum) flavum	5
84460	Polypedilum (P.) fallax group	31
84520	Polypedilum (Tripodura) halterale group	16
84540	Polypedilum (Tripodura) scalaenum group	57
85625	Rheotanytarsus sp	56
85800	Tanytarsus sp	57
85801	Tanytarsus sp 1	5
85802	Tanytarsus n. sp. near curticornis	10
85821	Tanytarsus glabrescens group sp 7	42
87540	Hemerodromia sp	2
97601	Corbicula fluminea	5+

Station: W03P04 L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325 0:00 9/7/16

Rivercode: 09-510-000 River Mile: 1.17

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow	
48	22	21	0	63	3,387	21	52	N/A	0.10	NORMAL

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
01320	Hydra sp	8
01900	Nemertea	18
03600	Oligochaeta	82+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	24
11130	Baetis intercalaris	72+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	4+
11670	Procloeon viridoculare	+
12200	Isonychia sp	120+
13000	Leucrocuta sp	+
13400	Stenacron sp	34+
13510	Maccaffertium exiguum	958+
13561	Maccaffertium pulchellum	204+
13570	Maccaffertium terminatum	247+
16700	Tricorythodes sp	56+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22300	Argia sp	2+
23909	Boyeria vinosa	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
48410	Corydalus cornutus	+
50315	Chimarra obscura	145+
51300	Neureclipsis sp	43+
52200	Cheumatopsyche sp	220+
52530	Hydropsyche depravata group	9+
52570	Hydropsyche simulans	3+
54100	Neotrichia sp	16
55520	Brachycentrus numerosus	+
57900	Pycnopsyche sp	+
59580	Oecetis persimilis	9+
59700	Triaenodes sp	+
60300	Dineutus sp	+
60900	Peltodytes sp	+
68130	Helichus sp	1+
68601	Ancyronyx variegatus	22
68708	Dubiraphia vittata group	2+
68901	Macronychus glabratus	159+
74501	Ceratopogonidae	12
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	83
78450	Nilotanypus fimbriatus	8
80370	Corynoneura lobata	4
80410	Cricotopus (C.) sp	31+
80420	Cricotopus (C.) bicinctus	10
81825	Rheocricotopus (Psilocricotopus) robacki	63
82730	Chironomus (C.) decorus group	+
83040	Dicrotendipes neomodestus	+
84450	Polypedilum (Uresipedilum) flavum	42+
84520	Polypedilum (Tripodura) halterale group	+
84540	Polypedilum (Tripodura) scalaenum group	11
84700	Stenochironomus sp	10
84888	Xenochironomus xenolabis	+
85264	Cladotanytarsus vanderwulpi group sp 4	+
85625	Rheotanytarsus sp	603+
85800	Tanytarsus sp	10+
85801	Tanytarsus sp 1	21
87540	Hemerodromia sp	20
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	1+

Station: W03P15 DEER CREEK NEAR VINTON, NEAR MOUTH ADJ. ST. RT. 325 0:00 9/12/16

Rivercode: 09-511-000 River Mile: 0.20

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
10	0	0	0	10		0		Very Poor	INTERMITT

Taxa	Quant/Qual
03600 Oligochaeta	+
23909 Boyeria vinosa	+
27600 Epitheca (Tetragoneuria) sp	+
45400 Trichocorixa sp	+
63300 Hydroporini	+
67800 Tropisternus sp	+
68901 Macronychus glabratus	+
72600 Aedes sp	+
89501 Ephydridae	+
95100 Physella sp	+

Station: W03S48 DICKASON RUN @ KEYSTONE FURNACE RD. 0:00 7/12/16

Rivercode: 09-514-000 River Mile: 2.37

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
49	11	6	0	49		6		Marginally Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11150	Labiobaetis propinquus	+
11172	Plauditus punctiventris	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23600	Aeshna sp	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
25010	Hagenius brevistylus	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
28001	Libellulidae	+
29000	Sympetrum sp	+
42700	Belostoma sp	+
47600	Sialis sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
54300	Oxyethira sp	+
59550	Oecetis inconspicua complex sp A (sensu Floyd, 1995)	+
59728	Triaenodes marginatus	+
63300	Hydroporini	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
71900	Tipula sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77750	Thienemannimyia sp	+
80420	Cricotopus (C.) bicinctus	+
80490	Cricotopus (Isocladius) intersectus group	+
81712	Psectrocladius (P.) psilopterus group	+
84470	Polypedilum (P.) illinoense	+
84540	Polypedilum (Tripodura) scalaenum group	+
84601	Saetheria species 1 (sensu Jackson, 1977)	+
84800	Tribelos jucundum	+
85800	Tanytarsus sp	+
95100	Physella sp	+
97601	Corbicula fluminea	+
99100	Pyganodon grandis	+

Station: W03P43 DICKASON RUN NEAR KEYSTONE @ ORPHEUS-KEYSTONE RD. 0:00 9/6/16

Rivercode: 09-514-000 River Mile: 0.11

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	14	12	1	55	707	15	42	N/A	0.30 NORMAL

	Taxa	Quant/Qual
01900	Nemertea	4
03600	Oligochaeta	6
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	5+
17200	Caenis sp	15+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	7
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	1+
26700	Macromia sp	+
50315	Chimarra obscura	1
51300	Neureclipsis sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	12
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	2+
59580	Oecetis persimilis	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
68708	Dubiraphia vittata group	16+
68901	Macronychus glabratus	+
72700	Anopheles sp	+
74501	Ceratopogonidae	14
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	45+
78140	Labrundinia pilosella	2
78450	Nilotanypus fimbriatus	6
80360	Corynoneura floridaensis	12
80370	Corynoneura lobata	12
81650	Parametriocnemus sp	7
81825	Rheocricotopus (Psilocricotopus) robacki	52
82101	Thienemanniella taurocapita	4
83900	Nilothauma sp	13
84210	Paratendipes albimanus or P. duplicatus	13
84460	Polypedilum (P.) fallax group	32
84470	Polypedilum (P.) illinoense	7
84540	Polypedilum (Tripodura) scalaenum group	45
84790	Tribelos fuscicorne	6
85625	Rheotanytarsus sp	7+
85800	Tanytarsus sp	136
85801	Tanytarsus sp 1	1
85802	Tanytarsus n. sp. near curticornis	71
85821	Tanytarsus glabrescens group sp 7	149
86100	Chrysops sp	1+
87540	Hemerodromia sp	2
97601	Corbicula fluminea	1+

Station: W03S10 MEADOW RUN UPST. JENO'S 0:00 8/24/16

Rivercode: 09-524-000 River Mile: 3.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	7	4	0	31		4		Fair	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11250	Neocloeon sp	+
11251	Anafroptilum sp	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23600	Aeshna sp	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
26700	Macromia sp	+
27500	Somatochlora sp	+
45400	Trichocorixa sp	+
48220	Chauliodes rastricornis	+
63300	Hydroporini	+
67300	Hydrochus sp	+
68708	Dubiraphia vittata group	+
72700	Anopheles sp	+
72900	Culex sp	+
77120	Ablabesmyia mallochi	+
85800	Tanytarsus sp	+
86100	Chrysops sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
98600	Sphaerium sp	+

Station: W03W27 MEADOW RUN @ OLD/NEW ST. RT. 327, DST.TRIBS (RM 2.18) 0:00 7/19/16

Rivercode: 09-524-000 River Mile: 2.16

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
32	9	2	0	32		2		Fair	NORMAL

	Taxa	Quant/Qual
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11200	Callibaetis sp	+
11250	Neocloeon sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23600	Aeshna sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
43300	Ranatra sp	+
45400	Trichocorixa sp	+
50315	Chimarra obscura	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
53501	Hydroptilidae	+
55300	Ptilostomis sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
71300	Limonia sp	+
71900	Tipula sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
77750	Thienemannimyia sp	+
82820	Cryptochironomus sp	+
84470	Polypedilum (P.) illinoense	+
94400	Fossaria sp	+
96002	Helisoma anceps anceps	+

Station: W03W18 MEADOW RUN E OF WELLSTON @ CHEATWOOD RD/T-383 0:00 9/9/16

Rivercode: 09-524-000 River Mile: 0.72

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
28	4	1	0	28		1		Low Fair	NORMAL

	Taxa	Quant/Qual
01801	Turbellaria	+
03600	Oligochaeta	+
04637	Placobdella phalera	+
04686	Placobdella papillifera	+
11200	Callibaetis sp	+
11250	Neocloeon sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
27500	Somatochlora sp	+
28955	Plathemis lydia	+
45400	Trichocorixa sp	+
50000	Trichoptera	+
53800	Hydroptila sp	+
60900	Peltodytes sp	+
64050	Liodessus sp	+
65800	Berosus sp	+
66700	Helochares maculicollis	+
67300	Hydrochus sp	+
67500	Laccobius sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
77355	Clinotanypus pinguis	+
83040	Dicrotendipes neomodestus	+
84300	Phaenopsectra obediens group	+
84470	Polypedilum (P.) illinoense	+
84520	Polypedilum (Tripodura) halterale group	+
96120	Menetus (Micromenetus) dilatatus	+

Station: 303688 MCCONNEL RUN AT LAKE RD (CR 15) N OF LAKE RUPERT 0:00 7/26/16

Rivercode: 09-528-000 River Mile: 1.98

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
51	15	13	6	51		13		Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04686	Placobdella papillifera	+
07820	Cambarus (Cambarus) bartonii cavatus	+
08601	Hydrachnidia	+
11018	Acerpenna macdunnoughi	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
15000	Paraleptophlebia sp	+
21200	Calopteryx sp	+
23909	Boyeria vinosa	+
26100	Cordulegaster sp	+
27500	Somatochlora sp	+
33100	Leuctra sp	+
34130	Acroneuria frisoni	+
47600	Sialis sp	+
48200	Chauliodes sp	+
50301	Chimarra aterrima	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
55107	Oligostomis pardalis	+
57400	Neophylax sp	+
57900	Pycnopsyche sp	+
60400	Gyrinus sp	+
63300	Hydroporini	+
67700	Paracymus sp	+
68130	Helichus sp	+
69400	Stenelmis sp	+
70700	Dicranota sp	+
71100	Hexatoma sp	+
71800	Pseudolimnophila sp	+
71900	Tipula sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
77120	Ablabesmyia mallochi	+
77800	Helopelopia sp	+
78350	Meropelopia sp	+
81650	Parametriocnemus sp	+
83840	Microtendipes pedellus group	+
84155	Paralauterborniella nigrohalteralis	+
84440	Polypedilum (Uresipedilum) aviceps	+
84450	Polypedilum (Uresipedilum) flavum	+
84470	Polypedilum (P.) illinoense	+
85625	Rheotanytarsus sp	+
85800	Tanytarsus sp	+
86100	Chrysops sp	+
87540	Hemerodromia sp	+
95100	Physella sp	+

Station: W03W06 ELK FORK NEAR MCARTHUR, UPST. PUNCHEON FORK @ GRAVEL ROAD 0:00 7/13/17

Rivercode: 09-530-000 River Mile: 13.90

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
43	16	11	1	43		11		Very Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11018	Acerpenna macdunnoughi	+
11118	Plauditus dubius	+
11150	Labiobaetis propinquus	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26700	Macromia sp	+
34500	Perlesta sp	+
47600	Sialis sp	+
50315	Chimarra obscura	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
53800	Hydroptila sp	+
59580	Oecetis persimilis	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
65800	Berosus sp	+
66500	Enochrus sp	+
68130	Helichus sp	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71900	Tipula sp	+
74100	Simulium sp	+
77800	Helopelopia sp	+
81650	Parametriocnemus sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
83040	Dicrotendipes neomodestus	+
84450	Polypedilum (Uresipedilum) flavum	+
85200	Cladotanytarsus sp	+
85800	Tanytarsus sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
98600	Sphaerium sp	+

Station: W03P30 ELK FORK 1 MI. E OF MCARTHUR @ ST. RT. 50 0:00 9/13/16

Rivercode: 09-530-000 River Mile: 13.26

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
38	12	9	0	38		9		Good	NORMAL

	Taxa	Quant/Qual
03040	Fredericella sp	+
03600	Oligochaeta	+
04666	Helobdella papillata	+
11130	Baetis intercalaris	+
11200	Callibaetis sp	+
11250	Neocloeon sp	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
25010	Hagenius brevistylus	+
25410	Progomphus obscurus	+
50315	Chimarra obscura	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
59580	Oecetis persimilis	+
59700	Triaenodes sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
72900	Culex sp	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
83040	Dicrotendipes neomodestus	+
84450	Polypedilum (Uresipedilum) flavum	+
84470	Polypedilum (P.) illinoense	+
85615	Rheotanytarsus pellucidus	+
85625	Rheotanytarsus sp	+
96002	Helisoma anceps anceps	+
98600	Sphaerium sp	+
99880	Lampsilis cardium	+

Station: W03W14 ELK FORK SW OF PRATTSVILLE @ GRAVEL ROAD DST. WOLF RUN 0:00 8/24/16

Rivercode: 09-530-000 River Mile: 8.55

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
43	19	14	0	57	2,786	16	42	N/A	NORMAL

	Taxa	Quant/Qual
01900	Nemertea	2
03600	Oligochaeta	57+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11130	Baetis intercalaris	17+
11150	Labiobaetis propinquus	+
11260	Anafroptilum minor group sp 1	+
11650	Procloeon sp (w/ hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	85+
13400	Stenacron sp	9+
13561	Maccaffertium pulchellum	2
13590	Maccaffertium vicarium	1
17200	Caenis sp	8+
17600	Baetisca sp	+
21200	Calopteryx sp	2+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	2+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
26700	Macromia sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	1+
50315	Chimarra obscura	383+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	729+
52530	Hydropsyche depravata group	1+
54300	Oxyethira sp	+
55300	Ptilostomis sp	+
57900	Pycnopsyche sp	+
59001	Leptoceridae	+
59310	Mystacides sepulchralis	+
59580	Oecetis persimilis	+
60300	Dineutus sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	3+
68708	Dubiraphia vittata group	1+
68901	Macronychus glabratus	4
69400	Stenelmis sp	32
74100	Simulium sp	+
74501	Ceratopogonidae	265
77500	Conchapelopia sp	102+
78450	Nilotanypus fimbriatus	29
80370	Corynoneura lobata	16
81825	Rheocricotopus (Psilocricotopus) robacki	307+
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
84450	Polypedilum (Uresipedilum) flavum	29
85625	Rheotanytarsus sp	337
85800	Tanytarsus sp	44
85802	Tanytarsus n. sp. near curticornis	44
85821	Tanytarsus glabrescens group sp 7	220
87540	Hemerodromia sp	29+
95100	Physella sp	1
96002	Helisoma anceps anceps	+
96900	Ferrissia sp	16+
97601	Corbicula fluminea	8+
99100	Pyganodon grandis	+
99860	Lampsilis siliquoidea	+

Station: W03P31 ELK FORK NE OF RADCLIFF @ CO. RD. 43B 0:00 8/30/16

Rivercode: 09-530-000 River Mile: 0.01

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
33	14	11	0	33		11		Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11130	Baetis intercalaris	+
11150	Labiobaetis propinquus	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13510	Maccaffertium exiguum	+
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
26100	Cordulegaster sp	+
27400	Neurocordulia sp	+
50315	Chimarra obscura	+
51300	Neureclipsis sp	+
52200	Cheumatopsyche sp	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
60300	Dineutus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
77120	Ablabesmyia mallochi	+
85625	Rheotanytarsus sp	+
97601	Corbicula fluminea	+

Station: W03W09 TRIB. TO ELK FORK (11.17) E OF MCARTHUR @ CO. RD. 7 0:00 7/27/16

Rivercode: 09-530-004 River Mile: 0.43

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	10	5	1	45		5		Marginally Good	NORMAL

	Taxa	Quant/Qual
03360	Plumatella sp	+
03600	Oligochaeta	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11670	Procloeon viridoculare	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
24501	Gomphidae	+
27500	Somatochlora sp	+
29000	Sympetrum sp	+
47600	Sialis sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
53800	Hydroptila sp	+
59728	Triaenodes marginatus	+
59730	Triaenodes melaca	+
60201	Gyrinidae	+
60900	Peltodytes sp	+
65800	Berosus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
78350	Meropelopia sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
78655	Procladius (Holotanypus) sp	+
82730	Chironomus (C.) decorus group	+
82885	Cryptotendipes pseudotener	+
84470	Polypedilum (P.) illinoense	+
84800	Tribelos jucundum	+
85625	Rheotanytarsus sp	+
86100	Chrysops sp	+
87190	Odontomyia (Catatasina) sp	+
94400	Fossaria sp	+
95100	Physella sp	+
98200	Pisidium sp	+

Station: 203947 WOLF RUN SE OF MCARTHUR @ CO. RD. 24 0:00 7/21/16

Rivercode: 09-533-000 River Mile: 3.80

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
29	9	3	0	29		3		Fair	NORMAL

	Taxa	Quant/Qual
01320	Hydra sp	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11651	Procloeon sp (w/o hindwing pads)	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
47600	Sialis sp	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
60300	Dineutus sp	+
60800	Haliplus sp	+
60900	Peltodytes sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
77120	Ablabesmyia mallochi	+
77355	Clinotanypus pinguis	+
84700	Stenochironomus sp	+
86100	Chrysops sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+

Station: W03K30 PUNCHEON FORK UPST. MCARTHUR @ TWP. RD. 20 0:00 7/21/16

Rivercode: 09-534-000 River Mile: 2.82

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
33	15	10	2	33		10		Good	NORMAL

	Taxa	Quant/Qual
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11119	Plauditus dubius or P. virilis	+
11120	Baetis flavistriga	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
27500	Somatochlora sp	+
34500	Perlesta sp	+
47600	Sialis sp	+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
56650	Goera sp.	+
57400	Neophylax sp	+
57900	Pycnopsyche sp	+
59310	Mystacides sepulchralis	+
59730	Triaenodes melaca	+
60400	Gyrinus sp	+
68130	Helichus sp	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71900	Tipula sp	+
72340	Dixella sp	+
77800	Helopelopia sp	+
78601	Pentaneura inyoensis	+
81650	Parametriocnemus sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
84315	Phaenopsectra flavipes	+
84750	Stictochironomus sp	+
87601	Dolichopodidae	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+

Station: W03W07 PUNCHEON FORK E OF MCARTHUR @ TWP. RD. 11 0:00 7/28/16

Rivercode: 09-534-000 River Mile: 0.28

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
46	6	1	1	46		1		Very Poor	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04666	Helobdella papillata	+
04930	Erpobdella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11130	Baetis intercalaris	+
11250	Neocloeon sp	+
13400	Stenacron sp	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23600	Aeshna sp	+
23804	Basiaeschna janata	+
27340	Helocordulia uhleri	+
27500	Somatochlora sp	+
47600	Sialis sp	+
48200	Chauliodes sp	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
60900	Peltodytes sp	+
67700	Paracymus sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
71900	Tipula sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	+
77800	Helopelopia sp	+
78140	Labrundinia pilosella	+
78350	Meropelopia sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
78655	Procladius (Holotanypus) sp	+
82730	Chironomus (C.) decorus group	+
82820	Cryptochironomus sp	+
83040	Dicrotendipes neomodestus	+
83051	Dicrotendipes simpsoni	+
84450	Polypedilum (Uresipedilum) flavum	+
84460	Polypedilum (P.) fallax group	+
85500	Paratanytarsus sp	+
85625	Rheotanytarsus sp	+
85800	Tanytarsus sp	+
85821	Tanytarsus glabrescens group sp 7	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
98200	Pisidium sp	+
98600	Sphaerium sp	+

Station: W03W07 PUNCHEON FORK E OF MCARTHUR @ TWP. RD. 11 0:00 9/13/16

Rivercode: 09-534-000 River Mile: 0.28

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
24	0	0	0	24		0		Very Poor	NORMAL

	Taxa	Quant/Qual
01801	Turbellaria	+
04666	Helobdella papillata	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
27340	Helocordulia uhleri	+
66500	Enochrus sp	+
71900	Tipula sp	+
72700	Anopheles sp	+
77500	Conchapelopia sp	+
77750	Thienemannimyia sp	+
77800	Helopelopia sp	+
82730	Chironomus (C.) decorus group	+
82820	Cryptochironomus sp	+
83051	Dicrotendipes simpsoni	+
84450	Polypedilum (Uresipedilum) flavum	+
84470	Polypedilum (P.) illinoense	+
84540	Polypedilum (Tripodura) scalaenum group	+
85500	Paratanytarsus sp	+
85625	Rheotanytarsus sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
98600	Sphaerium sp	+

Station: W03P36 INDIAN CREEK UPST. RIO GRANDE WWTP @ ST. RT. 325 0:00 7/26/16

Rivercode: 09-539-000 River Mile: 1.58

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
34	15	10	1	34		10		Good	NORMAL

	Taxa	Quant/Qual
01801	Turbellaria	+
03360	Plumatella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
17200	Caenis sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50301	Chimarra aterrima	+
50315	Chimarra obscura	+
50804	Lype diversa	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59720	Triaenodes ignitus	+
68130	Helichus sp	+
68901	Macronychus glabratus	+
71900	Tipula sp	+
74100	Simulium sp	+
77120	Ablabesmyia mallochi	+
77800	Helopelopia sp	+
81650	Parametriocnemus sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
83900	Nilothauma sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	+

Station: W03W55 INDIAN CREEK DST. RIO GRANDE WWTP, UPST. L. INDIAN CREEK 0:00 7/26/16

Rivercode: 09-539-000 River Mile: 1.45

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
39	17	12	0	39		12		Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04686	Placobdella papillifera	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11018	Acerpenna macdunnoughi	+
11120	Baetis flavistriga	+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
27500	Somatochlora sp	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
60900	Peltodytes sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
84450	Polypedilum (Uresipedilum) flavum	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	+

Station: W03P14 L. INDIAN CREEK N OF RIO GRANDE @ ST. RT. 325 0:00 7/26/16

Rivercode: 09-540-000 River Mile: 0.17

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
30	13	8	0	30		8		Good	NORMAL

	Taxa	Quant/Qual
04686	Placobdella papillifera	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25010	Hagenius brevistylus	+
27400	Neurocordulia sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	+
57900	Pycnopsyche sp	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
71900	Tipula sp	+
77800	Helopelopia sp	+
86100	Chrysops sp	+
95100	Physella sp	+

Station: 203953 BARREN CREEK N OF HARRISBURG, NEAR MOUTH 0:00 7/27/16

Rivercode: 09-542-000 River Mile: 0.30

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
36	16	10	0	36		10		Good	NORMAL

	Taxa	Quant/Qual
03360	Plumatella sp	+
03600	Oligochaeta	+
05900	Lirceus sp	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11018	Acerpenna macdunnoughi	+
11130	Baetis intercalaris	+
11250	Neocloeon sp	+
11430	Diphetor hageni	+
11650	Procloeon sp (w/ hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
50301	Chimarra aterrima	+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59720	Triaenodes ignitus	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
77120	Ablabesmyia mallochi	+
77130	Ablabesmyia rhamphe group	+
78401	Natarsia species A (sensu Roback, 1978)	+
84540	Polypedilum (Tripodura) scalaenum group	+
85800	Tanytarsus sp	+
87540	Hemerodromia sp	+
96900	Ferrissia sp	+

Station: W03S40 ROBINSON RUN N OF VINTON @ ST. RT. 325 0:00 9/12/16

Rivercode: 09-544-000 River Mile: 0.18

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
37	13	8	0	37		8		Good	LOW

	Taxa	Quant/Qual
02600	Nematomorpha	+
03600	Oligochaeta	+
04686	Placobdella papillifera	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26700	Macromia sp	+
27500	Somatochlora sp	+
47600	Sialis sp	+
52200	Cheumatopsyche sp	+
55300	Ptilostomis sp	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
63300	Hydroporini	+
68130	Helichus sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
82820	Cryptochironomus sp	+
84210	Paratendipes albimanus or P. duplicatus	+
84520	Polypedilum (Tripodura) halterale group	+
84800	Tribelos jucundum	+
96900	Ferrissia sp	+

Station: W03S36 STRONGS RUN E OF WILKESVILLE @ TWP. RD. 24 0:00 8/18/16

Rivercode: 09-546-000 River Mile: 5.90

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	13	9	0	31		9		Good	NORMAL

	Taxa	Quant/Qual
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11018	Acerpenna macdunnoughi	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11430	Diphetor hageni	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23600	Aeshna sp	+
24900	Gomphus Complex	+
28500	Libellula sp	+
47600	Sialis sp	+
52200	Cheumatopsyche sp	+
55300	Ptilostomis sp	+
57900	Pycnopsyche sp	+
68130	Helichus sp	+
71100	Hexatoma sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
77120	Ablabesmyia mallochi	+
77355	Clinotanypus pinguis	+
77500	Conchapelopia sp	+
81231	Nanocladius (N.) crassicornus or N. (N.) "rectinervis"	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
84800	Tribelos jucundum	+
85800	Tanytarsus sp	+

Station: W03S47 STRONGS RUN NE OF EWINGTON @ ADNEY RD. 0:00 7/12/16

Rivercode: 09-546-000 River Mile: 0.58

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
54	18	14	1	54		14		Very Good	NORMAL

	Taxa	Quant/Qual
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
27500	Somatochlora sp	+
44501	Corixidae	+
47600	Sialis sp	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
57900	Pycnopsyche sp	+
59580	Oecetis persimilis	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
63300	Hydroporini	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
71700	Pilaria sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	+
78350	Meropelopia sp	+
80420	Cricotopus (C.) bicinctus	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
82730	Chironomus (C.) decorus group	+
82820	Cryptochironomus sp	+
84450	Polypedilum (Uresipedilum) flavum	+
84605	Saetheria hirta	+
84800	Tribelos jucundum	+
85625	Rheotanytarsus sp	+
85800	Tanytarsus sp	+
95100	Physella sp	+
97601	Corbicula fluminea	+
98600	Sphaerium sp	+

Station: 203956 WILLIAMS RUN SE OF WILKESVILLE @ MOUTH 0:00 8/18/16

Rivercode: 09-547-000 River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
29	11	5	0	29		5		Marginally Good	NORMAL

	Taxa	Quant/Qual
04660	Helobdella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
24900	Gomphus Complex	+
26100	Cordulegaster sp	+
44501	Corixidae	+
47600	Sialis sp	+
51400	Nyctiophylax sp	+
51500	Phylocentropus sp	+
52200	Cheumatopsyche sp	+
55300	Ptilostomis sp	+
57900	Pycnopsyche sp	+
60400	Gyrinus sp	+
67700	Paracymus sp	+
68708	Dubiraphia vittata group	+
72340	Dixella sp	+
72700	Anopheles sp	+
78101	Labrundinia becki	+
78655	Procladius (Holotanypus) sp	+
82820	Cryptochironomus sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+

Station: W03S39 FLATLICK RUN S OF WILKESVILLE @ NEWSOME RD. (CO. RD. 8) 0:00 9/12/16

Rivercode: 09-549-000 River Mile: 0.60

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
26	7	4	0	26		4		Fair	LOW

	Taxa	Quant/Qual
11250	Neocloeon sp	+
14950	small Leptophlebiidae	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
23909	Boyeria vinosa	+
24501	Gomphidae	+
25010	Hagenius brevistylus	+
25410	Progomphus obscurus	+
47600	Sialis sp	+
51500	Phylocentropus sp	+
55300	Ptilostomis sp	+
57900	Pycnopsyche sp	+
59730	Triaenodes melaca	+
60900	Peltodytes sp	+
63300	Hydroporini	+
68130	Helichus sp	+
72700	Anopheles sp	+
82730	Chironomus (C.) decorus group	+
84210	Paratendipes albimanus or P. duplicatus	+
84470	Polypedilum (P.) illinoense	+
84601	Saetheria species 1 (sensu Jackson, 1977)	+
86100	Chrysops sp	+
87601	Dolichopodidae	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
98600	Sphaerium sp	+

Station: W03W56 INDIANCAMP RUN SW OF CLARION, ADJ. CO. RD. 26 0:00 7/14/16

Rivercode: 09-551-000 River Mile: 0.30

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	11	9	1	45		9		Marginally Good	NORMAL

Taxa	Quant/Qual
02600 Nematomorpha	+
08601 Hydrachnidia	+
11018 Acerpenna macdunnoughi	+
11200 Callibaetis sp	+
11250 Neocloeon sp	+
13521 Stenonema femoratum	+
17200 Caenis sp	+
22001 Coenagrionidae	+
22300 Argia sp	+
23600 Aeshna sp	+
23804 Basiaeschna janata	+
26700 Macromia sp	+
27001 Corduliidae	+
33100 Leuctra sp	+
47600 Sialis sp	+
48620 Nigronia serricornis	+
50301 Chimarra aterrima	+
50804 Lype diversa	+
52200 Cheumatopsyche sp	+
52530 Hydropsyche depravata group	+
57900 Pycnopsyche sp	+
60400 Gyrinus sp	+
60800 Haliplus sp	+
60900 Peltodytes sp	+
63300 Hydroporini	+
67700 Paracymus sp	+
68130 Helichus sp	+
68708 Dubiraphia vittata group	+
69400 Stenelmis sp	+
71100 Hexatoma sp	+
71800 Pseudolimnophila sp	+
72340 Dixella sp	+
72700 Anopheles sp	+
74100 Simulium sp	+
74501 Ceratopogonidae	+
77120 Ablabesmyia mallochi	+
77750 Thienemannimyia sp	+
78130 Labrundinia neopilosella	+
80001 Orthocladiinae	+
83003 Dicrotendipes fumidus	+
84315 Phaenopsectra flavipes	+
85500 Paratanytarsus sp	+
85625 Rheotanytarsus sp	+
85800 Tanytarsus sp	+
95100 Physella sp	+

Station: W03W52 ROCKCAMP RUN NEAR HAWKS @ OLD RR NEAR MOUTH 0:00 7/14/16

Rivercode: 09-552-000 River Mile: 0.11

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
26	6	2	0	26		2		Fair	NORMAL

	Taxa	Quant/Qual
08200	Orconectes sp	+
11200	Callibaetis sp	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23600	Aeshna sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
47600	Sialis sp	+
50301	Chimarra aterrima	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
59700	Triaenodes sp	+
60800	Haliplus sp	+
60900	Peltodytes sp	+
63300	Hydroporini	+
68708	Dubiraphia vittata group	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
83002	Dicrotendipes modestus	+
84800	Tribelos jucundum	+
95100	Physella sp	+

Station: W03L08 PIERCE RUN W OF ORETON, DST. GOB PILE 82001305 0:00 7/19/16

Rivercode: 09-553-000 River Mile: 5.47

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
15	3	2	0	15		2		Poor	NORMAL

	Taxa	Quant/Qual
07701	Cambaridae	+
21001	Calopterygidae	+
22300	Argia sp	+
47600	Sialis sp	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
59720	Triaenodes ignitus	+
65700	Anacaena sp	+
68708	Dubiraphia vittata group	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
78655	Procladius (Holotanypus) sp	+
84315	Phaenopsectra flavipes	+
84540	Polypedilum (Tripodura) scalaenum group	+

Station: W03W47 PIERCE RUN AT RADCLIFF @ TWP. RD. 2 0:00 7/19/16

Rivercode: 09-553-000 River Mile: 1.68

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
22	6	2	0	22		2		Fair	NORMAL

	Taxa	Quant/Qual
08200	Orconectes sp	+
11200	Callibaetis sp	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
34130	Acroneuria frisoni	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
60400	Gyrinus sp	+
60800	Haliplus sp	+
60900	Peltodytes sp	+
68708	Dubiraphia vittata group	+
72700	Anopheles sp	+
78655	Procladius (Holotanypus) sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
96002	Helisoma anceps anceps	+

Station: 203960 LONG RUN N OF VALES MILLS, ADJ CO. RD. 11K 0:00 8/4/16

Rivercode: 09-556-000 River Mile: 1.40

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
38	14	8	2	38		8		Good	LOW

	Taxa	Quant/Qual
01801	Turbellaria	+
05900	Lirceus sp	+
08601	Hydrachnidia	+
11018	Acerpenna macdunnoughi	+
11120	Baetis flavistriga	+
11130	Baetis intercalaris	+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
26100	Cordulegaster sp	+
33100	Leuctra sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
63300	Hydroporini	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
71100	Hexatoma sp	+
71700	Pilaria sp	+
71900	Tipula sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77500	Conchapelopia sp	+
79400	Zavrelimyia (Z.) sp	+
80410	Cricotopus (C.) sp	+
80420	Cricotopus (C.) bicinctus	+
83040	Dicrotendipes neomodestus	+
83820	Microtendipes "caelum" (sensu Simpson & Bode, 1980)	+
84210	Paratendipes albimanus or P. duplicatus	+
84540	Polypedilum (Tripodura) scalaenum group	+
85625	Rheotanytarsus sp	+

Station: W03W51 FLAT RUN SE OF BOLINS MILLS @ U.S. RT. 50 0:00 9/22/16

Rivercode: 09-557-000 River Mile: 1.60

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	18	12	1	45		12		Very Good	LOW

	Taxa	Quant/Qual
00653	Eunapius fragilis	+
03600	Oligochaeta	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11018	Acerpenna macdunnoughi	+
11120	Baetis flavistriga	+
11130	Baetis intercalaris	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
50315	Chimarra obscura	+
52200	Cheumatopsyche sp	+
52440	Ceratopsyche slossonae	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
60300	Dineutus sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
69200	Optioservus sp	+
71100	Hexatoma sp	+
71300	Limonia sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
77355	Clinotanypus pinguis	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
82730	Chironomus (C.) decorus group	+
84450	Polypedilum (Uresipedilum) flavum	+
84470	Polypedilum (P.) illinoense	+
85625	Rheotanytarsus sp	+
86100	Chrysops sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+

Station: W03W45 ONION CREEK SE OF KNOX @ CO. RD. 4 0:00 8/4/16

Rivercode: 09-561-000 River Mile: 1.41

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
51	15	7	1	51		7		Good	NORMAL

	Taxa	Quant/Qual
01801	Turbellaria	+
03600	Oligochaeta	+
04666	Helobdella papillata	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11200	Callibaetis sp	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
18750	Hexagenia limbata	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
26700	Macromia sp	+
27500	Somatochlora sp	+
47600	Sialis sp	+
51400	Nyctiophylax sp	+
51500	Phylocentropus sp	+
51600	Polycentropus group	+
55300	Ptilostomis sp	+
57900	Pycnopsyche sp	+
59555	Oecetis inconspicua complex sp F (sensu Floyd, 1995)	+
59700	Triaenodes sp	+
60400	Gyrinus sp	+
60800	Haliplus sp	+
60900	Peltodytes sp	+
63300	Hydroporini	+
68130	Helichus sp	+
68201	Scirtidae	+
68708	Dubiraphia vittata group	+
72340	Dixella sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
78350	Meropelopia sp	+
78655	Procladius (Holotanypus) sp	+
82730	Chironomus (C.) decorus group	+
82820	Cryptochironomus sp	+
83840	Microtendipes pedellus group	+
84800	Tribelos jucundum	+
85800	Tanytarsus sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
96900	Ferrissia sp	+
97601	Corbicula fluminea	+
98600	Sphaerium sp	+

Station: W03W59 LAUREL RUN NEAR KNOX @ TWP. RD. 18 0:00 7/27/16

Rivercode: 09-562-000 River Mile: 0.16

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
38	10	7	2	38		7		Marginally Good	NORMAL

	Taxa	Quant/Qual
06201	Hyalella sp	+
07860	Cambarus (Puncticambarus) robustus	+
08601	Hydrachnidia	+
11018	Acerpenna macdunnoughi	+
11130	Baetis intercalaris	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24501	Gomphidae	+
26100	Cordulegaster sp	+
27500	Somatochlora sp	+
34130	Acroneuria frisoni	+
47600	Sialis sp	+
51500	Phylocentropus sp	+
55107	Oligostomis pardalis	+
60900	Peltodytes sp	+
63300	Hydroporini	+
67500	Laccobius sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
71700	Pilaria sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	+
78655	Procladius (Holotanypus) sp	+
83840	Microtendipes pedellus group	+
84118	Paracladopelma undine	+
84440	Polypedilum (Uresipedilum) aviceps	+
86100	Chrysops sp	+

Station: W03K37 HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD. 0:00 7/25/16

Rivercode: 09-563-000 River Mile: 13.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
34	11	9	1	34		9		Marginally Good	NORMAL

Taxa	Quant/Qual

Station: W03K37 HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD. 0:00 7/25/16

Rivercode: 09-563-000 River Mile: 13.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
34	11	9	1	34		9		Marginally Good	NORMAL

	Taxa	Quant/Qual
07860	Cambarus (Puncticambarus) robustus	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
13400	Stenacron sp	+
13590	Maccaffertium vicarium	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23909	Boyeria vinosa	+
24501	Gomphidae	+
27500	Somatochlora sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50301	Chimarra aterrima	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59720	Triaenodes ignitus	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
71900	Tipula sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
77120	Ablabesmyia mallochi	+
78450	Nilotanypus fimbriatus	+
78655	Procladius (Holotanypus) sp	+
83840	Microtendipes pedellus group	+
84440	Polypedilum (Uresipedilum) aviceps	+
84800	Tribelos jucundum	+
85615	Rheotanytarsus pellucidus	+
96002	Helisoma anceps anceps	+

Station: W03K37 HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD. 0:00 7/3/17

Rivercode: 09-563-000 River Mile: 13.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
29	8	5	1	29		5		Marginally Good	LOW

	Taxa	Quant/Qual
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
17200	Caenis sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26700	Macromia sp	+
27500	Somatochlora sp	+
47600	Sialis sp	+
50301	Chimarra aterrima	+
51500	Phylocentropus sp	+
52200	Cheumatopsyche sp	+
54300	Oxyethira sp	+
59720	Triaenodes ignitus	+
60300	Dineutus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77115	Ablabesmyia janta	+
77120	Ablabesmyia mallochi	+
78655	Procladius (Holotanypus) sp	+
79400	Zavrelimyia (Z.) sp	+
82800	Cladopelma sp	+
84470	Polypedilum (P.) illinoense	+
84800	Tribelos jucundum	+

Station: 303739 Hewett Fork Adj. Waterloo Aquatic Center 0:00 7/3/17
Rivercode: 09-563-000 River Mile: 8.40

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	12	11	3	45		11		Marginally Good	LOW

	Taxa	Quant/Qual
06201	Hyalella sp	+
07860	Cambarus (Puncticambarus) robustus	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11250	Neocloeon sp	+
17200	Caenis sp	+
21001	Calopterygidae	+
22001	Coenagrionidae	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
25510	Stylogomphus albistylus	+
26700	Macromia sp	+
27000	Corduliidae or Libellulidae	+
33100	Leuctra sp	+
34001	Perlidae	+
48610	Nigronia fasciata	+
50301	Chimarra aterrima	+
50315	Chimarra obscura	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
60300	Dineutus sp	+
65700	Anacaena sp	+
67700	Paracymus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
71900	Tipula sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
77500	Conchapelopia sp	+
77750	Thienemannimyia sp	+
81650	Parametriocnemus sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
82820	Cryptochironomus sp	+
84520	Polypedilum (Tripodura) halterale group	+
85800	Tanytarsus sp	+
85802	Tanytarsus n. sp. near curticornis	+
85818	Tanytarsus glabrescens group sp 4	+
85840	Tanytarsus sepp	+

Station: W03P08 HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20 0:00 8/15/16

Rivercode: 09-563-000 River Mile: 4.31

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
33	18	13	0	45	839	14	44	N/A	2.20 NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	2+
04686	Placobdella papillifera	+
06201	Hyalella sp	+
08200	Orconectes sp	+
08601	Hydrachnidia	2
11130	Baetis intercalaris	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	1+
13510	Maccaffertium exiguum	3
13590	Maccaffertium vicarium	56+
14950	small Leptophlebiidae	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23909	Boyeria vinosa	+
24501	Gomphidae	+
26100	Cordulegaster sp	+
48620	Nigronia serricornis	3+
50301	Chimarra aterrima	23+
50315	Chimarra obscura	96+
51400	Nyctiophylax sp	+
52530	Hydropsyche depravata group	56+
57900	Pycnopsyche sp	+
59500	Oecetis sp	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
68130	Helichus sp	1+
68901	Macronychus glabratus	6+
72700	Anopheles sp	+
74100	Simulium sp	2
77500	Conchapelopia sp	32
80351	Corynoneura caudicula	2
80370	Corynoneura lobata	2
81825	Rheocricotopus (Psilocricotopus) robacki	50+
82121	Thienemanniella lobapodema	2
84450	Polypedilum (Uresipedilum) flavum	27
84460	Polypedilum (P.) fallax group	23
84470	Polypedilum (P.) illinoense	9
85625	Rheotanytarsus sp	411+
85821	Tanytarsus glabrescens group sp 7	9
87540	Hemerodromia sp	21

Station: W03P08 HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20 0:00 7/27/17

Rivercode: 09-563-000 River Mile: 4.31

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
45	19	16	0	45		16		N/A	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04685	Placobdella ornata	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25010	Hagenius brevistylus	+
25410	Progomphus obscurus	+
25510	Stylogomphus albistylus	+
26700	Macromia sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50301	Chimarra aterrima	+
50315	Chimarra obscura	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59300	Mystacides sp	+
59580	Oecetis persimilis	+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
63300	Hydroporini	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
71100	Hexatoma sp	+
74100	Simulium sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
81200	Nanocladius sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
97601	Corbicula fluminea	+

Station: W03P32 HEWETT FORK SE OF LAKE HOPE @ MOUTH 0:00 8/16/16

Rivercode: 09-563-000 River Mile: 0.01

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
31	13	12	0	31		12		Good	NORMAL

	Taxa	Quant/Qual
00401	Spongillidae	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13590	Maccaffertium vicarium	+
17600	Baetisca sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
24900	Gomphus Complex	+
48410	Corydalus cornutus	+
48620	Nigronia serricornis	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59300	Mystacides sp	+
59724	Triaenodes injustus	+
60300	Dineutus sp	+
68130	Helichus sp	+
68901	Macronychus glabratus	+
71910	Tipula abdominalis	+
74501	Ceratopogonidae	+
82822	Cryptochironomus eminentia	+
84470	Polypedilum (P.) illinoense	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+

Station: W03P32 HEWETT FORK SE OF LAKE HOPE @ MOUTH 0:00 7/31/17

Rivercode: 09-563-000 River Mile: 0.01

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
41	13	11	1	41		11		Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04666	Helobdella papillata	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11130	Baetis intercalaris	+
11250	Neocloeon sp	+
11260	Anafroptilum minor group sp 1	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13590	Maccaffertium vicarium	+
17200	Caenis sp	+
17600	Baetisca sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
47600	Sialis sp	+
51300	Neureclipsis sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59300	Mystacides sp	+
59580	Oecetis persimilis	+
60300	Dineutus sp	+
60900	Peltodytes sp	+
68130	Helichus sp	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
72700	Anopheles sp	+
74100	Simulium sp	+
77120	Ablabesmyia mallochi	+
77355	Clinotanypus pinguis	+
78655	Procladius (Holotanypus) sp	+
82885	Cryptotendipes pseudotener	+
83840	Microtendipes pedellus group	+
84470	Polypedilum (P.) illinoense	+
84800	Tribelos jucundum	+
85615	Rheotanytarsus pellucidus	+
85800	Tanytarsus sp	+
87510	Neoplasta sp	+
96002	Helisoma anceps anceps	+
97601	Corbicula fluminea	+

Station: W03P33 ROCKCAMP CREEK S OF MINERAL @ ST. RT. 356 0:00 7/28/16

Rivercode: 09-564-000 River Mile: 1.53

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
51	12	7	1	51		7		Marginally Good	NORMAL

	Taxa	Quant/Qual
03360	Plumatella sp	+
03600	Oligochaeta	+
06201	Hyalella sp	+
07701	Cambaridae	+
08601	Hydrachnidia	+
11150	Labiobaetis propinquus	+
11200	Callibaetis sp	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
18750	Hexagenia limbata	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
22300	Argia sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26700	Macromia sp	+
33100	Leuctra sp	+
45100	Palmacorixa sp	+
45400	Trichocorixa sp	+
45900	Notonecta sp	+
47600	Sialis sp	+
51600	Polycentropus group	+
55300	Ptilostomis sp	+
60300	Dineutus sp	+
60900	Peltodytes sp	+
65800	Berosus sp	+
67700	Paracymus sp	+
67800	Tropisternus sp	+
68130	Helichus sp	+
68702	Dubiraphia bivittata	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77140	Ablabesmyia peleensis	+
77355	Clinotanypus pinguis	+
78450	Nilotanypus fimbriatus	+
78655	Procladius (Holotanypus) sp	+
82820	Cryptochironomus sp	+
82885	Cryptotendipes pseudotener	+
84470	Polypedilum (P.) illinoense	+
84800	Tribelos jucundum	+
86100	Chrysops sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+

Station: W03W50 COAL RUN SE OF MINERAL @ ST. RT. 681 0:00 7/12/16

Rivercode: 09-565-000 River Mile: 0.05

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
14	5	3	0	14		3		Fair	INTERSTITI

	Taxa	Quant/Qual
07701	Cambaridae	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
27500	Somatochlora sp	+
57400	Neophylax sp	+
61100	Acilius sp	+
63300	Hydroporini	+
72340	Dixella sp	+
72700	Anopheles sp	+
81712	Psectrocladius (P.) psilopterus group	+
84210	Paratendipes albimanus or P. duplicatus	+
95100	Physella sp	+

Station: 301579 PINE RUN NW OF MINERAL @ MOUTH 0:00 7/28/16

Rivercode: 09-566-000 River Mile: 0.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
32	8	5	0	32		5		Fair	NORMAL

	Taxa	Quant/Qual
01900	Nemertea	+
02600	Nematomorpha	+
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
13590	Maccaffertium vicarium	+
17200	Caenis sp	+
21200	Calopteryx sp	+
23804	Basiaeschna janata	+
24501	Gomphidae	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50301	Chimarra aterrima	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
55300	Ptilostomis sp	+
63300	Hydroporini	+
67800	Tropisternus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
71100	Hexatoma sp	+
71900	Tipula sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
82885	Cryptotendipes pseudotener	+
84470	Polypedilum (P.) illinoense	+
84540	Polypedilum (Tripodura) scalaenum group	+
85800	Tanytarsus sp	+
85801	Tanytarsus sp 1	+
94400	Fossaria sp	+

Station: W03P41 GRASS RUN N OF MINERAL @ ST. RT. 356 0:00 7/18/16

Rivercode: 09-567-000 River Mile: 0.04

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
33	7	4	1	33		4		Fair	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
07701	Cambaridae	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21001	Calopterygidae	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
27500	Somatochlora sp	+
44501	Corixidae	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
52200	Cheumatopsyche sp	+
57900	Pycnopsyche sp	+
60300	Dineutus sp	+
63300	Hydroporini	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71700	Pilaria sp	+
71900	Tipula sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
79400	Zavrelimyia (Z.) sp	+
84470	Polypedilum (P.) illinoense	+
84750	Stictochironomus sp	+
95100	Physella sp	+
96002	Helisoma anceps anceps	+
98600	Sphaerium sp	+

Station: 203966 SANDY RUN UPST. LAKE HOPE @ KING HOLLOW TRAIL 0:00 7/7/16

Rivercode: 09-568-000 River Mile: 2.70

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
35	13	8	2	35		8		Good	NORMAL

	Taxa	Quant/Qual
07701	Cambaridae	+
11018	Acerpenna macdunnoughi	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
23600	Aeshna sp	+
24900	Gomphus Complex	+
26100	Cordulegaster sp	+
27500	Somatochlora sp	+
33100	Leuctra sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
51400	Nyctiophylax sp	+
51500	Phylocentropus sp	+
52200	Cheumatopsyche sp	+
52500	Hydropsyche sp	+
56650	Goera sp.	+
57900	Pycnopsyche sp	+
63300	Hydroporini	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71900	Tipula sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77750	Thienemannimyia sp	+
78655	Procladius (Holotanypus) sp	+
79832	Monodiamesa depectinata	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
82820	Cryptochironomus sp	+
85625	Rheotanytarsus sp	+
85800	Tanytarsus sp	+

Station: 303689 LITTLE SANDY RUN AT ST. RT. 278 SOUTH OF LAKE HOPE 0:00 7/27/16

Rivercode: 09-569-000 River Mile: 0.40

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
27	2	0	0	27		0		Poor	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04637	Placobdella phalera	+
05800	Caecidotea sp	+
06201	Hyalella sp	+
08601	Hydrachnidia	+
11200	Callibaetis sp	+
17200	Caenis sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
27307	Epitheca (Epicordulia) princeps	+
42700	Belostoma sp	+
43300	Ranatra sp	+
44501	Corixidae	+
45900	Notonecta sp	+
48220	Chauliodes rastricornis	+
60300	Dineutus sp	+
60900	Peltodytes sp	+
62700	Desmopachria sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
77140	Ablabesmyia peleensis	+
77355	Clinotanypus pinguis	+
77700	Guttipelopia guttipennis	+
78130	Labrundinia neopilosella	+
78680	Procladius (Psilotanypus) bellus	+
83158	Endochironomus nigricans	+
94603	Pseudosuccinea columella	+

Station: W03K40 BRUSHY CREEK 2.7 MI. N OF CREOLA @ GRAVEL LANE OFF S.R. 93 0:00 7/26/16

Rivercode: 09-571-000 River Mile: 6.87

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
40	15	14	3	40		14		Good	LOW

	Taxa	Quant/Qual
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
08601	Hydrachnidia	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
12200	Isonychia sp	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
17200	Caenis sp	+
21200	Calopteryx sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26100	Cordulegaster sp	+
27500	Somatochlora sp	+
33100	Leuctra sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50300	Chimarra sp	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
69210	Optioservus ovalis	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
78655	Procladius (Holotanypus) sp	+
79400	Zavrelimyia (Z.) sp	+
82300	Xylotopus par	+
83840	Microtendipes pedellus group	+
84440	Polypedilum (Uresipedilum) aviceps	+
84800	Tribelos jucundum	+
85625	Rheotanytarsus sp	+
85800	Tanytarsus sp	+
95100	Physella sp	+

Station: W03K39 BRUSHY CREEK @ SR 328 NEAR MOUTH 0:00 8/22/16

Rivercode: 09-571-000 River Mile: 0.36

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
33	15	13	0	50	697	14	38	N/A	0.50 NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	4
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	1+
11670	Procloeon viridoculare	+
13400	Stenacron sp	32+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	145+
17200	Caenis sp	4+
17600	Baetisca sp	1+
21200	Calopteryx sp	5+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
25600	Stylurus sp	+
26700	Macromia sp	+
28705	Pachydiplax longipennis	+
47600	Sialis sp	3+
48620	Nigronia serricornis	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	7+
52200	Cheumatopsyche sp	+
57900	Pycnopsyche sp	2+
59720	Triaenodes ignitus	+
59730	Triaenodes melaca	+
60300	Dineutus sp	+
60400	Gyrinus sp	+
63300	Hydroporini	+
68130	Helichus sp	1+
71100	Hexatoma sp	+
77115	Ablabesmyia janta	11
77120	Ablabesmyia mallochi	56+
77500	Conchapelopia sp	23
78450	Nilotanypus fimbriatus	6
78655	Procladius (Holotanypus) sp	+
79085	Telopelopia okoboji	5
80358	Corynoneura macula	19
82121	Thienemanniella lobapodema	2
83840	Microtendipes pedellus group	17
83900	Nilothauma sp	6
84210	Paratendipes albimanus or P. duplicatus	62
84460	Polypedilum (P.) fallax group	73
84470	Polypedilum (P.) illinoense	17
84700	Stenochironomus sp	+
84800	Tribelos jucundum	23
85800	Tanytarsus sp	57
85801	Tanytarsus sp 1	102
85821	Tanytarsus glabrescens group sp 7	11
86100	Chrysops sp	1+
87540	Hemerodromia sp	1

Station: W03K42 SIVERLY CREEK N OF CREOLA @ LANE NEAR MOUTH 0:00 7/26/16

Rivercode: 09-571-002 River Mile: 0.30

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
48	15	14	2	48		14		Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
14950	small Leptophlebiidae	+
21200	Calopteryx sp	+
22300	Argia sp	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26100	Cordulegaster sp	+
27340	Helocordulia uhleri	+
27500	Somatochlora sp	+
33100	Leuctra sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
63300	Hydroporini	+
63900	Laccophilus sp	+
68075	Psephenus herricki	+
68130	Helichus sp	+
68201	Scirtidae	+
68601	Ancyronyx variegatus	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
72340	Dixella sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
78101	Labrundinia becki	+
80204	Brillia flavifrons group	+
82300	Xylotopus par	+
83840	Microtendipes pedellus group	+
84440	Polypedilum (Uresipedilum) aviceps	+
84450	Polypedilum (Uresipedilum) flavum	+
84800	Tribelos jucundum	+
85625	Rheotanytarsus sp	+
85800	Tanytarsus sp	+
95100	Physella sp	+

Station: W03W58 TWOMILE RUN 4.8 MI. N OF ZALESKI @ ROAD NEAR MOUTH 0:00 8/4/16

Rivercode: 09-573-000 River Mile: 0.16

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
55	18	15	3	55		15		Very Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
07820	Cambarus (Cambarus) bartonii cavatus	+
11018	Acerpenna macdunnoughi	+
11120	Baetis flavistriga	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
13521	Stenonema femoratum	+
13590	Maccaffertium vicarium	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
25410	Progomphus obscurus	+
26100	Cordulegaster sp	+
27001	Corduliidae	+
33100	Leuctra sp	+
34130	Acroneuria frisoni	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50301	Chimarra aterrima	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
63300	Hydroporini	+
68130	Helichus sp	+
68201	Scirtidae	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
77800	Helopelopia sp	+
78401	Natarsia species A (sensu Roback, 1978)	+
80204	Brillia flavifrons group	+
81650	Parametriocnemus sp	+
81825	Rheocricotopus (Psilocricotopus) robacki	+
82300	Xylotopus par	+
84440	Polypedilum (Uresipedilum) aviceps	+
84520	Polypedilum (Tripodura) halterale group	+
84612	Saetheria tylus	+
84700	Stenochironomus sp	+
85625	Rheotanytarsus sp	+
85800	Tanytarsus sp	+
86100	Chrysops sp	+
87540	Hemerodromia sp	+

Station: W03W37 E. BR. RACCOON CREEK NE OF COONVILLE @ SANNER RD. 0:00 7/25/16

Rivercode: 09-574-000 River Mile: 6.64

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
12	2	1	0	12		1		Poor	NORMAL

	Taxa	Quant/Qual
07701	Cambaridae	+
08601	Hydrachnidia	+
21001	Calopterygidae	+
22001	Coenagrionidae	+
47600	Sialis sp	+
52200	Cheumatopsyche sp	+
59700	Triaenodes sp	+
68130	Helichus sp	+
78655	Procladius (Holotanypus) sp	+
78700	Psectrotanypus sp	+
82730	Chironomus (C.) decorus group	+
84470	Polypedilum (P.) illinoense	+

Station: W03K17 E. BR. RACCOON CREEK ADJ. ST. RT. 56/328 0:00 7/25/16

Rivercode: 09-574-000 River Mile: 2.10

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
28	11	8	1	28		8		Marginally Good	NORMAL

	Taxa	Quant/Qual
07701	Cambaridae	+
08601	Hydrachnidia	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
17200	Caenis sp	+
21200	Calopteryx sp	+
24900	Gomphus Complex	+
26700	Macromia sp	+
27400	Neurocordulia sp	+
47600	Sialis sp	+
48200	Chauliodes sp	+
50301	Chimarra aterrima	+
51400	Nyctiophylax sp	+
52200	Cheumatopsyche sp	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
68130	Helichus sp	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71900	Tipula sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
79400	Zavrelimyia (Z.) sp	+
84450	Polypedilum (Uresipedilum) flavum	+
84800	Tribelos jucundum	+

Station: W03W36 W. BR. RACCOON CREEK @ ILESBORO-CEDAR FALLS RD 0:00 7/25/16

Rivercode: 09-575-000 River Mile: 5.68

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
36	15	13	1	36		13		Good	NORMAL

	Taxa	Quant/Qual
07800	Cambarus sp	+
11018	Acerpenna macdunnoughi	+
11120	Baetis flavistriga	+
11130	Baetis intercalaris	+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
12200	Isonychia sp	+
13521	Stenonema femoratum	+
21200	Calopteryx sp	+
22300	Argia sp	+
23600	Aeshna sp	+
23909	Boyeria vinosa	+
26100	Cordulegaster sp	+
27400	Neurocordulia sp	+
27500	Somatochlora sp	+
33100	Leuctra sp	+
47600	Sialis sp	+
50301	Chimarra aterrima	+
51400	Nyctiophylax sp	+
52430	Ceratopsyche morosa group	+
52530	Hydropsyche depravata group	+
57900	Pycnopsyche sp	+
59730	Triaenodes melaca	+
67100	Hydrobius sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
71800	Pseudolimnophila sp	+
72340	Dixella sp	+
72700	Anopheles sp	+
74100	Simulium sp	+
74501	Ceratopogonidae	+
77120	Ablabesmyia mallochi	+
84800	Tribelos jucundum	+

Station: W03W43 W. BR. RACCOON CREEK NEAR MOUTH @ ST. RT. 328 0:00 8/17/16

Rivercode: 09-575-000 River Mile: 0.15

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
37	12	10	0	62	521	12	46	N/A	1.00 NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	6+
08260	Orconectes (Crokerinus) sanbornii sanbornii	1+
11130	Baetis intercalaris	1
11200	Callibaetis sp	+
11250	Neocloeon sp	+
11651	Procloeon sp (w/o hindwing pads)	6+
11670	Procloeon viridoculare	+
12200	Isonychia sp	1
13400	Stenacron sp	11+
13521	Stenonema femoratum	5+
14950	small Leptophlebiidae	12
16700	Tricorythodes sp	5
17200	Caenis sp	8+
17600	Baetisca sp	+
21200	Calopteryx sp	1+
22001	Coenagrionidae	+
22300	Argia sp	7
23909	Boyeria vinosa	+
26100	Cordulegaster sp	+
26700	Macromia sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
50315	Chimarra obscura	+
51001	Polycentropodidae	1
52200	Cheumatopsyche sp	4+
57900	Pycnopsyche sp	1+
59730	Triaenodes melaca	+
60400	Gyrinus sp	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	1+
68901	Macronychus glabratus	1+
69400	Stenelmis sp	+
71100	Hexatoma sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	8+
77115	Ablabesmyia janta	27
77120	Ablabesmyia mallochi	22
77800	Helopelopia sp	6+
80370	Corynoneura lobata	1
82121	Thienemanniella lobapodema	1
82300	Xylotopus par	+
82730	Chironomus (C.) decorus group	11
83000	Dicrotendipes sp	6
83158	Endochironomus nigricans	16+
83300	Glyptotendipes (G.) sp	33
83840	Microtendipes pedellus group	6
83900	Nilothauma sp	16
84210	Paratendipes albimanus or P. duplicatus	11
84450	Polypedilum (Uresipedilum) flavum	6+
84460	Polypedilum (P.) fallax group	44+
84540	Polypedilum (Tripodura) scalaenum group	27
84800	Tribelos jucundum	27
85500	Paratanytarsus sp	11+
85625	Rheotanytarsus sp	6
85800	Tanytarsus sp	110
85801	Tanytarsus sp 1	22
85821	Tanytarsus glabrescens group sp 7	27
86100	Chrysops sp	+
87701	Syrphidae	+
94400	Fossaria sp	1
95100	Physella sp	3
96900	Ferrissia sp	1

Station: W03P35 HONEY FORK 1 MI W OF NEW PLYMOUTH @ MOUTH 0:00 7/18/16

Rivercode: 09-576-000 River Mile: 0.01

Qual Taxa	Qual EPT	Qual Sensitive	Coldwater	Total Taxa	Total Number	Sensitive Taxa	ICI	Narrative	Flow
44	15	13	0	44		13		Good	NORMAL

	Taxa	Quant/Qual
03600	Oligochaeta	+
04686	Placobdella papillifera	+
06201	Hyalella sp	+
08260	Orconectes (Crokerinus) sanbornii sanbornii	+
11018	Acerpenna macdunnoughi	+
11150	Labiobaetis propinquus	+
11250	Neocloeon sp	+
11650	Procloeon sp (w/ hindwing pads)	+
11651	Procloeon sp (w/o hindwing pads)	+
11670	Procloeon viridoculare	+
13400	Stenacron sp	+
13521	Stenonema femoratum	+
14950	small Leptophlebiidae	+
17200	Caenis sp	+
21200	Calopteryx sp	+
22001	Coenagrionidae	+
23804	Basiaeschna janata	+
23909	Boyeria vinosa	+
24900	Gomphus Complex	+
26700	Macromia sp	+
27500	Somatochlora sp	+
47600	Sialis sp	+
48620	Nigronia serricornis	+
51400	Nyctiophylax sp	+
51600	Polycentropus group	+
57900	Pycnopsyche sp	+
59700	Triaenodes sp	+
59730	Triaenodes melaca	+
60400	Gyrinus sp	+
63300	Hydroporini	+
68130	Helichus sp	+
68708	Dubiraphia vittata group	+
68901	Macronychus glabratus	+
72340	Dixella sp	+
72700	Anopheles sp	+
74501	Ceratopogonidae	+
77750	Thienemannimyia sp	+
78655	Procladius (Holotanypus) sp	+
82820	Cryptochironomus sp	+
83670	Lipiniella sp	+
84700	Stenochironomus sp	+
84800	Tribelos jucundum	+
85800	Tanytarsus sp	+
95100	Physella sp	+

Appendix D — Macroinvertebrate ICI Scores and Metrics

Appendix Table C. Invertebrate Community Index metrics for stations sampled in the Raccoon Creek survey, 2016.

RM	Drainage Area (sq mi)	Number of Taxa				Percent Composition					QUAL EPT	Eco-region	ICI
		Total	Mayfly	Caddisfly	Dipteran	Mayfly	Caddisfly	Tany-tarsini	Other Dipt/NI	Tolerant Organisms			
09-500-000 RACCOON CREEK													
111.38	42.8	39 (6)	5 (2)	4 (6)	23 (6)	31.8 (6)	2.0 (2)	35.1 (6)	27.3 (6)	3.3 (6)	11 (4)	WAP	50
104.63	56.4	40 (6)	3 (2)	6 (6)	21 (6)	8.3 (2)	10.3 (4)	43.3 (6)	36.7 (4)	7.5 (4)	14 (6)	WAP	46
99.60	98.0	27 (4)	1 (0)	3 (4)	16 (4)	0.7 (2)	6.3 (2)	68.4 (6)	23.9 (6)	5.1 (6)	22 (6)	WAP	40
98.34	100.0	33 (4)	5 (2)	4 (4)	17 (4)	3.2 (2)	4.4 (2)	68.0 (6)	24.1 (6)	0.9 (6)	15 (6)	WAP	42
89.98	136.0	33 (4)	3 (2)	2 (2)	19 (6)	3.9 (2)	1.2 (2)	29.3 (4)	64.1 (0)	33.0 (0)	18 (6)	WAP	28
84.08	183.0	32 (4)	6 (4)	4 (4)	15 (4)	5.8 (2)	5.7 (2)	48.2 (6)	38.8 (4)	5.4 (4)	15 (4)	WAP	38
80.62	200.0	34 (4)	5 (2)	6 (6)	12 (4)	1.3 (2)	4.9 (2)	50.9 (6)	41.2 (2)	3.0 (6)	16 (6)	WAP	40
72.22	223.0	20 (2)	4 (2)	4 (4)	8 (2)	20.2 (4)	21.2 (4)	23.2 (4)	32.2 (4)	0.0 (6)	20 (6)	WAP	38
63.80	296.0	30 (4)	6 (4)	5 (6)	15 (4)	21.0 (4)	2.8 (2)	24.0 (4)	43.7 (2)	4.7 (4)	20 (6)	WAP	40
55.48	322.0	31 (4)	6 (4)	7 (6)	9 (2)	32.6 (6)	10.2 (2)	6.0 (2)	43.8 (2)	2.3 (6)	17 (6)	WAP	40
50.10	336.0	21 (2)	4 (2)	4 (4)	7 (2)	36.2 (6)	7.5 (2)	27.9 (4)	20.6 (6)	0.4 (6)	19 (6)	WAP	40
40.01	381.0	40 (6)	6 (4)	7 (6)	20 (6)	12.3 (2)	17.8 (4)	26.2 (4)	38.5 (2)	8.5 (2)	19 (6)	WAP	42
35.61	542.0	30 (4)	4 (2)	7 (6)	10 (4)	41.9 (6)	35.7 (6)	12.8 (2)	7.9 (6)	1.1 (6)	22 (6)	WAP	48
10.20	648.0	35 (6)	6 (4)	7 (6)	13 (4)	41.6 (6)	43.7 (6)	4.3 (2)	6.6 (6)	0.9 (6)	29 (6)	WAP	52
09-510-000 LITTLE RACCOON CREEK													
27.90	48.0	38 (6)	5 (2)	6 (6)	16 (4)	23.3 (4)	3.6 (2)	18.7 (4)	52.4 (2)	5.9 (6)	9 (4)	WAP	40
24.55	62.5	29 (4)	4 (2)	6 (6)	15 (4)	54.8 (6)	29.0 (6)	1.1 (2)	7.5 (6)	1.1 (6)	14 (6)	WAP	48
18.45	87.0	35 (4)	6 (4)	7 (6)	17 (4)	6.3 (2)	18.3 (6)	9.1 (2)	58.5 (2)	7.2 (4)	11 (4)	WAP	38
12.71	99.0	37 (4)	5 (2)	6 (6)	17 (4)	28.4 (4)	2.9 (2)	18.0 (4)	42.4 (4)	4.9 (6)	16 (6)	WAP	42
11.00	129.0	41 (6)	7 (4)	5 (6)	21 (6)	26.5 (4)	12.1 (4)	17.9 (4)	41.8 (4)	12.5 (2)	14 (4)	WAP	44
1.17	154.0	39 (6)	8 (4)	7 (6)	14 (4)	50.0 (6)	13.1 (4)	18.7 (4)	12.6 (6)	2.7 (6)	22 (6)	WAP	52
09-514-000 DICKASON RUN													
0.11	26.9	33 (4)	2 (0)	3 (6)	22 (6)	2.8 (2)	2.1 (2)	51.5 (6)	40.2 (4)	6.4 (6)	14 (6)	WAP	42
09-530-000 ELK FORK													
8.55	44.4	32 (4)	6 (4)	3 (4)	11 (2)	4.4 (2)	40.0 (6)	23.2 (4)	30.9 (4)	2.7 (6)	19 (6)	WAP	42
09-563-000 HEWETT FORK													
4.31	28.1	23 (2)	3 (2)	3 (6)	12 (2)	7.2 (2)	20.9 (6)	50.1 (6)	20.7 (6)	4.1 (6)	18 (6)	WAP	44
09-571-000 BRUSHY FORK													
0.36	33.4	29 (4)	5 (4)	2 (4)	18 (4)	26.3 (4)	1.3 (2)	24.4 (4)	46.8 (2)	13.5 (4)	15 (6)	WAP	38
09-575-000 WEST BRANCH RACCOON CREEK													
0.15	22.7	42 (6)	8 (6)	3 (6)	22 (6)	9.4 (2)	1.2 (2)	33.8 (6)	53.7 (2)	12.5 (4)	12 (6)	WAP	46

Appendix E — Fish Species and Abundance

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-09-01**
River Mile:	**111.4**	Location:	RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328				
Time Fished:	2589 sec	Drainage:	42.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	14	21.00	6.86	0.31	8.85	14.57
Redfin Pickerel		P	M	P	9	13.50	4.41	0.36	10.42	26.67
Golden Redhorse		I	S	M	3	4.50	1.47	0.19	5.56	42.67
Northern Hog Sucker		I	S	M	1	1.50	0.49	0.02	0.52	12.00
Creek Chub		G	N	T	8	12.00	3.92	0.29	8.43	24.29
Redfin Shiner		I	N	N	23	34.50	11.27	0.07	1.91	1.91
Striped Shiner		I	S	N	47	70.50	23.04	0.31	9.07	4.44
Bluntnose Minnow		O	C	T	29	43.50	14.22	0.05	1.44	1.14
Yellow Bullhead		I	C	T	2	3.00	0.98	0.03	0.95	11.00
Rock Bass		C	C	N	4	6.00	1.96	0.09	2.65	15.25
Spotted Bass		C	C	N	1	1.50	0.49	0.02	0.43	10.00
Largemouth Bass		C	C	N	3	4.50	1.47	0.24	6.94	53.33
Warmouth Sunfish		C	C	N	1	1.50	0.49	0.06	1.87	43.00
Green Sunfish		I	C	T	18	27.00	8.82	0.56	16.09	20.59
Longear Sunfish		I	C	M	27	40.50	13.24	0.66	19.14	16.33
Hybrid x Sunfish				N	2	3.00	0.98	0.16	4.56	52.50
Blackside Darter		I	S	N	1	1.50	0.49	0.01	0.35	8.00
Johnny Darter		I	C	N	5	7.50	2.45	0.01	0.39	1.80
Fantail Darter		I	C	N	6	9.00	2.94	0.02	0.43	1.67
			Data Totals:		204	306.00		3.46		
			Number of Species:		19					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-11**
River Mile:	**111.4**	Location:	RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328				
Time Fished:	2328 sec	Drainage:	42.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	5	7.50	2.27	0.04	0.82	5.60
Redfin Pickerel		P	M	P	6	9.00	2.73	0.17	3.39	19.17
Golden Redhorse		I	S	M	12	18.00	5.45	0.95	18.56	52.50
Northern Hog Sucker		I	S	M	4	6.00	1.82	0.09	1.77	15.00
White Sucker		O	S	T	3	4.50	1.36	0.54	10.67	120.67
Spotted Sucker		I	S	N	1	1.50	0.45	0.05	0.94	32.00
Creek Chub		G	N	T	13	19.50	5.91	0.65	12.73	33.23
Striped Shiner		I	S	N	23	34.50	10.45	0.57	11.14	16.43
Bluntnose Minnow		O	C	T	80	120.00	36.36	0.26	5.01	2.13
Yellow Bullhead		I	C	T	1	1.50	0.45	0.23	4.42	150.00
Rock Bass		C	C	N	6	9.00	2.73	0.37	7.31	41.33
Spotted Bass		C	C	N	2	3.00	0.91	0.09	1.71	29.00
Green Sunfish		I	C	T	3	4.50	1.36	0.09	1.71	19.33
Bluegill Sunfish		I	C	P	1	1.50	0.45	0.04	0.77	26.00
Longear Sunfish		I	C	M	33	49.50	15.00	0.81	15.91	16.36
Hybrid x Sunfish				N	3	4.50	1.36	0.11	2.18	24.67
Dusky Darter		I	S	M	1	1.50	0.45	0.02	0.35	12.00
Johnny Darter		I	C	N	16	24.00	7.27	0.02	0.38	0.81
Fantail Darter		I	C	N	7	10.50	3.18	0.01	0.24	1.14
			Data Totals:		220	330.00		5.09		
			Number of Species:		19					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-09-15**
River Mile:	**104.6**	Location:	RACCOON CREEK DST. MITCHELL HOLLOW @ ST. RT. 328				
Time Fished:	1486 sec	Drainage:	56.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.37	0.02	0.27	12.00
Redfin Pickerel		P	M	P	5	7.50	1.83	0.13	1.97	17.60
Golden Redhorse		I	S	M	7	10.50	2.56	1.22	18.15	115.86
Northern Hog Sucker		I	S	M	1	1.50	0.37	0.50	7.38	330.00
Spotted Sucker		I	S	N	2	3.00	0.73	2.12	31.55	705.00
Creek Chub		G	N	T	25	37.50	9.16	0.36	5.37	9.60
Striped Shiner		I	S	N	91	136.50	33.33	0.71	10.56	5.19
Silverjaw Minnow		I	M	N	2	3.00	0.73	0.01	0.13	3.00
Bluntnose Minnow		O	C	T	63	94.50	23.08	0.21	3.13	2.22
Yellow Bullhead		I	C	T	2	3.00	0.73	0.13	1.92	43.00
Rock Bass		C	C	N	1	1.50	0.37	0.06	0.94	42.00
Spotted Bass		C	C	N	2	3.00	0.73	0.06	0.90	20.00
Largemouth Bass		C	C	N	2	3.00	0.73	0.17	2.46	55.00
Warmouth Sunfish		C	C	N	1	1.50	0.37	0.08	1.16	52.00
Green Sunfish		I	C	T	18	27.00	6.59	0.32	4.74	11.78
Bluegill Sunfish		I	C	P	1	1.50	0.37	0.03	0.45	20.00
Longear Sunfish		I	C	M	28	42.00	10.26	0.54	8.01	12.79
Redear Sunfish		I	C	N	1	1.50	0.37	0.03	0.40	18.00
Johnny Darter		I	C	N	9	13.50	3.30	0.02	0.27	1.33
Fantail Darter		I	C	N	11	16.50	4.03	0.02	0.22	0.91
			Data Totals:		273	409.50		6.70		
			Number of Species:		20					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**	Sample Date:	**2016-06-29**
River Mile:	**104.6**	Location:	RACCOON CREEK DST. MITCHELL HOLLOW @ ST. RT. 328		
Time Fished:	1800 sec	Drainage:	56.4 sq mi	Depth:	Data Source:
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow: N	Sampler Type: D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	3	4.50	2.31	0.03	0.62	5.67
Northern Hog Sucker		I	S	M	2	3.00	1.54	0.06	1.46	20.00
White Sucker		O	S	T	3	4.50	2.31	0.33	8.02	73.00
Creek Chub		G	N	T	18	27.00	13.85	0.51	12.45	18.89
Striped Shiner		I	S	N	25	37.50	19.23	0.09	2.20	2.40
Silverjaw Minnow		I	M	N	2	3.00	1.54	0.01	0.18	2.50
Bluntnose Minnow		O	C	T	14	21.00	10.77	0.05	1.17	2.29
Yellow Bullhead		I	C	T	8	12.00	6.15	1.50	36.62	125.00
Rock Bass		C	C	N	5	7.50	3.85	0.64	15.56	85.00
Warmouth Sunfish		C	C	N	3	4.50	2.31	0.07	1.72	15.67
Green Sunfish		I	C	T	20	30.00	15.38	0.38	9.34	12.75
Longear Sunfish		I	C	M	15	22.50	11.54	0.38	9.15	16.67
Dusky Darter		I	S	M	3	4.50	2.31	0.01	0.29	2.67
Blackside Darter		I	S	N	5	7.50	3.85	0.03	0.70	3.80
Johnny Darter		I	C	N	4	6.00	3.08	0.02	0.51	3.50
			Data Totals:		130	195.00		4.10		
			Number of Species:		15					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-23**
River Mile:	**99.6**	Location:	RACCOON CREEK W OF ZALESKI @ ST. RT. 677				
Time Fished:	2307 sec	Drainage:	98.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.35 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	8.57	2.17	0.03	0.09	4.00
Redfin Pickerel		P	M	P	4	11.43	2.90	0.14	0.36	12.00
Silver Redhorse		I	S	M	1	2.86	0.72	1.71	4.46	600.00
Golden Redhorse		I	S	M	18	51.43	13.04	4.51	11.73	87.61
Northern Hog Sucker		I	S	M	11	31.43	7.97	1.56	4.06	49.64
White Sucker		O	S	T	2	5.71	1.45	1.29	3.35	225.00
Spotted Sucker		I	S	N	2	5.71	1.45	2.71	7.07	475.00
Common Carp		O	M	T	2	5.71	1.45	11.64	30.32	2037.50
Bluntnose Minnow		O	C	T	1	2.86	0.72	0.00	0.01	1.00
Yellow Bullhead		I	C	T	1	2.86	0.72	0.93	2.42	325.00
Rock Bass		C	C	N	2	5.71	1.45	0.60	1.56	105.00
Spotted Bass		C	C	N	8	22.86	5.80	2.09	5.45	91.63
Largemouth Bass		C	C	N	8	22.86	5.80	5.34	13.90	233.50
Warmouth Sunfish		C	C	N	1	2.86	0.72	0.14	0.36	48.00
Green Sunfish		I	C	T	4	11.43	2.90	0.37	0.97	32.50
Bluegill Sunfish		I	C	P	14	40.00	10.14	2.27	5.91	56.71
Longear Sunfish		I	C	M	35	100.00	25.36	2.14	5.57	21.37
Hybrid x Sunfish				N	4	11.43	2.90	0.75	1.96	66.00
Dusky Darter		I	S	M	5	14.29	3.62	0.09	0.22	6.00
Blackside Darter		I	S	N	4	11.43	2.90	0.03	0.09	3.00
Logperch		I	S	M	1	2.86	0.72	0.03	0.07	10.00
Johnny Darter		I	C	N	5	14.29	3.62	0.02	0.04	1.20
Fantail Darter		I	C	N	2	5.71	1.45	0.01	0.01	1.00
			Data Totals:		138	394.29		38.40		
			Number of Species:		23					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-15**
River Mile:	**98.3**	Location:	RACCOON CREEKSW OF ZALESKI @ FOREST ROAD #3				
Time Fished:	3684 sec	Drainage:	100.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	6	9.00	2.09	0.08	1.46	9.33
Redfin Pickerel		P	M	P	8	12.00	2.79	0.21	3.56	17.13
Golden Redhorse		I	S	M	6	9.00	2.09	1.22	21.07	135.00
Northern Hog Sucker		I	S	M	12	18.00	4.18	0.45	7.86	25.17
Spotted Sucker		I	S	N	2	3.00	0.70	0.01	0.16	3.00
Creek Chub		G	N	T	38	57.00	13.24	1.02	17.64	17.84
Striped Shiner		I	S	N	112	168.00	39.02	0.82	14.20	4.88
Bluntnose Minnow		O	C	T	32	48.00	11.15	0.17	2.91	3.50
Central Stoneroller		H	N	N	2	3.00	0.70	0.02	0.42	8.00
Yellow Bullhead		I	C	T	2	3.00	0.70	0.15	2.60	50.00
Rock Bass		C	C	N	4	6.00	1.39	0.21	3.59	34.50
Spotted Bass		C	C	N	6	9.00	2.09	0.31	5.41	34.67
Largemouth Bass		C	C	N	1	1.50	0.35	0.47	8.12	312.00
Green Sunfish		I	C	T	1	1.50	0.35	0.02	0.26	10.00
Bluegill Sunfish		I	C	P	1	1.50	0.35	0.06	1.09	42.00
Longear Sunfish		I	C	M	18	27.00	6.27	0.44	7.67	16.39
Dusky Darter		I	S	M	2	3.00	0.70	0.05	0.83	16.00
Logperch		I	S	M	1	1.50	0.35	0.02	0.26	10.00
Johnny Darter		I	C	N	10	15.00	3.48	0.03	0.49	1.90
Banded Darter		I	S	I	1	1.50	0.35	0.00	0.05	2.00
Fantail Darter		I	C	N	22	33.00	7.67	0.02	0.34	0.59
			Data Totals:		287	430.50		5.77		
			Number of Species:		21					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-07-14**
River Mile:	**98.3**	Location:	RACCOON CREEKSW OF ZALESKI @ FOREST ROAD #3				
Time Fished:	2702 sec	Drainage:	100.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	4.50	1.21	0.03	0.38	6.67
Redfin Pickerel		P	M	P	3	4.50	1.21	0.04	0.49	8.67
Golden Redhorse		I	S	M	9	13.50	3.64	2.11	26.35	156.00
Northern Hog Sucker		I	S	M	16	24.00	6.48	0.62	7.70	25.63
White Sucker		O	S	T	1	1.50	0.40	0.56	7.04	375.00
Creek Chub		G	N	T	24	36.00	9.72	0.56	6.94	15.42
Redfin Shiner		I	N	N	1	1.50	0.40	0.00	0.04	2.00
Striped Shiner		I	S	N	93	139.50	37.65	0.83	10.40	5.96
Bluntnose Minnow		O	C	T	24	36.00	9.72	0.09	1.09	2.42
Yellow Bullhead		I	C	T	3	4.50	1.21	0.83	10.38	184.33
Rock Bass		C	C	N	5	7.50	2.02	0.14	1.69	18.00
Spotted Bass		C	C	N	3	4.50	1.21	0.04	0.45	8.00
Largemouth Bass		C	C	N	2	3.00	0.81	0.91	11.36	302.50
Warmouth Sunfish		C	C	N	3	4.50	1.21	0.14	1.73	30.67
Green Sunfish		I	C	T	1	1.50	0.40	0.01	0.08	4.00
Bluegill Sunfish		I	C	P	1	1.50	0.40	0.11	1.31	70.00
Longear Sunfish		I	C	M	26	39.00	10.53	0.93	11.64	23.85
Dusky Darter		I	S	M	2	3.00	0.81	0.03	0.38	10.00
Blackside Darter		I	S	N	2	3.00	0.81	0.01	0.11	3.00
Johnny Darter		I	C	N	19	28.50	7.69	0.03	0.36	1.00
Fantail Darter		I	C	N	6	9.00	2.43	0.01	0.11	1.00
			Data Totals:		247	370.50		7.99		
			Number of Species:		21					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-09-01**
River Mile:	**90.0**	Location:	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.				
Time Fished:	2962 sec	Drainage:	136.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	2	3.00	0.42	0.02	0.16	8.00
Redfin Pickerel		P	M	P	5	7.50	1.04	0.15	0.97	19.60
Golden Redhorse		I	S	M	2	3.00	0.42	0.60	3.95	200.00
Northern Hog Sucker		I	S	M	22	33.00	4.58	2.04	13.46	61.86
Creek Chub		G	N	T	9	13.50	1.88	0.06	0.38	4.22
Redfin Shiner		I	N	N	1	1.50	0.21	0.00	0.01	1.00
Striped Shiner		I	S	N	241	361.50	50.21	1.60	10.57	4.44
Bluntnose Minnow		O	C	T	77	115.50	16.04	0.28	1.83	2.41
Central Stoneroller		H	N	N	11	16.50	2.29	0.14	0.95	8.73
Yellow Bullhead		I	C	T	6	9.00	1.25	1.59	10.48	176.67
Brook Silverside		I	M	M	2	3.00	0.42	0.00	0.03	1.50
Rock Bass		C	C	N	12	18.00	2.50	1.30	8.54	72.00
Spotted Bass		C	C	N	14	21.00	2.92	4.96	32.72	236.36
Largemouth Bass		C	C	N	2	3.00	0.42	0.41	2.70	136.50
Warmouth Sunfish		C	C	N	5	7.50	1.04	0.11	0.69	14.00
Green Sunfish		I	C	T	3	4.50	0.63	0.03	0.20	6.67
Bluegill Sunfish		I	C	P	1	1.50	0.21	0.02	0.10	10.00
Longear Sunfish		I	C	M	35	52.50	7.29	1.68	11.04	31.91
Dusky Darter		I	S	M	5	7.50	1.04	0.03	0.22	4.40
Blackside Darter		I	S	N	8	12.00	1.67	0.04	0.24	3.00
Logperch		I	S	M	3	4.50	0.63	0.06	0.40	13.33
Johnny Darter		I	C	N	5	7.50	1.04	0.02	0.10	2.00
Banded Darter		I	S	I	6	9.00	1.25	0.03	0.18	3.00
Fantail Darter		I	C	N	3	4.50	0.63	0.02	0.10	3.33
			Data Totals:		480	720.00		15.17		
			Number of Species:		24					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-07-19**
River Mile:	**90.0**	Location:	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.				
Time Fished:	3004 sec	Drainage:	136.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	8	12.00	3.94	0.07	0.71	6.00
Golden Redhorse		I	S	M	9	13.50	4.43	2.73	26.89	202.22
Northern Hog Sucker		I	S	M	15	22.50	7.39	1.89	18.60	83.93
Creek Chub		G	N	T	1	1.50	0.49	0.01	0.12	8.00
Striped Shiner		I	S	N	43	64.50	21.18	0.76	7.51	11.81
Bluntnose Minnow		O	C	T	19	28.50	9.36	0.08	0.74	2.63
Central Stoneroller		H	N	N	7	10.50	3.45	0.08	0.80	7.71
Rock Bass		C	C	N	12	18.00	5.91	1.20	11.82	66.67
Spotted Bass		C	C	N	6	9.00	2.96	1.46	14.33	161.67
Largemouth Bass		C	C	N	3	4.50	1.48	0.51	5.07	114.33
Warmouth Sunfish		C	C	N	1	1.50	0.49	0.02	0.21	14.00
Bluegill Sunfish		I	C	P	3	4.50	1.48	0.08	0.74	16.67
Longear Sunfish		I	C	M	27	40.50	13.30	1.05	10.34	25.93
Redear Sunfish		I	C	N	1	1.50	0.49	0.03	0.27	18.00
Hybrid x Sunfish				N	1	1.50	0.49	0.03	0.30	20.00
Dusky Darter		I	S	M	6	9.00	2.96	0.03	0.30	3.33
Blackside Darter		I	S	N	7	10.50	3.45	0.02	0.21	2.00
Logperch		I	S	M	4	6.00	1.97	0.06	0.56	9.50
Johnny Darter		I	C	N	4	6.00	1.97	0.01	0.09	1.50
Banded Darter		I	S	I	5	7.50	2.46	0.01	0.12	1.60
Fantail Darter		I	C	N	21	31.50	10.34	0.03	0.29	0.95
			Data Totals:		203	304.50		10.15		
			Number of Species:		21					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-23**
River Mile:	**89.4**	Location:	RACCOON CREEK DST. HEWETT FORK @ CO. RD. 18 B				
Time Fished:	3473 sec	Drainage:	176.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.4 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	4	10.00	1.37	0.10	0.37	10.00
Golden Redhorse		I	S	M	19	47.50	6.48	6.85	25.25	144.21
Northern Hog Sucker		I	S	M	13	32.50	4.44	2.77	10.19	85.08
White Sucker		O	S	T	1	2.50	0.34	1.75	6.45	700.00
Spotted Sucker		I	S	N	1	2.50	0.34	1.63	5.99	650.00
Creek Chub		G	N	T	9	22.50	3.07	0.76	2.80	33.78
Redfin Shiner		I	N	N	2	5.00	0.68	0.01	0.03	1.50
Striped Shiner		I	S	N	80	200.00	27.30	1.13	4.17	5.65
Spotfin Shiner		I	M	N	1	2.50	0.34	0.01	0.03	3.00
Bluntnose Minnow		O	C	T	38	95.00	12.97	0.28	1.03	2.95
Central Stoneroller		H	N	N	18	45.00	6.14	0.51	1.86	11.22
Yellow Bullhead		I	C	T	1	2.50	0.34	0.69	2.53	275.00
Brook Silverside		I	M	M	6	15.00	2.05	0.03	0.09	1.67
Rock Bass		C	C	N	12	30.00	4.10	2.48	9.12	82.50
Spotted Bass		C	C	N	13	32.50	4.44	2.85	10.51	87.69
Largemouth Bass		C	C	N	1	2.50	0.34	1.88	6.91	750.00
Warmouth Sunfish		C	C	N	2	5.00	0.68	0.26	0.94	51.00
Bluegill Sunfish		I	C	P	5	12.50	1.71	0.88	3.23	70.00
Longear Sunfish		I	C	M	37	92.50	12.63	2.00	7.35	21.57
Dusky Darter		I	S	M	1	2.50	0.34	0.00	0.01	1.00
Blackside Darter		I	S	N	7	17.50	2.39	0.07	0.26	4.00
Logperch		I	S	M	10	25.00	3.41	0.20	0.74	8.00
Johnny Darter		I	C	N	5	12.50	1.71	0.01	0.05	1.00
Banded Darter		I	S	I	4	10.00	1.37	0.02	0.06	1.50
Fantail Darter		I	C	N	3	7.50	1.02	0.01	0.04	1.33
			Data Totals:		293	732.50		27.13		
			Number of Species:		25					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-09-06**
River Mile:	**84.1**	Location:	RACCOON CREEK NEAR KNOX, UPST ONION CREEK @ ST. RT. 356				
Time Fished:	3467 sec	Drainage:	183.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.48 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.11	0.52	0.02	0.02	10.00
Redfin Pickerel		P	M	P	1	2.11	0.52	0.25	0.20	120.00
Smallmouth Buffalo		I	M	N	2	4.21	1.05	7.16	5.79	1700.00
Golden Redhorse		I	S	M	71	149.47	37.17	35.22	28.50	235.63
Northern Hog Sucker		I	S	M	14	29.47	7.33	1.59	1.28	53.86
White Sucker		O	S	T	3	6.32	1.57	1.75	1.41	276.67
Spotted Sucker		I	S	N	13	27.37	6.81	5.74	4.64	209.62
Common Carp		O	M	T	5	10.53	2.62	44.47	35.99	4225.00
Bluntnose Minnow		O	C	T	3	6.32	1.57	0.01	0.01	1.33
Channel Catfish			C	N	1	2.11	0.52	2.74	2.21	1300.00
Brook Silverside		I	M	M	4	8.42	2.09	0.01	0.01	1.50
White Crappie		I	C	N	2	4.21	1.05	1.47	1.19	350.00
Rock Bass		C	C	N	3	6.32	1.57	0.78	0.63	123.33
Spotted Bass		C	C	N	15	31.58	7.85	2.58	2.09	81.73
Largemouth Bass		C	C	N	5	10.53	2.62	2.06	1.66	195.40
Warmouth Sunfish		C	C	N	9	18.95	4.71	1.12	0.91	59.11
Green Sunfish		I	C	T	1	2.11	0.52	0.03	0.02	12.00
Bluegill Sunfish		I	C	P	11	23.16	5.76	0.91	0.73	39.09
Longear Sunfish		I	C	M	20	42.11	10.47	1.13	0.91	26.84
Hybrid x Sunfish				N	1	2.11	0.52	0.23	0.18	108.00
Blackside Darter		I	S	N	4	8.42	2.09	0.02	0.01	2.00
Freshwater Drum			M	P	2	4.21	1.05	14.32	11.58	3400.00
			Data Totals:		191	402.11		123.59		
			Number of Species:		22					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-08**
River Mile:	**84.1**	Location:	RACCOON CREEK NEAR KNOX, UPST ONION CREEK @ ST. RT. 356				
Time Fished:	3432 sec	Drainage:	183.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	0.51	0.02	0.02	12.00
Redfin Pickerel		P	M	P	1	2.00	0.51	0.04	0.04	20.00
Smallmouth Buffalo		I	M	N	2	4.00	1.01	10.00	10.01	2500.00
Black Redhorse		I	S	I	1	2.00	0.51	1.50	1.50	750.00
Golden Redhorse		I	S	M	41	82.00	20.71	17.63	17.65	214.98
Northern Hog Sucker		I	S	M	16	32.00	8.08	1.32	1.32	41.13
White Sucker		O	S	T	3	6.00	1.52	1.22	1.22	203.33
Spotted Sucker		I	S	N	8	16.00	4.04	4.60	4.61	287.50
Common Carp		O	M	T	6	12.00	3.03	44.40	44.46	3700.00
Striped Shiner		I	S	N	12	24.00	6.06	0.10	0.10	4.33
Bluntnose Minnow		O	C	T	1	2.00	0.51	0.00	0.00	2.00
Yellow Bullhead		I	C	T	3	6.00	1.52	0.90	0.90	150.00
Brown Bullhead		I	C	T	2	4.00	1.01	1.20	1.20	300.00
Brook Silverside		I	M	M	8	16.00	4.04	0.01	0.01	0.75
White Crappie		I	C	N	3	6.00	1.52	0.72	0.72	120.00
Rock Bass		C	C	N	6	12.00	3.03	1.11	1.12	92.83
Spotted Bass		C	C	N	15	30.00	7.58	0.72	0.72	23.87
Largemouth Bass		C	C	N	2	4.00	1.01	2.49	2.49	622.50
Warmouth Sunfish		C	C	N	4	8.00	2.02	0.32	0.32	40.00
Green Sunfish		I	C	T	1	2.00	0.51	0.02	0.02	10.00
Bluegill Sunfish		I	C	P	11	22.00	5.56	0.71	0.71	32.18
Longear Sunfish		I	C	M	34	68.00	17.17	2.29	2.30	33.71
Dusky Darter		I	S	M	2	4.00	1.01	0.02	0.02	5.00
Blackside Darter		I	S	N	6	12.00	3.03	0.04	0.04	3.67
Logperch		I	S	M	3	6.00	1.52	0.06	0.06	10.67
Eastern Sand Darter		I	S	R	1	2.00	0.51	0.00	0.00	2.00
Johnny Darter		I	C	N	4	8.00	2.02	0.01	0.01	1.00
Freshwater Drum			M	P	1	2.00	0.51	8.40	8.41	4200.00
			Data Totals:		198	396.00		99.87		
			Number of Species:		28					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-09-12**
River Mile:	**80.6**	Location:	RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50				
Time Fished:	3212 sec	Drainage:	200.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	2	4.00	0.82	0.02	0.05	6.00
Silver Redhorse		I	S	M	5	10.00	2.04	4.33	9.55	433.00
Golden Redhorse		I	S	M	90	180.00	36.73	27.04	59.62	150.22
Northern Hog Sucker		I	S	M	19	38.00	7.76	2.60	5.72	68.32
Spotted Sucker		I	S	N	6	12.00	2.45	1.32	2.91	110.00
Smallmouth Redhorse		I	S	M	2	4.00	0.82	1.14	2.51	285.00
Striped Shiner		I	S	N	1	2.00	0.41	0.02	0.04	10.00
Bluntnose Minnow		O	C	T	3	6.00	1.22	0.02	0.04	3.33
Brook Silverside		I	M	M	6	12.00	2.45	0.02	0.04	1.67
Rock Bass		C	C	N	4	8.00	1.63	0.63	1.39	78.75
Spotted Bass		C	C	N	12	24.00	4.90	2.33	5.13	96.92
Largemouth Bass		C	C	N	2	4.00	0.82	0.65	1.44	163.50
Warmouth Sunfish		C	C	N	6	12.00	2.45	0.66	1.46	55.00
Green Sunfish		I	C	T	4	8.00	1.63	0.20	0.44	25.00
Bluegill Sunfish		I	C	P	16	32.00	6.53	1.75	3.86	54.69
Longear Sunfish		I	C	M	59	118.00	24.08	2.60	5.74	22.05
Blackside Darter		I	S	N	5	10.00	2.04	0.02	0.04	2.00
Johnny Darter		I	C	N	1	2.00	0.41	0.00	0.00	1.00
Banded Darter		I	S	I	2	4.00	0.82	0.00	0.00	0.50
			Data Totals:		245	490.00		45.36		
			Number of Species:		19					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-24**
River Mile:	**80.6**	Location:	RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50				
Time Fished:	2570 sec	Drainage:	200.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	3	6.00	1.94	0.12	0.32	19.33
Silver Redhorse		I	S	M	1	2.00	0.65	0.35	0.95	175.00
Golden Redhorse		I	S	M	38	76.00	24.52	18.29	49.86	240.61
Northern Hog Sucker		I	S	M	20	40.00	12.90	1.62	4.42	40.50
White Sucker		O	S	T	1	2.00	0.65	0.15	0.41	75.00
Spotted Sucker		I	S	N	4	8.00	2.58	1.15	3.14	143.75
Common Carp		O	M	T	1	2.00	0.65	3.50	9.54	1750.00
Striped Shiner		I	S	N	4	8.00	2.58	0.38	1.04	47.50
Bluntnose Minnow		O	C	T	1	2.00	0.65	0.00	0.01	1.00
Channel Catfish			C	N	1	2.00	0.65	1.80	4.91	900.00
Brook Silverside		I	M	M	7	14.00	4.52	0.02	0.07	1.71
White Crappie		I	C	N	1	2.00	0.65	0.50	1.36	250.00
Rock Bass		C	C	N	9	18.00	5.81	1.66	4.53	92.22
Spotted Bass		C	C	N	12	24.00	7.74	2.87	7.82	119.42
Largemouth Bass		C	C	N	2	4.00	1.29	1.10	3.00	275.00
Warmouth Sunfish		C	C	N	3	6.00	1.94	0.87	2.37	144.67
Bluegill Sunfish		I	C	P	7	14.00	4.52	0.90	2.45	64.29
Longear Sunfish		I	C	M	28	56.00	18.06	1.17	3.20	20.96
Redear Sunfish		I	C	N	1	2.00	0.65	0.15	0.40	74.00
Dusky Darter		I	S	M	2	4.00	1.29	0.02	0.04	4.00
Blackside Darter		I	S	N	7	14.00	4.52	0.04	0.11	2.86
Logperch		I	S	M	1	2.00	0.65	0.02	0.05	10.00
Rainbow Darter		I	S	M	1	2.00	0.65	0.00	0.01	1.00
			Data Totals:		155	310.00		36.67		
			Number of Species:		23					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-07-26**
River Mile:	**72.2**	Location:	RACCOON CREEK AT VALES MILLS @ ST. RT. 346				
Time Fished:	2078 sec	Drainage:	223.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.3 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	C

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Silver Redhorse		I	S	M	5	5.00	1.93	0.48	1.92	96.00
Golden Redhorse		I	S	M	72	72.00	27.80	10.04	40.07	139.44
Northern Hog Sucker		I	S	M	3	3.00	1.16	0.39	1.56	130.67
White Sucker		O	S	T	1	1.00	0.39	0.20	0.80	200.00
Spotted Sucker		I	S	N	2	2.00	0.77	0.21	0.85	106.50
Smallmouth Redhorse		I	S	M	1	1.00	0.39	0.12	0.48	120.00
Common Carp		O	M	T	9	9.00	3.47	4.55	18.16	505.56
Creek Chub		G	N	T	1	1.00	0.39	0.00	0.02	4.00
Striped Shiner		I	S	N	49	49.00	18.92	0.42	1.66	8.47
Bluntnose Minnow		O	C	T	16	16.00	6.18	0.05	0.20	3.13
Central Stoneroller		H	N	N	15	15.00	5.79	0.11	0.45	7.47
Channel Catfish			C	N	1	1.00	0.39	1.63	6.49	1625.00
Rock Bass		C	C	N	2	2.00	0.77	0.24	0.96	120.00
Spotted Bass		C	C	N	11	11.00	4.25	1.85	7.38	168.00
Largemouth Bass		C	C	N	1	1.00	0.39	0.40	1.60	400.00
Bluegill Sunfish		I	C	P	1	1.00	0.39	0.03	0.11	28.00
Longear Sunfish		I	C	M	12	12.00	4.63	0.30	1.20	25.00
Blackside Darter		I	S	N	1	1.00	0.39	0.00	0.01	3.00
Logperch		I	S	M	2	2.00	0.77	0.02	0.09	11.00
Johnny Darter		I	C	N	4	4.00	1.54	0.00	0.02	1.00
Banded Darter		I	S	I	37	37.00	14.29	0.04	0.17	1.17
Fantail Darter		I	C	N	12	12.00	4.63	0.02	0.07	1.50
Freshwater Drum			M	P	1	1.00	0.39	3.95	15.76	3950.00
			Data Totals:		259	259.00		25.06		
			Number of Species:		23					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-10**
River Mile:	**63.8**	Location:	RACCOON CREEK 0.3 MI. UPST. ZINNS RUN @ CO. RD. 28				
Time Fished:	2404 sec	Drainage:	296.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	0.30	0.03	0.07	15.00
Redfin Pickerel		P	M	P	1	2.00	0.30	0.10	0.23	50.00
Silver Redhorse		I	S	M	9	18.00	2.67	9.78	22.05	543.33
Golden Redhorse		I	S	M	68	136.00	20.18	13.64	30.74	100.26
Northern Hog Sucker		I	S	M	27	54.00	8.01	1.60	3.61	29.63
Spotted Sucker		I	S	N	1	2.00	0.30	0.20	0.44	98.00
Smallmouth Redhorse		I	S	M	3	6.00	0.89	0.58	1.31	96.67
Creek Chub		G	N	T	2	4.00	0.59	0.04	0.09	10.00
Redfin Shiner		I	N	N	1	2.00	0.30	0.01	0.01	3.00
Striped Shiner		I	S	N	95	190.00	28.19	1.40	3.16	7.37
Silverjaw Minnow		I	M	N	2	4.00	0.59	0.01	0.02	2.50
Bluntnose Minnow		O	C	T	42	84.00	12.46	0.22	0.49	2.57
Central Stoneroller		H	N	N	5	10.00	1.48	0.11	0.24	10.60
Channel Catfish			C	N	1	2.00	0.30	4.80	10.82	2400.00
Yellow Bullhead		I	C	T	2	4.00	0.59	1.45	3.27	362.50
Flathead Catfish		P	C	N	1	2.00	0.30	1.80	4.06	900.00
Rock Bass		C	C	N	11	22.00	3.26	3.25	7.33	147.73
Spotted Bass		C	C	N	8	16.00	2.37	2.96	6.67	185.00
Green Sunfish		I	C	T	11	22.00	3.26	0.50	1.13	22.73
Bluegill Sunfish		I	C	P	4	8.00	1.19	0.12	0.27	15.00
Longear Sunfish		I	C	M	25	50.00	7.42	1.70	3.82	33.92
Dusky Darter		I	S	M	5	10.00	1.48	0.02	0.05	2.40
Blackside Darter		I	S	N	7	14.00	2.08	0.03	0.06	2.00
Logperch		I	S	M	1	2.00	0.30	0.02	0.05	10.00
Eastern Sand Darter		I	S	R	1	2.00	0.30	0.00	0.01	2.00
Johnny Darter		I	C	N	2	4.00	0.59	0.01	0.01	1.50
Banded Darter		I	S	I	1	2.00	0.30	0.00	0.01	2.00
			Data Totals:		337	674.00		44.36		
			Number of Species:		27					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-09-06**
River Mile:	**55.5**	Location:	RACCOON CREEK S OF CLARION @ ST. RT. 124				
Time Fished:	2042 sec	Drainage:	322.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.65	0.01	0.11	5.00
Silver Redhorse		I	S	M	1	1.50	0.65	0.16	2.28	108.00
Golden Redhorse		I	S	M	5	7.50	3.25	1.05	14.74	139.60
Northern Hog Sucker		I	S	M	19	28.50	12.34	0.49	6.93	17.26
Spotted Sucker		I	S	N	2	3.00	1.30	0.78	11.02	261.00
Smallmouth Redhorse		I	S	M	3	4.50	1.95	0.21	2.96	46.67
Creek Chub		G	N	T	1	1.50	0.65	0.01	0.08	4.00
Striped Shiner		I	S	N	25	37.50	16.23	0.30	4.18	7.92
Silverjaw Minnow		I	M	N	2	3.00	1.30	0.01	0.13	3.00
Bluntnose Minnow		O	C	T	9	13.50	5.84	0.05	0.63	3.33
Yellow Bullhead		I	C	T	1	1.50	0.65	0.32	4.56	216.00
Brook Silverside		I	M	M	4	6.00	2.60	0.01	0.08	1.00
Rock Bass		C	C	N	2	3.00	1.30	0.32	4.44	105.00
Spotted Bass		C	C	N	7	10.50	4.55	1.25	17.61	119.14
Largemouth Bass		C	C	N	1	1.50	0.65	0.27	3.84	182.00
Green Sunfish		I	C	T	13	19.50	8.44	0.57	7.98	29.08
Bluegill Sunfish		I	C	P	3	4.50	1.95	0.17	2.32	36.67
Longear Sunfish		I	C	M	25	37.50	16.23	1.04	14.66	27.76
Dusky Darter		I	S	M	2	3.00	1.30	0.01	0.13	3.00
Blackside Darter		I	S	N	15	22.50	9.74	0.03	0.42	1.33
Logperch		I	S	M	3	4.50	1.95	0.05	0.63	10.00
Johnny Darter		I	C	N	7	10.50	4.55	0.01	0.15	1.00
Banded Darter		I	S	I	2	3.00	1.30	0.01	0.08	2.00
Fantail Darter		I	C	N	1	1.50	0.65	0.00	0.02	1.00
			Data Totals:		154	231.00		7.10		
			Number of Species:		24					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-10**
River Mile:	**55.5**	Location:	RACCOON CREEK S OF CLARION @ ST. RT. 124				
Time Fished:	2300 sec	Drainage:	322.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	0.67	0.02	0.10	8.00
Silver Redhorse		I	S	M	1	2.00	0.67	0.04	0.27	22.00
Golden Redhorse		I	S	M	42	84.00	28.00	5.02	30.39	59.76
Northern Hog Sucker		I	S	M	6	12.00	4.00	0.11	0.65	9.00
White Sucker		O	S	T	1	2.00	0.67	0.55	3.32	274.00
Spotted Sucker		I	S	N	2	4.00	1.33	0.98	5.91	244.00
Smallmouth Redhorse		I	S	M	5	10.00	3.33	0.34	2.03	33.60
Striped Shiner		I	S	N	26	52.00	17.33	0.52	3.12	9.92
Silverjaw Minnow		I	M	N	2	4.00	1.33	0.01	0.05	2.00
Bluntnose Minnow		O	C	T	9	18.00	6.00	0.04	0.22	2.00
Channel Catfish			C	N	1	2.00	0.67	2.00	12.11	1000.00
Yellow Bullhead		I	C	T	4	8.00	2.67	2.39	14.48	299.00
Rock Bass		C	C	N	4	8.00	2.67	1.33	8.06	166.50
Spotted Bass		C	C	N	6	12.00	4.00	1.60	9.66	133.00
Green Sunfish		I	C	T	12	24.00	8.00	0.26	1.57	10.83
Bluegill Sunfish		I	C	P	1	2.00	0.67	0.07	0.44	36.00
Longear Sunfish		I	C	M	23	46.00	15.33	1.24	7.48	26.87
Dusky Darter		I	S	M	1	2.00	0.67	0.01	0.04	3.00
Blackside Darter		I	S	N	2	4.00	1.33	0.01	0.07	3.00
Banded Darter		I	S	I	1	2.00	0.67	0.00	0.02	2.00
			Data Totals:		150	300.00		16.52		
			Number of Species:		20					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-07-25**
River Mile:	**40.0**	Location:	RACCOON CREEK AT VINTON @ ST. RT. 160				
Time Fished:	3079 sec	Drainage:	381.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.55 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Bowfin		P	C	N	1	1.82	0.32	1.82	1.41	1000.00
Redfin Pickerel		P	M	P	2	3.64	0.64	0.01	0.01	4.00
Smallmouth Buffalo		I	M	N	11	20.00	3.54	25.82	20.07	1290.91
Quillback		O	M	N	3	5.45	0.96	4.91	3.82	900.00
Silver Redhorse		I	S	M	17	30.91	5.47	10.04	7.80	324.88
Golden Redhorse		I	S	M	66	120.00	21.22	8.75	6.80	72.89
River Redhorse		I	S	I	1	1.82	0.32	0.86	0.67	475.00
Northern Hog Sucker		I	S	M	12	21.82	3.86	0.24	0.18	10.83
White Sucker		O	S	T	2	3.64	0.64	0.53	0.41	145.00
Spotted Sucker		I	S	N	2	3.64	0.64	0.11	0.08	30.00
Smallmouth Redhorse		I	S	M	67	121.82	21.54	5.46	4.24	44.81
Common Carp		O	M	T	7	12.73	2.25	32.95	25.61	2589.29
Striped Shiner		I	S	N	14	25.45	4.50	0.29	0.22	11.29
Spotfin Shiner		I	M	N	14	25.45	4.50	0.13	0.10	5.00
Sand Shiner		I	M	M	1	1.82	0.32	0.00	0.00	2.00
Mimic Shiner		I	M	I	4	7.27	1.29	0.01	0.01	2.00
Silverjaw Minnow		I	M	N	1	1.82	0.32	0.00	0.00	2.00
Bluntnose Minnow		O	C	T	9	16.36	2.89	0.05	0.04	2.78
Channel Catfish			C	N	2	3.64	0.64	1.73	1.34	475.00
Flathead Catfish		P	C	N	3	5.45	0.96	4.73	3.67	866.67
White Crappie		I	C	N	1	1.82	0.32	0.20	0.15	108.00
Rock Bass		C	C	N	7	12.73	2.25	0.90	0.70	70.57
Spotted Bass		C	C	N	12	21.82	3.86	2.40	1.87	110.17
Largemouth Bass		C	C	N	3	5.45	0.96	1.03	0.80	188.33
Green Sunfish		I	C	T	3	5.45	0.96	0.14	0.11	26.00
Bluegill Sunfish		I	C	P	8	14.55	2.57	1.00	0.78	68.75
Longear Sunfish		I	C	M	12	21.82	3.86	0.76	0.59	34.83
Hybrid x Sunfish				N	1	1.82	0.32	0.07	0.06	40.00
Dusky Darter		I	S	M	2	3.64	0.64	0.01	0.01	4.00
Blackside Darter		I	S	N	1	1.82	0.32	0.01	0.01	4.00
Logperch		I	S	M	3	5.45	0.96	0.05	0.04	8.33
Eastern Sand Darter		I	S	R	3	5.45	0.96	0.01	0.00	1.00
Banded Darter		I	S	I	7	12.73	2.25	0.02	0.01	1.29
Fantail Darter		I	C	N	2	3.64	0.64	0.01	0.01	2.00
Freshwater Drum			M	P	7	12.73	2.25	23.64	18.37	1857.14
			Data Totals:		311	565.45		128.67		
			Number of Species:		35					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-09-08**
River Mile:	**35.6**	Location:	RACCOON CREEK AT WOODS MILL @ EAGLE RD.				
Time Fished:	4167 sec	Drainage:	542.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.6 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	5.00	0.68	0.03	0.03	5.33
Smallmouth Buffalo		I	M	N	11	18.33	2.51	26.72	25.84	1457.50
Quillback		O	M	N	3	5.00	0.68	5.00	4.84	1000.00
Silver Redhorse		I	S	M	21	35.00	4.79	5.99	5.79	171.05
Golden Redhorse		I	S	M	105	175.00	23.97	23.76	22.98	135.78
Northern Hog Sucker		I	S	M	14	23.33	3.20	1.33	1.29	57.14
Spotted Sucker		I	S	N	4	6.67	0.91	0.30	0.29	45.50
Smallmouth Redhorse		I	S	M	43	71.67	9.82	5.95	5.76	83.07
Common Carp		O	M	T	3	5.00	0.68	5.75	5.56	1150.00
Striped Shiner		I	S	N	68	113.33	15.53	0.62	0.60	5.44
Spotfin Shiner		I	M	N	6	10.00	1.37	0.06	0.06	6.33
Sand Shiner		I	M	M	4	6.67	0.91	0.01	0.01	1.25
Mimic Shiner		I	M	I	18	30.00	4.11	0.04	0.04	1.28
Silverjaw Minnow		I	M	N	9	15.00	2.05	0.03	0.03	1.78
Bluntnose Minnow		O	C	T	69	115.00	15.75	0.27	0.26	2.32
Central Stoneroller		H	N	N	3	5.00	0.68	0.04	0.03	7.00
Channel Catfish			C	N	5	8.33	1.14	6.84	6.62	821.00
Flathead Catfish		P	C	N	4	6.67	0.91	4.54	4.39	681.25
Western Mosquitofish		I	N	N	3	5.00	0.68	0.01	0.00	1.00
Brook Silverside		I	M	M	1	1.67	0.23	0.00	0.00	2.00
Black Crappie		I	C	N	1	1.67	0.23	0.10	0.09	58.00
Rock Bass		C	C	N	3	5.00	0.68	0.33	0.32	66.00
Spotted Bass		C	C	N	9	15.00	2.05	0.81	0.79	54.22
Largemouth Bass		C	C	N	5	8.33	1.14	0.67	0.65	80.40
Bluegill Sunfish		I	C	P	3	5.00	0.68	0.17	0.16	33.33
Longear Sunfish		I	C	M	3	5.00	0.68	0.09	0.09	18.67
Hybrid x Sunfish				N	1	1.67	0.23	0.13	0.13	80.00
Dusky Darter		I	S	M	5	8.33	1.14	0.03	0.03	4.00
Blackside Darter		I	S	N	1	1.67	0.23	0.01	0.00	3.00
Logperch		I	S	M	1	1.67	0.23	0.01	0.01	8.00
Eastern Sand Darter		I	S	R	1	1.67	0.23	0.00	0.00	2.00
Johnny Darter		I	C	N	1	1.67	0.23	0.00	0.00	2.00
Banded Darter		I	S	I	2	3.33	0.46	0.01	0.01	3.00
Freshwater Drum			M	P	5	8.33	1.14	13.75	13.30	1650.00
			Data Totals:		438	730.00		103.40		
			Number of Species:		34					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-17**
River Mile:	**35.6**	Location:	RACCOON CREEK AT WOODS MILL @ EAGLE RD.				
Time Fished:	3405 sec	Drainage:	542.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	1	2.00	0.50	0.02	0.03	12.00
Smallmouth Buffalo		I	M	N	5	10.00	2.48	16.80	23.73	1680.00
Silver Redhorse		I	S	M	23	46.00	11.39	25.05	35.38	544.57
Golden Redhorse		I	S	M	60	120.00	29.70	10.04	14.17	83.63
Northern Hog Sucker		I	S	M	10	20.00	4.95	0.87	1.23	43.60
Spotted Sucker		I	S	N	2	4.00	0.99	0.20	0.29	51.00
Smallmouth Redhorse		I	S	M	17	34.00	8.42	3.26	4.60	95.88
Common Carp		O	M	T	1	2.00	0.50	1.02	1.43	508.00
Striped Shiner		I	S	N	11	22.00	5.45	0.36	0.51	16.55
Spotfin Shiner		I	M	N	5	10.00	2.48	0.04	0.06	4.40
Sand Shiner		I	M	M	9	18.00	4.46	0.04	0.05	2.00
Silverjaw Minnow		I	M	N	10	20.00	4.95	0.02	0.03	1.00
Bluntnose Minnow		O	C	T	4	8.00	1.98	0.01	0.01	1.25
Central Stoneroller		H	N	N	5	10.00	2.48	0.04	0.05	3.60
Channel Catfish			C	N	2	4.00	0.99	2.10	2.97	525.00
Flathead Catfish		P	C	N	1	2.00	0.50	0.18	0.26	92.00
Western Mosquitofish		I	N	N	1	2.00	0.50	0.00	0.00	1.00
White Crappie		I	C	N	1	2.00	0.50	0.58	0.82	290.00
Rock Bass		C	C	N	3	6.00	1.49	0.48	0.67	79.33
Spotted Bass		C	C	N	10	20.00	4.95	4.52	6.39	226.10
Warmouth Sunfish		C	C	N	1	2.00	0.50	0.12	0.17	60.00
Longear Sunfish		I	C	M	6	12.00	2.97	0.27	0.38	22.67
Dusky Darter		I	S	M	6	12.00	2.97	0.05	0.07	4.33
Blackside Darter		I	S	N	2	4.00	0.99	0.02	0.02	4.00
Johnny Darter		I	C	N	1	2.00	0.50	0.00	0.00	1.00
Banded Darter		I	S	I	2	4.00	0.99	0.01	0.01	1.50
Freshwater Drum			M	P	3	6.00	1.49	4.70	6.64	783.33
			Data Totals:		202	404.00		70.80		
			Number of Species:		27					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-17**
River Mile:	**29.2**	Location:	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35				
Time Fished:	3478 sec	Drainage:	586.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Smallmouth Buffalo		I	M	N	3	6.00	2.36	9.00	11.70	1500.00
Quillback		O	M	N	2	4.00	1.57	3.96	5.15	990.00
River Carpsucker		O	M	N	1	2.00	0.79	1.80	2.34	900.00
Silver Redhorse		I	S	M	9	18.00	7.09	4.94	6.43	274.67
Golden Redhorse		I	S	M	24	48.00	18.90	9.30	12.08	193.67
Northern Hog Sucker		I	S	M	8	16.00	6.30	0.24	0.31	14.75
Spotted Sucker		I	S	N	2	4.00	1.57	0.99	1.28	247.00
Smallmouth Redhorse		I	S	M	8	16.00	6.30	1.80	2.34	112.50
Common Carp		O	M	T	4	8.00	3.15	14.78	19.21	1847.50
Striped Shiner		I	S	N	13	26.00	10.24	0.20	0.27	7.85
Spotfin Shiner		I	M	N	1	2.00	0.79	0.01	0.01	4.00
Bluntnose Minnow		O	C	T	3	6.00	2.36	0.01	0.02	2.00
Channel Catfish			C	N	5	10.00	3.94	13.40	17.41	1340.00
Flathead Catfish		P	C	N	2	4.00	1.57	2.52	3.27	630.00
White Crappie		I	C	N	1	2.00	0.79	0.40	0.52	200.00
Black Crappie		I	C	N	1	2.00	0.79	0.60	0.78	300.00
Rock Bass		C	C	N	4	8.00	3.15	0.66	0.86	82.50
Spotted Bass		C	C	N	10	20.00	7.87	4.10	5.33	205.00
Green Sunfish		I	C	T	2	4.00	1.57	0.06	0.08	15.00
Bluegill Sunfish		I	C	P	4	8.00	3.15	0.50	0.64	62.00
Longear Sunfish		I	C	M	8	16.00	6.30	0.41	0.53	25.50
Dusky Darter		I	S	M	3	6.00	2.36	0.02	0.03	4.00
Blackside Darter		I	S	N	3	6.00	2.36	0.02	0.03	3.33
Logperch		I	S	M	1	2.00	0.79	0.02	0.03	12.00
Johnny Darter		I	C	N	1	2.00	0.79	0.00	0.00	1.00
Banded Darter		I	S	I	2	4.00	1.57	0.01	0.01	1.50
Freshwater Drum			M	P	2	4.00	1.57	7.20	9.36	1800.00
			Data Totals:		127	254.00		76.95		
			Number of Species:		27					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-07-13**
River Mile:	**29.2**	Location:	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35				
Time Fished:	3754 sec	Drainage:	586.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Smallmouth Buffalo		I	M	N	10	20.00	2.83	30.90	22.03	1545.00
Quillback		O	M	N	5	10.00	1.42	11.20	7.99	1120.00
Silver Redhorse		I	S	M	23	46.00	6.52	27.24	19.42	592.22
Golden Redhorse		I	S	M	63	126.00	17.85	20.15	14.37	159.90
Northern Hog Sucker		I	S	M	6	12.00	1.70	0.16	0.11	13.33
White Sucker		O	S	T	1	2.00	0.28	0.50	0.36	250.00
Spotted Sucker		I	S	N	5	10.00	1.42	1.82	1.30	182.40
Smallmouth Redhorse		I	S	M	12	24.00	3.40	4.92	3.51	205.17
Common Carp		O	M	T	7	14.00	1.98	33.18	23.66	2370.00
Striped Shiner		I	S	N	30	60.00	8.50	0.44	0.31	7.33
Spotfin Shiner		I	M	N	15	30.00	4.25	0.20	0.14	6.53
Sand Shiner		I	M	M	3	6.00	0.85	0.01	0.01	1.67
Mimic Shiner		I	M	I	3	6.00	0.85	0.01	0.01	1.67
Silverjaw Minnow		I	M	N	11	22.00	3.12	0.06	0.04	2.73
Bluntnose Minnow		O	C	T	75	150.00	21.25	0.44	0.31	2.93
Central Stoneroller		H	N	N	1	2.00	0.28	0.00	0.00	2.00
Channel Catfish			C	N	3	6.00	0.85	2.64	1.88	439.33
Flathead Catfish		P	C	N	1	2.00	0.28	2.40	1.71	1200.00
Black Crappie		I	C	N	1	2.00	0.28	0.06	0.04	30.00
Rock Bass		C	C	N	3	6.00	0.85	0.36	0.25	59.33
Spotted Bass		C	C	N	13	26.00	3.68	1.81	1.29	69.62
Green Sunfish		I	C	T	5	10.00	1.42	0.18	0.13	18.00
Bluegill Sunfish		I	C	P	17	34.00	4.82	0.74	0.53	21.88
Longear Sunfish		I	C	M	11	22.00	3.12	0.63	0.45	28.73
Hybrid x Sunfish				N	1	2.00	0.28	0.02	0.01	10.00
Dusky Darter		I	S	M	12	24.00	3.40	0.08	0.06	3.50
Blackside Darter		I	S	N	8	16.00	2.27	0.04	0.03	2.25
Logperch		I	S	M	2	4.00	0.57	0.04	0.03	10.00
Banded Darter		I	S	I	3	6.00	0.85	0.01	0.01	1.33
Fantail Darter		I	C	N	3	6.00	0.85	0.01	0.01	1.33
			Data Totals:		353	706.00		140.25		
			Number of Species:		30					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-31**
River Mile:	**22.0**	Location:	RACCOON CREEK ADJ. DAN JONES RD				
Time Fished:	2396 sec	Drainage:	615.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	0.39	0.02	0.03	10.00
Longnose Gar		P	M	N	1	2.00	0.39	0.10	0.13	50.00
Smallmouth Buffalo		I	M	N	2	4.00	0.78	4.20	5.57	1050.00
Quillback		O	M	N	1	2.00	0.39	1.80	2.39	900.00
River Carpsucker		O	M	N	2	4.00	0.78	5.80	7.70	1450.00
Silver Redhorse		I	S	M	14	28.00	5.47	9.48	12.58	338.57
Golden Redhorse		I	S	M	37	74.00	14.45	9.58	12.71	129.46
Northern Hog Sucker		I	S	M	11	22.00	4.30	0.62	0.82	28.18
Spotted Sucker		I	S	N	5	10.00	1.95	0.24	0.32	24.40
Smallmouth Redhorse		I	S	M	25	50.00	9.77	2.29	3.04	45.80
Common Carp		O	M	T	2	4.00	0.78	9.00	11.94	2250.00
Emerald Shiner		I	M	N	1	2.00	0.39	0.01	0.01	3.00
Striped Shiner		I	S	N	15	30.00	5.86	0.32	0.42	10.53
Spotfin Shiner		I	M	N	6	12.00	2.34	0.04	0.06	3.67
Mimic Shiner		I	M	I	3	6.00	1.17	0.01	0.01	1.33
Silverjaw Minnow		I	M	N	4	8.00	1.56	0.02	0.03	3.00
Bluntnose Minnow		O	C	T	46	92.00	17.97	0.19	0.25	2.09
Central Stoneroller		H	N	N	2	4.00	0.78	0.02	0.02	4.00
Channel Catfish			C	N	6	12.00	2.34	8.40	11.15	700.00
Rock Bass		C	C	N	5	10.00	1.95	0.96	1.27	96.00
Spotted Bass		C	C	N	21	42.00	8.20	2.47	3.28	58.80
Largemouth Bass		C	C	N	1	2.00	0.39	0.45	0.60	225.00
Green Sunfish		I	C	T	1	2.00	0.39	0.03	0.04	16.00
Bluegill Sunfish		I	C	P	1	2.00	0.39	0.03	0.04	14.00
Longear Sunfish		I	C	M	10	20.00	3.91	0.53	0.70	26.40
Hybrid x Sunfish				N	1	2.00	0.39	0.10	0.13	50.00
Dusky Darter		I	S	M	12	24.00	4.69	0.06	0.08	2.50
Blackside Darter		I	S	N	6	12.00	2.34	0.02	0.02	1.33
Logperch		I	S	M	1	2.00	0.39	0.02	0.02	8.00
Johnny Darter		I	C	N	1	2.00	0.39	0.00	0.00	1.00
Banded Darter		I	S	I	6	12.00	2.34	0.02	0.02	1.33
Fantail Darter		I	C	N	1	2.00	0.39	0.00	0.00	1.00
Freshwater Drum			M	P	5	10.00	1.95	18.55	24.61	1855.00
			Data Totals:		256	512.00		75.37		
			Number of Species:		33					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-07-13**
River Mile:	**22.0**	Location:	RACCOON CREEK ADJ. DAN JONES RD				
Time Fished:	2622 sec	Drainage:	615.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	0.36	0.02	0.03	8.00
Black Buffalo		I	M	N	1	2.00	0.36	2.30	4.15	1150.00
Smallmouth Buffalo		I	M	N	1	2.00	0.36	3.00	5.41	1500.00
Silver Redhorse		I	S	M	11	22.00	3.94	8.25	14.88	375.00
Black Redhorse		I	S	I	1	2.00	0.36	0.60	1.08	300.00
Golden Redhorse		I	S	M	29	58.00	10.39	11.19	20.18	192.86
Northern Hog Sucker		I	S	M	17	34.00	6.09	1.05	1.89	30.88
Spotted Sucker		I	S	N	2	4.00	0.72	0.18	0.32	45.00
Smallmouth Redhorse		I	S	M	28	56.00	10.04	3.60	6.49	64.29
Emerald Shiner		I	M	N	2	4.00	0.72	0.01	0.02	3.00
Striped Shiner		I	S	N	12	24.00	4.30	0.14	0.25	5.83
Spotfin Shiner		I	M	N	11	22.00	3.94	0.13	0.23	5.82
Sand Shiner		I	M	M	39	78.00	13.98	0.15	0.27	1.92
Silverjaw Minnow		I	M	N	41	82.00	14.70	0.21	0.38	2.54
Bluntnose Minnow		O	C	T	5	10.00	1.79	0.02	0.03	1.60
Central Stoneroller		H	N	N	13	26.00	4.66	0.10	0.19	4.00
Channel Catfish			C	N	4	8.00	1.43	4.60	8.30	575.00
Flathead Catfish		P	C	N	2	4.00	0.72	8.80	15.87	2200.00
Rock Bass		C	C	N	2	4.00	0.72	0.13	0.23	32.50
Spotted Bass		C	C	N	10	20.00	3.58	2.01	3.62	100.40
Bluegill Sunfish		I	C	P	13	26.00	4.66	0.72	1.31	27.85
Longear Sunfish		I	C	M	13	26.00	4.66	0.63	1.13	24.15
Hybrid x Sunfish				N	1	2.00	0.36	0.02	0.03	8.00
Dusky Darter		I	S	M	7	14.00	2.51	0.03	0.06	2.29
Blackside Darter		I	S	N	2	4.00	0.72	0.01	0.02	3.00
Logperch		I	S	M	2	4.00	0.72	0.04	0.06	9.00
Banded Darter		I	S	I	6	12.00	2.15	0.01	0.03	1.17
Freshwater Drum			M	P	3	6.00	1.08	7.50	13.53	1250.00
			Data Totals:		279	558.00		55.44		
			Number of Species:		28					
			Number of Hybrids:		1					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-08-29**
River Mile:	**10.2**	Location:	RACCOON CREEK AT NORTHUP, DST. DAM				
Time Fished:	3184 sec	Drainage:	648.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Gizzard Shad		O	M	N	18	36.00	6.59	1.74	2.12	48.33
Smallmouth Buffalo		I	M	N	2	4.00	0.73	8.70	10.59	2175.00
Silver Redhorse		I	S	M	8	16.00	2.93	8.56	10.43	535.25
Golden Redhorse		I	S	M	12	24.00	4.40	2.95	3.59	123.00
Northern Hog Sucker		I	S	M	4	8.00	1.47	0.18	0.21	22.00
Smallmouth Redhorse		I	S	M	11	22.00	4.03	1.62	1.97	73.45
Common Carp		O	M	T	3	6.00	1.10	19.10	23.26	3183.33
Emerald Shiner		I	M	N	49	98.00	17.95	0.20	0.24	2.04
Striped Shiner		I	S	N	2	4.00	0.73	0.01	0.01	1.50
Spotfin Shiner		I	M	N	23	46.00	8.42	0.08	0.09	1.65
Sand Shiner		I	M	M	14	28.00	5.13	0.03	0.04	1.14
Mimic Shiner		I	M	I	47	94.00	17.22	0.11	0.13	1.17
Bluntnose Minnow		O	C	T	28	56.00	10.26	0.06	0.08	1.15
Central Stoneroller		H	N	N	4	8.00	1.47	0.03	0.04	4.00
Channel Catfish			C	N	4	8.00	1.47	3.06	3.73	383.00
Flathead Catfish		P	C	N	1	2.00	0.37	18.60	22.65	9300.00
Brook Silverside		I	M	M	2	4.00	0.73	0.01	0.01	1.50
Spotted Bass		C	C	N	13	26.00	4.76	1.90	2.32	73.23
Bluegill Sunfish		I	C	P	3	6.00	1.10	0.14	0.18	24.00
Orangespotted Sunfish		I	C	N	1	2.00	0.37	0.02	0.02	10.00
Longear Sunfish		I	C	M	6	12.00	2.20	0.18	0.22	15.00
Dusky Darter		I	S	M	1	2.00	0.37	0.01	0.01	6.00
Logperch		I	S	M	3	6.00	1.10	0.05	0.06	8.33
Banded Darter		I	S	I	1	2.00	0.37	0.00	0.00	2.00
Freshwater Drum			M	P	13	26.00	4.76	14.76	17.98	567.85
			Data Totals:		273	546.00		82.12		
			Number of Species:		25					
			Number of Hybrids:		0					

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**			Sample Date:	**2016-07-25**
River Mile:	**10.2**	Location:	RACCOON CREEK AT NORTHUP, DST. DAM				
Time Fished:	3094 sec	Drainage:	648.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.5 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Mooneye		I	M	R	1	2.00	0.31	0.23	0.34	114.00
Gizzard Shad		O	M	N	20	40.00	6.23	2.00	3.00	50.00
Smallmouth Buffalo		I	M	N	5	10.00	1.56	14.80	22.22	1480.00
Quillback		O	M	N	2	4.00	0.62	5.50	8.26	1375.00
Silver Redhorse		I	S	M	4	8.00	1.25	0.73	1.10	91.50
Golden Redhorse		I	S	M	10	20.00	3.12	2.02	3.03	100.90
Northern Hog Sucker		I	S	M	4	8.00	1.25	0.36	0.55	45.50
Smallmouth Redhorse		I	S	M	9	18.00	2.80	2.44	3.66	135.33
Bigeye Chub		I	S	I	2	4.00	0.62	0.02	0.02	4.00
Creek Chub		G	N	T	1	2.00	0.31	0.04	0.06	20.00
Emerald Shiner		I	M	N	62	124.00	19.31	0.30	0.45	2.43
Striped Shiner		I	S	N	4	8.00	1.25	0.06	0.08	7.00
Spotfin Shiner		I	M	N	46	92.00	14.33	0.22	0.33	2.36
Sand Shiner		I	M	M	25	50.00	7.79	0.05	0.08	1.04
Mimic Shiner		I	M	I	64	128.00	19.94	0.13	0.20	1.03
Bluntnose Minnow		O	C	T	1	2.00	0.31	0.00	0.01	2.00
Central Stoneroller		H	N	N	1	2.00	0.31	0.02	0.02	8.00
Channel Catfish			C	N	6	12.00	1.87	4.50	6.75	375.00
Flathead Catfish		P	C	N	2	4.00	0.62	7.00	10.51	1750.00
Rock Bass		C	C	N	1	2.00	0.31	0.02	0.03	10.00
Smallmouth Bass		C	C	M	1	2.00	0.31	0.10	0.15	50.00
Spotted Bass		C	C	N	10	20.00	3.12	1.50	2.26	75.20
Bluegill Sunfish		I	C	P	2	4.00	0.62	0.08	0.12	20.00
Longear Sunfish		I	C	M	4	8.00	1.25	0.12	0.18	15.00
Sauger		P	S	N	2	4.00	0.62	2.10	3.15	525.00
Dusky Darter		I	S	M	4	8.00	1.25	0.03	0.05	3.75
Logperch		I	S	M	2	4.00	0.62	0.02	0.03	5.00
Banded Darter		I	S	I	2	4.00	0.62	0.01	0.01	1.50
Sauger x Walleye		P		N	2	4.00	0.62	0.60	0.90	150.00
Freshwater Drum			M	P	22	44.00	6.85	21.63	32.47	491.59
			Data Totals:		321	642.00		66.62		
			Number of Species:		30					
			Number of Hybrids:		1					

River Code:	**09-500-011**	Stream:	**TRIB. TO RACCOON CREEK (RM 98.96)**			Sample Date:	**2016-09-19**
River Mile:	**0.1**	Location:	TRIB. TO RACCOON CREEK (98.96) SW OF ZALESKI @ MOUTH				
Time Fished:	526 sec	Drainage:	1.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	I	Sampler Type:	F

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	13	31.20	17.33	0.00	#Error	0.00
White Sucker		O	S	T	1	2.40	1.33	0.00	#Error	0.00
Striped Shiner		I	S	N	5	12.00	6.67	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	4	9.60	5.33	0.00	#Error	0.00
Yellow Bullhead		I	C	T	33	79.20	44.00	0.00	#Error	0.00
Largemouth Bass		C	C	N	11	26.40	14.67	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	4	9.60	5.33	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.40	1.33	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.40	1.33	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.40	1.33	0.00	#Error	0.00
Redear Sunfish		I	C	N	1	2.40	1.33	0.00	#Error	0.00
		Data Totals:			75	180.00		0.00		
		Number of Species:			11					
		Number of Hybrids:			0					

River Code:	**09-500-012**	Stream:	**BIG BEAVER CREEK**			Sample Date:	**2016-06-28**
River Mile:	**0.9**	Location:	BIG BEAVER CREEK AT GUTHRE RD. S. OF RIO GRANDE				
Time Fished:	2763 sec	Drainage:	7.3 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	22	44.00	5.30	0.00	#Error	0.00
Silver Redhorse		I	S	M	1	2.00	0.24	0.00	#Error	0.00
Golden Redhorse		I	S	M	1	2.00	0.24	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	2	4.00	0.48	0.00	#Error	0.00
White Sucker		O	S	T	101	202.00	24.34	0.00	#Error	0.00
Creek Chub		G	N	T	153	306.00	36.87	0.00	#Error	0.00
Redfin Shiner		I	N	N	1	2.00	0.24	0.00	#Error	0.00
Striped Shiner		I	S	N	52	104.00	12.53	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	2	4.00	0.48	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	21	42.00	5.06	0.00	#Error	0.00
Central Stoneroller		H	N	N	8	16.00	1.93	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.24	0.00	#Error	0.00
Spotted Bass		C	C	N	2	4.00	0.48	0.00	#Error	0.00
Green Sunfish		I	C	T	22	44.00	5.30	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	6.00	0.72	0.00	#Error	0.00
Longear Sunfish		I	C	M	3	6.00	0.72	0.00	#Error	0.00
Hybrid x Sunfish				N	2	4.00	0.48	0.00	#Error	0.00
Blackside Darter		I	S	N	5	10.00	1.20	0.00	#Error	0.00
Logperch		I	S	M	2	4.00	0.48	0.00	#Error	0.00
Johnny Darter		I	C	N	4	8.00	0.96	0.00	#Error	0.00
Fantail Darter		I	C	N	7	14.00	1.69	0.00	#Error	0.00
			Data Totals:		415	830.00		0.00		
			Number of Species:		21					
			Number of Hybrids:		1					

River Code:	**09-502-000**	Stream:	**BULLSKIN CREEK**			Sample Date:	**2016-09-14**
River Mile:	**0.4**	Location:	BULLSKIN CREEK AT THIVENOR @ ST. RT. 218				
Time Fished:	1605 sec	Drainage:	14.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	7	14.00	1.52	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	22	44.00	4.77	0.00	#Error	0.00
Spotted Sucker		I	S	N	2	4.00	0.43	0.00	#Error	0.00
Creek Chub		G	N	T	13	26.00	2.82	0.00	#Error	0.00
Striped Shiner		I	S	N	83	166.00	18.00	0.00	#Error	0.00
Spotfin Shiner		I	M	N	2	4.00	0.43	0.00	#Error	0.00
Sand Shiner		I	M	M	4	8.00	0.87	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	19	38.00	4.12	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	79	158.00	17.14	0.00	#Error	0.00
Central Stoneroller		H	N	N	104	208.00	22.56	0.00	#Error	0.00
Brook Silverside		I	M	M	3	6.00	0.65	0.00	#Error	0.00
Rock Bass		C	C	N	6	12.00	1.30	0.00	#Error	0.00
Smallmouth Bass		C	C	M	2	4.00	0.43	0.00	#Error	0.00
Spotted Bass		C	C	N	12	24.00	2.60	0.00	#Error	0.00
Largemouth Bass		C	C	N	3	6.00	0.65	0.00	#Error	0.00
Green Sunfish		I	C	T	35	70.00	7.59	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	6.00	0.65	0.00	#Error	0.00
Longear Sunfish		I	C	M	15	30.00	3.25	0.00	#Error	0.00
Hybrid x Sunfish				N	2	4.00	0.43	0.00	#Error	0.00
Logperch		I	S	M	2	4.00	0.43	0.00	#Error	0.00
Johnny Darter		I	C	N	13	26.00	2.82	0.00	#Error	0.00
Rainbow Darter		I	S	M	17	34.00	3.69	0.00	#Error	0.00
Fantail Darter		I	C	N	13	26.00	2.82	0.00	#Error	0.00
			Data Totals:		461	922.00		0.00		
			Number of Species:		23					
			Number of Hybrids:		1					

River Code:	**09-502-000**	Stream:	**BULLSKIN CREEK**			Sample Date:	**2016-06-28**
River Mile:	**0.4**	Location:	BULLSKIN CREEK AT THIVENOR @ ST. RT. 218				
Time Fished:	1316 sec	Drainage:	14.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	0.32	0.00	#Error	0.00
Silver Redhorse		I	S	M	1	2.00	0.32	0.00	#Error	0.00
Golden Redhorse		I	S	M	8	16.00	2.58	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	19	38.00	6.13	0.00	#Error	0.00
Creek Chub		G	N	T	4	8.00	1.29	0.00	#Error	0.00
Striped Shiner		I	S	N	55	110.00	17.74	0.00	#Error	0.00
Spotfin Shiner		I	M	N	1	2.00	0.32	0.00	#Error	0.00
Sand Shiner		I	M	M	2	4.00	0.65	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	12	24.00	3.87	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	57	114.00	18.39	0.00	#Error	0.00
Central Stoneroller		H	N	N	12	24.00	3.87	0.00	#Error	0.00
Channel Catfish			C	N	2	4.00	0.65	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.32	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	2.00	0.32	0.00	#Error	0.00
Rock Bass		C	C	N	8	16.00	2.58	0.00	#Error	0.00
Smallmouth Bass		C	C	M	1	2.00	0.32	0.00	#Error	0.00
Spotted Bass		C	C	N	3	6.00	0.97	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.32	0.00	#Error	0.00
Green Sunfish		I	C	T	34	68.00	10.97	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.00	0.65	0.00	#Error	0.00
Longear Sunfish		I	C	M	18	36.00	5.81	0.00	#Error	0.00
Hybrid x Sunfish				N	1	2.00	0.32	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	0.32	0.00	#Error	0.00
Johnny Darter		I	C	N	16	32.00	5.16	0.00	#Error	0.00
Rainbow Darter		I	S	M	32	64.00	10.32	0.00	#Error	0.00
Fantail Darter		I	C	N	17	34.00	5.48	0.00	#Error	0.00
			Data Totals:		310	620.00		0.00		
			Number of Species:		26					
			Number of Hybrids:		1					

River Code:	**09-503-000**	Stream:	**LITTLE BULLSKIN CREEK**			Sample Date:	**2016-08-01**
River Mile:	**0.0**	Location:	L. BULLSKIN CREEK SW OF THIVENOR @ MOUTH				
Time Fished:	1100 sec	Drainage:	4.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	18	43.20	3.69	0.00	#Error	0.00
Blacknose Dace		G	S	T	77	184.80	15.78	0.00	#Error	0.00
Creek Chub		G	N	T	68	163.20	13.93	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	95	228.00	19.47	0.00	#Error	0.00
Central Stoneroller		H	N	N	168	403.20	34.43	0.00	#Error	0.00
Creek Chub x Southern Redbelly Dace				N	1	2.40	0.20	0.00	#Error	0.00
Green Sunfish		I	C	T	26	62.40	5.33	0.00	#Error	0.00
Johnny Darter		I	C	N	4	9.60	0.82	0.00	#Error	0.00
Rainbow Darter		I	S	M	8	19.20	1.64	0.00	#Error	0.00
Fantail Darter		I	C	N	23	55.20	4.71	0.00	#Error	0.00
			Data Totals:		488	1171.20		0.00		
			Number of Species:		10					
			Number of Hybrids:		1					

River Code:	**09-506-000**	Stream:	**CLEAR FORK**			Sample Date:	**2016-09-13**
River Mile:	**0.0**	Location:	CLEAR FORK NEAR NORTHUP @ INGALLS RD.				
Time Fished:	1277 sec	Drainage:	7.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.16 km	Basin:	Southeast Ohio River Tribs	Flow:	L	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Gizzard Shad		O	M	N	1	1.82	0.30	0.00	#Error	0.00
Smallmouth Buffalo		I	M	N	2	3.64	0.60	0.00	#Error	0.00
Silver Redhorse		I	S	M	3	5.45	0.91	0.00	#Error	0.00
Golden Redhorse		I	S	M	4	7.27	1.21	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	2	3.64	0.60	0.00	#Error	0.00
White Sucker		O	S	T	1	1.82	0.30	0.00	#Error	0.00
Spotted Sucker		I	S	N	3	5.45	0.91	0.00	#Error	0.00
Smallmouth Redhorse		I	S	M	1	1.82	0.30	0.00	#Error	0.00
Creek Chub		G	N	T	4	7.27	1.21	0.00	#Error	0.00
Emerald Shiner		I	M	N	34	61.82	10.27	0.00	#Error	0.00
Striped Shiner		I	S	N	34	61.82	10.27	0.00	#Error	0.00
Spotfin Shiner		I	M	N	88	160.00	26.59	0.00	#Error	0.00
Sand Shiner		I	M	M	19	34.55	5.74	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	3	5.45	0.91	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	82	149.09	24.77	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	1.82	0.30	0.00	#Error	0.00
Channel Catfish			C	N	2	3.64	0.60	0.00	#Error	0.00
Brook Silverside		I	M	M	2	3.64	0.60	0.00	#Error	0.00
Spotted Bass		C	C	N	5	9.09	1.51	0.00	#Error	0.00
Largemouth Bass		C	C	N	18	32.73	5.44	0.00	#Error	0.00
Green Sunfish		I	C	T	3	5.45	0.91	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	9	16.36	2.72	0.00	#Error	0.00
Longear Sunfish		I	C	M	3	5.45	0.91	0.00	#Error	0.00
Redear Sunfish		I	C	N	2	3.64	0.60	0.00	#Error	0.00
Logperch		I	S	M	2	3.64	0.60	0.00	#Error	0.00
Johnny Darter		I	C	N	1	1.82	0.30	0.00	#Error	0.00
Freshwater Drum			M	P	2	3.64	0.60	0.00	#Error	0.00
			Data Totals:		331	601.82		0.00		
			Number of Species:		27					
			Number of Hybrids:		0					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2016-08-16**
River Mile:	**27.9**	Location:	L. RACCOON CREEK UPST. MEADOW RUN @ CO. RD. 39				
Time Fished:	2400 sec	Drainage:	48.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.3 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Bowfin		P	C	N	4	13.33	2.12	13.92	11.65	1043.75
Gizzard Shad		O	M	N	8	26.67	4.23	5.83	4.88	218.75
Redfin Pickerel		P	M	P	3	10.00	1.59	0.49	0.41	48.67
Northern Hog Sucker		I	S	M	1	3.33	0.53	0.01	0.01	2.00
Spotted Sucker		I	S	N	25	83.33	13.23	22.27	18.64	267.20
Common Carp		O	M	T	8	26.67	4.23	54.58	45.69	2046.88
Striped Shiner		I	S	N	1	3.33	0.53	0.11	0.09	34.00
Yellow Bullhead		I	C	T	1	3.33	0.53	0.58	0.49	175.00
Brook Silverside		I	M	M	2	6.67	1.06	0.01	0.01	1.00
Spotted Bass		C	C	N	6	20.00	3.17	1.78	1.49	88.83
Largemouth Bass		C	C	N	7	23.33	3.70	9.20	7.70	394.29
Warmouth Sunfish		C	C	N	5	16.67	2.65	0.57	0.48	34.40
Green Sunfish		I	C	T	1	3.33	0.53	0.05	0.04	16.00
Bluegill Sunfish		I	C	P	91	303.33	48.15	7.34	6.14	24.20
Longear Sunfish		I	C	M	7	23.33	3.70	0.45	0.38	19.43
Redear Sunfish		I	C	N	16	53.33	8.47	2.00	1.67	37.47
Hybrid x Sunfish				N	1	3.33	0.53	0.27	0.23	82.00
Johnny Darter		I	C	N	1	3.33	0.53	0.00	0.00	1.00
Fantail Darter		I	C	N	1	3.33	0.53	0.00	0.00	1.00
			Data Totals:		189	630.00		119.47		
			Number of Species:		19					
			Number of Hybrids:		1					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2016-08-16**
River Mile:	**24.6**	Location:	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32				
Time Fished:	2782 sec	Drainage:	62.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.3 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Bowfin		P	C	N	1	3.33	0.67	3.33	3.57	1000.00
Redfin Pickerel		P	M	P	1	3.33	0.67	0.10	0.11	31.00
Golden Redhorse		I	S	M	3	10.00	2.00	5.83	6.25	583.33
Northern Hog Sucker		I	S	M	3	10.00	2.00	0.63	0.68	63.00
Spotted Sucker		I	S	N	5	16.67	3.33	3.50	3.75	210.00
Common Carp		O	M	T	6	20.00	4.00	41.50	44.49	2075.00
Striped Shiner		I	S	N	1	3.33	0.67	0.13	0.14	38.00
Bluntnose Minnow		O	C	T	1	3.33	0.67	0.00	0.00	1.00
Channel Catfish			C	N	1	3.33	0.67	8.83	9.47	2650.00
Yellow Bullhead		I	C	T	3	10.00	2.00	2.13	2.28	213.00
Brown Bullhead		I	C	T	1	3.33	0.67	1.33	1.43	400.00
Brook Silverside		I	M	M	2	6.67	1.33	0.01	0.01	1.00
Spotted Bass		C	C	N	1	3.33	0.67	0.50	0.54	150.00
Largemouth Bass		C	C	N	6	20.00	4.00	5.58	5.99	279.17
Warmouth Sunfish		C	C	N	5	16.67	3.33	0.41	0.44	24.40
Green Sunfish		I	C	T	1	3.33	0.67	0.02	0.02	6.00
Bluegill Sunfish		I	C	P	49	163.33	32.67	3.93	4.21	24.06
Longear Sunfish		I	C	M	38	126.67	25.33	1.91	2.04	15.05
Redear Sunfish		I	C	N	17	56.67	11.33	1.16	1.25	20.53
Hybrid x Sunfish				N	1	3.33	0.67	0.40	0.43	121.00
Dusky Darter		I	S	M	2	6.67	1.33	0.03	0.04	5.00
Freshwater Drum			M	P	2	6.67	1.33	12.00	12.86	1800.00
			Data Totals:		150	500.00		93.28		
			Number of Species:		22					
			Number of Hybrids:		1					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2017-09-07**
River Mile:	**18.5**	Location:	L. RACCOON CREEK @ BUCKEYE FURNACE RD.				
Time Fished:	2227 sec	Drainage:	87.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	4.55	0.01	0.59	8.00
Redfin Pickerel		P	M	P	2	3.00	9.09	0.06	2.80	19.00
Yellow Bullhead		I	C	T	3	4.50	13.64	0.77	37.57	170.00
Rock Bass		C	C	N	1	1.50	4.55	0.01	0.37	5.00
Spotted Bass		C	C	N	2	3.00	9.09	0.83	40.66	276.00
Green Sunfish		I	C	T	3	4.50	13.64	0.06	2.80	12.67
Bluegill Sunfish		I	C	P	1	1.50	4.55	0.17	8.40	114.00
Longear Sunfish		I	C	M	2	3.00	9.09	0.06	2.95	20.00
Redear Sunfish		I	C	N	1	1.50	4.55	0.06	3.17	43.00
Johnny Darter		I	C	N	2	3.00	9.09	0.00	0.22	1.50
Banded Darter		I	S	I	3	4.50	13.64	0.01	0.33	1.50
Fantail Darter		I	C	N	1	1.50	4.55	0.00	0.15	2.00
			Data Totals:		22	33.00		2.04		
			Number of Species:		12					
			Number of Hybrids:		0					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2016-09-07**
River Mile:	**18.5**	Location:	L. RACCOON CREEK @ BUCKEYE FURNACE RD.				
Time Fished:	3333 sec	Drainage:	87.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.25 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	1	1.20	2.08	0.01	0.33	12.00
Northern Hog Sucker		I	S	M	14	16.80	29.17	0.60	13.90	35.71
White Sucker		O	S	T	1	1.20	2.08	0.36	8.34	300.00
Smallmouth Redhorse		I	S	M	1	1.20	2.08	0.18	4.17	150.00
Bluntnose Minnow		O	C	T	1	1.20	2.08	0.00	0.11	4.00
Brown Bullhead		I	C	T	1	1.20	2.08	0.32	7.40	266.00
Rock Bass		C	C	N	4	4.80	8.33	0.50	11.68	105.00
Spotted Bass		C	C	N	3	3.60	6.25	0.26	6.12	73.33
Largemouth Bass		C	C	N	3	3.60	6.25	1.50	34.76	416.67
Warmouth Sunfish		C	C	N	1	1.20	2.08	0.06	1.39	50.00
Green Sunfish		I	C	T	4	4.80	8.33	0.07	1.67	15.00
Bluegill Sunfish		I	C	P	1	1.20	2.08	0.06	1.33	48.00
Longear Sunfish		I	C	M	4	4.80	8.33	0.36	8.23	74.00
Dusky Darter		I	S	M	1	1.20	2.08	0.01	0.17	6.00
Blackside Darter		I	S	N	4	4.80	8.33	0.01	0.28	2.50
Johnny Darter		I	C	N	1	1.20	2.08	0.00	0.03	1.00
Banded Darter		I	S	I	2	2.40	4.17	0.00	0.06	1.00
Fantail Darter		I	C	N	1	1.20	2.08	0.00	0.03	1.00
			Data Totals:		48	57.60		4.32		
			Number of Species:		18					
			Number of Hybrids:		0					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2016-06-23**
River Mile:	**12.7**	Location:	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.				
Time Fished:	2186 sec	Drainage:	99.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.4 km	Basin:	Southeast Ohio River Tribs	Flow:	L	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.50	0.60	0.02	0.11	8.00
Redfin Pickerel		P	M	P	1	2.50	0.60	0.10	0.54	40.00
Silver Redhorse		I	S	M	2	5.00	1.20	0.37	1.97	73.00
Golden Redhorse		I	S	M	14	35.00	8.38	3.00	16.18	85.79
Northern Hog Sucker		I	S	M	31	77.50	18.56	2.03	10.94	26.19
White Sucker		O	S	T	2	5.00	1.20	0.49	2.65	98.50
Spotted Sucker		I	S	N	1	2.50	0.60	0.01	0.07	5.00
Striped Shiner		I	S	N	30	75.00	17.96	0.50	2.69	6.67
Spotfin Shiner		I	M	N	1	2.50	0.60	0.02	0.11	8.00
Silverjaw Minnow		I	M	N	2	5.00	1.20	0.01	0.05	2.00
Bluntnose Minnow		O	C	T	33	82.50	19.76	0.20	1.05	2.36
Central Stoneroller		H	N	N	1	2.50	0.60	0.02	0.11	8.00
Yellow Bullhead		I	C	T	2	5.00	1.20	1.38	7.41	275.00
Brook Silverside		I	M	M	3	7.50	1.80	0.02	0.08	2.00
Rock Bass		C	C	N	11	27.50	6.59	3.58	19.28	130.09
Spotted Bass		C	C	N	3	7.50	1.80	1.77	9.54	236.00
Largemouth Bass		C	C	N	5	12.50	2.99	1.91	10.29	152.80
Green Sunfish		I	C	T	4	10.00	2.40	0.37	1.99	37.00
Bluegill Sunfish		I	C	P	5	12.50	2.99	1.60	8.64	128.20
Longear Sunfish		I	C	M	7	17.50	4.19	1.05	5.66	60.00
Dusky Darter		I	S	M	1	2.50	0.60	0.03	0.16	12.00
Logperch		I	S	M	5	12.50	2.99	0.08	0.43	6.40
Johnny Darter		I	C	N	2	5.00	1.20	0.01	0.04	1.50
			Data Totals:		167	417.50		18.56		
			Number of Species:		23					
			Number of Hybrids:		0					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2016-09-07**
River Mile:	**11.0**	Location:	L. RACCOON CREEK @ JACKSON/GALLIA COUNTY LINE				
Time Fished:	1782 sec	Drainage:	129.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.25 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	4.00	0.89	0.02	0.06	6.00
Golden Redhorse		I	S	M	6	24.00	5.36	7.76	19.79	323.33
Northern Hog Sucker		I	S	M	10	40.00	8.93	0.82	2.08	20.40
White Sucker		O	S	T	1	4.00	0.89	1.44	3.67	360.00
Spotted Sucker		I	S	N	1	4.00	0.89	0.02	0.06	6.00
Smallmouth Redhorse		I	S	M	3	12.00	2.68	5.20	13.26	433.33
Common Carp		O	M	T	1	4.00	0.89	2.60	6.63	650.00
Striped Shiner		I	S	N	4	16.00	3.57	0.06	0.14	3.50
Silverjaw Minnow		I	M	N	2	8.00	1.79	0.02	0.06	3.00
Bluntnose Minnow		O	C	T	49	196.00	43.75	0.28	0.71	1.43
Channel Catfish			C	N	1	4.00	0.89	2.80	7.14	700.00
Yellow Bullhead		I	C	T	1	4.00	0.89	0.80	2.04	200.00
Western Mosquitofish		I	N	N	1	4.00	0.89	0.00	0.01	1.00
Rock Bass		C	C	N	3	12.00	2.68	0.67	1.71	56.00
Spotted Bass		C	C	N	11	44.00	9.82	8.20	20.91	186.27
Largemouth Bass		C	C	N	2	8.00	1.79	1.80	4.59	225.00
Warmouth Sunfish		C	C	N	1	4.00	0.89	0.19	0.49	48.00
Green Sunfish		I	C	T	3	12.00	2.68	0.70	1.80	58.67
Bluegill Sunfish		I	C	P	1	4.00	0.89	0.01	0.03	3.00
Longear Sunfish		I	C	M	3	12.00	2.68	0.73	1.86	60.67
Hybrid x Sunfish				N	2	8.00	1.79	0.25	0.63	31.00
Blackside Darter		I	S	N	1	4.00	0.89	0.01	0.02	2.00
Johnny Darter		I	C	N	3	12.00	2.68	0.02	0.04	1.33
Freshwater Drum			M	P	1	4.00	0.89	4.80	12.24	1200.00
			Data Totals:		112	448.00		39.20		
			Number of Species:		24					
			Number of Hybrids:		1					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2016-08-09**
River Mile:	**11.0**	Location:	L. RACCOON CREEK @ JACKSON/GALLIA COUNTY LINE				
Time Fished:	2044 sec	Drainage:	129.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.3 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	A

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	3.33	1.06	0.03	0.06	8.00
Smallmouth Buffalo		I	M	N	1	3.33	1.06	7.83	16.95	2350.00
Silver Redhorse		I	S	M	4	13.33	4.26	5.75	12.44	431.25
Golden Redhorse		I	S	M	10	33.33	10.64	5.85	12.65	175.40
Northern Hog Sucker		I	S	M	7	23.33	7.45	0.25	0.53	10.57
White Sucker		O	S	T	2	6.67	2.13	2.75	5.95	412.50
Spotted Sucker		I	S	N	1	3.33	1.06	0.75	1.62	225.00
Smallmouth Redhorse		I	S	M	1	3.33	1.06	0.42	0.90	125.00
Striped Shiner		I	S	N	5	16.67	5.32	0.20	0.43	12.00
Mimic Shiner		I	M	I	2	6.67	2.13	0.01	0.03	2.00
Silverjaw Minnow		I	M	N	2	6.67	2.13	0.01	0.03	2.00
Bluntnose Minnow		O	C	T	35	116.67	37.23	0.25	0.55	2.17
Channel Catfish			C	N	1	3.33	1.06	3.00	6.49	900.00
Western Mosquitofish		I	N	N	3	10.00	3.19	0.00	0.01	0.33
Rock Bass		C	C	N	3	10.00	3.19	0.55	1.18	54.67
Spotted Bass		C	C	N	8	26.67	8.51	9.67	20.92	362.50
Green Sunfish		I	C	T	3	10.00	3.19	0.15	0.32	14.67
Longear Sunfish		I	C	M	2	6.67	2.13	0.47	1.01	70.00
Green SF x Hybrid				N	1	3.33	1.06	0.24	0.52	72.00
Logperch		I	S	M	1	3.33	1.06	0.04	0.09	12.00
Freshwater Drum			M	P	1	3.33	1.06	8.00	17.31	2400.00
			Data Totals:		94	313.33		46.21		
			Number of Species:		21					
			Number of Hybrids:		1					

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**			Sample Date:	**2016-09-01**
River Mile:	**1.2**	Location:	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325				
Time Fished:	2440 sec	Drainage:	154.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.36	0.01	0.05	6.00
Redfin Pickerel		P	M	P	2	3.00	0.71	0.03	0.18	10.00
Golden Redhorse		I	S	M	9	13.50	3.21	1.97	11.77	146.22
Northern Hog Sucker		I	S	M	35	52.50	12.50	1.43	8.51	27.20
Smallmouth Redhorse		I	S	M	2	3.00	0.71	0.41	2.41	135.00
Striped Shiner		I	S	N	53	79.50	18.93	0.48	2.86	6.04
Spotfin Shiner		I	M	N	1	1.50	0.36	0.00	0.02	2.00
Sand Shiner		I	M	M	1	1.50	0.36	0.00	0.01	1.00
Mimic Shiner		I	M	I	4	6.00	1.43	0.01	0.04	1.25
Bluntnose Minnow		O	C	T	42	63.00	15.00	0.05	0.29	0.76
Channel Catfish			C	N	1	1.50	0.36	1.84	10.95	1225.00
Flathead Catfish		P	C	N	1	1.50	0.36	0.90	5.37	600.00
Brook Silverside		I	M	M	6	9.00	2.14	0.01	0.05	1.00
Rock Bass		C	C	N	9	13.50	3.21	1.34	7.96	98.89
Spotted Bass		C	C	N	13	19.50	4.64	2.82	16.78	144.38
Green Sunfish		I	C	T	20	30.00	7.14	0.86	5.10	28.53
Bluegill Sunfish		I	C	P	1	1.50	0.36	0.03	0.20	22.00
Longear Sunfish		I	C	M	2	3.00	0.71	0.27	1.63	91.00
Dusky Darter		I	S	M	8	12.00	2.86	0.05	0.30	4.25
Blackside Darter		I	S	N	12	18.00	4.29	0.05	0.30	2.83
Logperch		I	S	M	1	1.50	0.36	0.02	0.09	10.00
Eastern Sand Darter		I	S	R	1	1.50	0.36	0.00	0.02	2.00
Johnny Darter		I	C	N	27	40.50	9.64	0.03	0.18	0.74
Banded Darter		I	S	I	20	30.00	7.14	0.05	0.27	1.50
Fantail Darter		I	C	N	7	10.50	2.50	0.01	0.06	1.00
Freshwater Drum			M	P	1	1.50	0.36	4.13	24.59	2750.00
			Data Totals:		280	420.00		16.78		
			Number of Species:		26					
			Number of Hybrids:		0					

River Code:	**09-511-000**	Stream:	**DEER CREEK**			Sample Date:	**2016-08-01**
River Mile:	**0.2**	Location:	DEER CREEK NEAR VINTON, NEAR MOUTH ADJ. ST. RT. 325				
Time Fished:	876 sec	Drainage:	5.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	1	2.00	1.05	0.00	#Error	0.00
White Sucker		O	S	T	5	10.00	5.26	0.00	#Error	0.00
Creek Chub		G	N	T	66	132.00	69.47	0.00	#Error	0.00
Striped Shiner		I	S	N	1	2.00	1.05	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	5	10.00	5.26	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	2.00	1.05	0.00	#Error	0.00
Spotted Bass		C	C	N	1	2.00	1.05	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	1.05	0.00	#Error	0.00
Johnny Darter		I	C	N	6	12.00	6.32	0.00	#Error	0.00
Fantail Darter		I	C	N	8	16.00	8.42	0.00	#Error	0.00
			Data Totals:		95	190.00		0.00		
			Number of Species:		10					
			Number of Hybrids:		0					

River Code:	**09-514-000**	Stream:	**DICKASON RUN**			Sample Date:	**2016-07-20**
River Mile:	**2.4**	Location:	DICKASON RUN @ KEYSTONE FURNACE RD.				
Time Fished:	1476 sec	Drainage:	17.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	16	32.00	28.57	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	4	8.00	7.14	0.00	#Error	0.00
Redfin Shiner		I	N	N	1	2.00	1.79	0.00	#Error	0.00
Yellow Bullhead		I	C	T	10	20.00	17.86	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	2	4.00	3.57	0.00	#Error	0.00
Green Sunfish		I	C	T	7	14.00	12.50	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	4	8.00	7.14	0.00	#Error	0.00
Longear Sunfish		I	C	M	6	12.00	10.71	0.00	#Error	0.00
Hybrid x Sunfish				N	5	10.00	8.93	0.00	#Error	0.00
Banded Darter		I	S	I	1	2.00	1.79	0.00	#Error	0.00
			Data Totals:		56	112.00		0.00		
			Number of Species:		10					
			Number of Hybrids:		1					

River Code:	**09-514-000**	Stream:	**DICKASON RUN**			Sample Date:	**2016-09-07**
River Mile:	**0.1**	Location:	DICKASON RUN NEAR KEYSTONE @ ORPHEUS-KEYSTONE RD.				
Time Fished:	1465 sec	Drainage:	26.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	1.15	0.01	0.75	8.00
Redfin Pickerel		P	M	P	1	1.50	1.15	0.02	0.94	10.00
Northern Hog Sucker		I	S	M	10	15.00	11.49	0.21	13.10	14.00
Creek Chub		G	N	T	3	4.50	3.45	0.14	8.61	30.67
Striped Shiner		I	S	N	29	43.50	33.33	0.50	30.87	11.38
Silverjaw Minnow		I	M	N	5	7.50	5.75	0.02	0.94	2.00
Bluntnose Minnow		O	C	T	7	10.50	8.05	0.02	1.12	1.71
Spotted Bass		C	C	N	1	1.50	1.15	0.01	0.56	6.00
Largemouth Bass		C	C	N	2	3.00	2.30	0.30	18.52	99.00
Green Sunfish		I	C	T	12	18.00	13.79	0.32	19.64	17.50
Longear Sunfish		I	C	M	1	1.50	1.15	0.06	3.55	38.00
Johnny Darter		I	C	N	9	13.50	10.34	0.01	0.75	0.89
Banded Darter		I	S	I	3	4.50	3.45	0.01	0.37	1.33
Fantail Darter		I	C	N	3	4.50	3.45	0.00	0.28	1.00
			Data Totals:		87	130.50		1.60		
			Number of Species:		14					
			Number of Hybrids:		0					

River Code:	**09-514-000**	Stream:	**DICKASON RUN**			Sample Date:	**2016-07-20**
River Mile:	**0.1**	Location:	DICKASON RUN NEAR KEYSTONE @ ORPHEUS-KEYSTONE RD.				
Time Fished:	2286 sec	Drainage:	26.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.68	0.01	0.48	6.00
Redfin Pickerel		P	M	P	3	4.50	2.04	0.08	3.99	16.67
Northern Hog Sucker		I	S	M	8	12.00	5.44	0.14	7.18	11.25
Creek Chub		G	N	T	18	27.00	12.24	0.33	17.39	12.11
Striped Shiner		I	S	N	37	55.50	25.17	0.42	22.50	7.62
Silverjaw Minnow		I	M	N	28	42.00	19.05	0.10	5.21	2.33
Bluntnose Minnow		O	C	T	18	27.00	12.24	0.05	2.55	1.78
Yellow Bullhead		I	C	T	1	1.50	0.68	0.35	18.35	230.00
Black Bullhead		I	C	P	1	1.50	0.68	0.18	9.57	120.00
Spotted Bass		C	C	N	1	1.50	0.68	0.03	1.76	22.00
Green Sunfish		I	C	T	13	19.50	8.84	0.18	9.57	9.23
Blackside Darter		I	S	N	2	3.00	1.36	0.00	0.16	1.00
Johnny Darter		I	C	N	10	15.00	6.80	0.01	0.72	0.90
Banded Darter		I	S	I	3	4.50	2.04	0.01	0.32	1.33
Fantail Darter		I	C	N	3	4.50	2.04	0.00	0.24	1.00
			Data Totals:		147	220.50		1.88		
			Number of Species:		15					
			Number of Hybrids:		0					

River Code:	**09-524-000**	Stream:	**MEADOW RUN**			Sample Date:	**2016-09-13**
River Mile:	**3.1**	Location:	MEADOW RUN UPST. JENO'S				
Time Fished:	922 sec	Drainage:	5.1 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	5	10.00	2.18	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	1	2.00	0.44	0.00	#Error	0.00
White Sucker		O	S	T	55	110.00	24.02	0.00	#Error	0.00
Golden Shiner		I	M	T	1	2.00	0.44	0.00	#Error	0.00
Creek Chub		G	N	T	113	226.00	49.34	0.00	#Error	0.00
Striped Shiner		I	S	N	24	48.00	10.48	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.44	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	7	14.00	3.06	0.00	#Error	0.00
Yellow Bullhead		I	C	T	2	4.00	0.87	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.44	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	1	2.00	0.44	0.00	#Error	0.00
Green Sunfish		I	C	T	6	12.00	2.62	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.00	0.87	0.00	#Error	0.00
Redear Sunfish		I	C	N	3	6.00	1.31	0.00	#Error	0.00
Johnny Darter		I	C	N	7	14.00	3.06	0.00	#Error	0.00
			Data Totals:		229	458.00		0.00		
			Number of Species:		15					
			Number of Hybrids:		0					

River Code:	**09-524-000**	Stream:	**MEADOW RUN**			Sample Date:	**2016-08-03**
River Mile:	**3.1**	Location:	MEADOW RUN UPST. JENO'S				
Time Fished:	1740 sec	Drainage:	5.1 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	9	18.00	3.46	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	3	6.00	1.15	0.00	#Error	0.00
White Sucker		O	S	T	66	132.00	25.38	0.00	#Error	0.00
Golden Shiner		I	M	T	2	4.00	0.77	0.00	#Error	0.00
Creek Chub		G	N	T	95	190.00	36.54	0.00	#Error	0.00
Striped Shiner		I	S	N	28	56.00	10.77	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	19	38.00	7.31	0.00	#Error	0.00
Central Stoneroller		H	N	N	3	6.00	1.15	0.00	#Error	0.00
Yellow Bullhead		I	C	T	6	12.00	2.31	0.00	#Error	0.00
Spotted Bass		C	C	N	4	8.00	1.54	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.38	0.00	#Error	0.00
Green Sunfish		I	C	T	7	14.00	2.69	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.00	0.77	0.00	#Error	0.00
Redear Sunfish		I	C	N	3	6.00	1.15	0.00	#Error	0.00
Blackside Darter		I	S	N	2	4.00	0.77	0.00	#Error	0.00
Johnny Darter		I	C	N	10	20.00	3.85	0.00	#Error	0.00
			Data Totals:		260	520.00		0.00		
			Number of Species:		16					
			Number of Hybrids:		0					

River Code:	**09-524-000**	Stream:	**MEADOW RUN**			Sample Date:	**2016-09-13**
River Mile:	**2.2**	Location:	MEADOW RUN @ OLD/NEW ST. RT. 327, DST.TRIBS (RM 2.18)				
Time Fished:	1848 sec	Drainage:	8.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.16 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	2	3.64	0.91	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	4	7.27	1.83	0.00	#Error	0.00
White Sucker		O	S	T	58	105.45	26.48	0.00	#Error	0.00
Golden Shiner		I	M	T	4	7.27	1.83	0.00	#Error	0.00
Creek Chub		G	N	T	24	43.64	10.96	0.00	#Error	0.00
Striped Shiner		I	S	N	11	20.00	5.02	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	53	96.36	24.20	0.00	#Error	0.00
Central Stoneroller		H	N	N	7	12.73	3.20	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	1.82	0.46	0.00	#Error	0.00
Largemouth Bass		C	C	N	3	5.45	1.37	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	1	1.82	0.46	0.00	#Error	0.00
Green Sunfish		I	C	T	9	16.36	4.11	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	15	27.27	6.85	0.00	#Error	0.00
Longear Sunfish		I	C	M	8	14.55	3.65	0.00	#Error	0.00
Redear Sunfish		I	C	N	10	18.18	4.57	0.00	#Error	0.00
Blackside Darter		I	S	N	4	7.27	1.83	0.00	#Error	0.00
Johnny Darter		I	C	N	4	7.27	1.83	0.00	#Error	0.00
Fantail Darter		I	C	N	1	1.82	0.46	0.00	#Error	0.00
			Data Totals:		219	398.18		0.00		
			Number of Species:		18					
			Number of Hybrids:		0					

River Code:	**09-524-000**	Stream:	**MEADOW RUN**			Sample Date:	**2016-08-03**
River Mile:	**2.2**	Location:	MEADOW RUN @ OLD/NEW ST. RT. 327, DST.TRIBS (RM 2.18)				
Time Fished:	2104 sec	Drainage:	8.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.16 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	3	5.45	1.31	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	2	3.64	0.87	0.00	#Error	0.00
White Sucker		O	S	T	43	78.18	18.78	0.00	#Error	0.00
Golden Shiner		I	M	T	3	5.45	1.31	0.00	#Error	0.00
Creek Chub		G	N	T	36	65.45	15.72	0.00	#Error	0.00
Striped Shiner		I	S	N	18	32.73	7.86	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	10	18.18	4.37	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	22	40.00	9.61	0.00	#Error	0.00
Central Stoneroller		H	N	N	4	7.27	1.75	0.00	#Error	0.00
Yellow Bullhead		I	C	T	14	25.45	6.11	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	9	16.36	3.93	0.00	#Error	0.00
Green Sunfish		I	C	T	25	45.45	10.92	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	7	12.73	3.06	0.00	#Error	0.00
Longear Sunfish		I	C	M	13	23.64	5.68	0.00	#Error	0.00
Redear Sunfish		I	C	N	6	10.91	2.62	0.00	#Error	0.00
Blackside Darter		I	S	N	6	10.91	2.62	0.00	#Error	0.00
Johnny Darter		I	C	N	4	7.27	1.75	0.00	#Error	0.00
Fantail Darter		I	C	N	4	7.27	1.75	0.00	#Error	0.00
			Data Totals:		229	416.36		0.00		
			Number of Species:		18					
			Number of Hybrids:		0					

River Code:	**09-524-000**	Stream:	**MEADOW RUN**			Sample Date:	**2016-09-07**
River Mile:	**0.7**	Location:	MEADOW RUN E OF WELLSTON @ CHEATWOOD RD/T-383				
Time Fished:	1400 sec	Drainage:	9.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.16 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	5	9.09	5.49	0.00	#Error	0.00
Golden Redhorse		I	S	M	1	1.82	1.10	0.00	#Error	0.00
White Sucker		O	S	T	28	50.91	30.77	0.00	#Error	0.00
Common Carp		O	M	T	4	7.27	4.40	0.00	#Error	0.00
Striped Shiner		I	S	N	1	1.82	1.10	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	2	3.64	2.20	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	1.82	1.10	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	1.82	1.10	0.00	#Error	0.00
Brook Silverside		I	M	M	5	9.09	5.49	0.00	#Error	0.00
Largemouth Bass		C	C	N	2	3.64	2.20	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	2	3.64	2.20	0.00	#Error	0.00
Green Sunfish		I	C	T	4	7.27	4.40	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	8	14.55	8.79	0.00	#Error	0.00
Longear Sunfish		I	C	M	18	32.73	19.78	0.00	#Error	0.00
Redear Sunfish		I	C	N	8	14.55	8.79	0.00	#Error	0.00
Johnny Darter		I	C	N	1	1.82	1.10	0.00	#Error	0.00
			Data Totals:		91	165.45		0.00		
			Number of Species:		16					
			Number of Hybrids:		0					

River Code:	**09-528-000**	Stream:	**MCCONNEL RUN**			Sample Date:	**2016-06-29**
River Mile:	**2.0**	Location:	MCCONNEL RUN AT LAKE RD (CR 15) N OF LAKE RUPERT				
Time Fished:	737 sec	Drainage:	0.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.13 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	9	20.93	5.26	0.00	#Error	0.00
Golden Shiner		I	M	T	1	2.33	0.58	0.00	#Error	0.00
Blacknose Dace		G	S	T	1	2.33	0.58	0.00	#Error	0.00
Creek Chub		G	N	T	63	146.51	36.84	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	2	4.65	1.17	0.00	#Error	0.00
Spotted Bass		C	C	N	1	2.33	0.58	0.00	#Error	0.00
Green Sunfish		I	C	T	5	11.63	2.92	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	87	202.33	50.88	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.33	0.58	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.33	0.58	0.00	#Error	0.00
			Data Totals:		171	397.67		0.00		
			Number of Species:		10					
			Number of Hybrids:		0					

River Code:	**09-530-000**	Stream:	**ELK FORK**			Sample Date:	**2016-09-12**
River Mile:	**13.9**	Location:	ELK FORK NEAR MCARTHUR, UPST. PUNCHEON FORK @ GRAVEL ROAD				
Time Fished:	2440 sec	Drainage:	14.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.17	0.00	#Error	0.00
Golden Redhorse		I	S	M	1	1.50	0.17	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	13	19.50	2.22	0.00	#Error	0.00
Creek Chub		G	N	T	38	57.00	6.50	0.00	#Error	0.00
Redfin Shiner		I	N	N	19	28.50	3.25	0.00	#Error	0.00
Striped Shiner		I	S	N	146	219.00	24.96	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	26	39.00	4.44	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	119	178.50	20.34	0.00	#Error	0.00
Central Stoneroller		H	N	N	55	82.50	9.40	0.00	#Error	0.00
Yellow Bullhead		I	C	T	7	10.50	1.20	0.00	#Error	0.00
Brook Silverside		I	M	M	14	21.00	2.39	0.00	#Error	0.00
Rock Bass		C	C	N	11	16.50	1.88	0.00	#Error	0.00
Spotted Bass		C	C	N	4	6.00	0.68	0.00	#Error	0.00
Largemouth Bass		C	C	N	2	3.00	0.34	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	6	9.00	1.03	0.00	#Error	0.00
Green Sunfish		I	C	T	32	48.00	5.47	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	61	91.50	10.43	0.00	#Error	0.00
Longear Sunfish		I	C	M	13	19.50	2.22	0.00	#Error	0.00
Hybrid x Sunfish				N	2	3.00	0.34	0.00	#Error	0.00
Blackside Darter		I	S	N	1	1.50	0.17	0.00	#Error	0.00
Johnny Darter		I	C	N	10	15.00	1.71	0.00	#Error	0.00
Fantail Darter		I	C	N	4	6.00	0.68	0.00	#Error	0.00
			Data Totals:		585	877.50		0.00		
			Number of Species:		22					
			Number of Hybrids:		1					

River Code:	**09-530-000**	Stream:	**ELK FORK**			Sample Date:	**2016-08-24**
River Mile:	**13.3**	Location:	ELK FORK 1 MI. E OF MCARTHUR @ ST. RT. 50				
Time Fished:	2045 sec	Drainage:	24.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.20	0.01	0.04	6.00
Golden Redhorse		I	S	M	55	82.50	10.76	10.54	51.26	127.81
Northern Hog Sucker		I	S	M	54	81.00	10.57	3.53	17.14	43.52
White Sucker		O	S	T	2	3.00	0.39	0.49	2.37	162.50
Spotted Sucker		I	S	N	1	1.50	0.20	0.49	2.37	325.00
Creek Chub		G	N	T	37	55.50	7.24	0.60	2.93	10.86
Redfin Shiner		I	N	N	4	6.00	0.78	0.01	0.04	1.50
Striped Shiner		I	S	N	79	118.50	15.46	0.92	4.49	7.79
Silverjaw Minnow		I	M	N	1	1.50	0.20	0.00	0.01	2.00
Bluntnose Minnow		O	C	T	58	87.00	11.35	0.13	0.63	1.48
Central Stoneroller		H	N	N	42	63.00	8.22	0.22	1.08	3.52
Yellow Bullhead		I	C	T	4	6.00	0.78	0.60	2.89	99.25
Brook Silverside		I	M	M	7	10.50	1.37	0.01	0.05	1.00
Rock Bass		C	C	N	6	9.00	1.17	0.17	0.82	18.67
Largemouth Bass		C	C	N	5	7.50	0.98	0.74	3.59	98.40
Green Sunfish		I	C	T	15	22.50	2.94	0.44	2.13	19.47
Bluegill Sunfish		I	C	P	45	67.50	8.81	0.47	2.26	6.89
Longear Sunfish		I	C	M	35	52.50	6.85	1.02	4.96	19.43
Blackside Darter		I	S	N	8	12.00	1.57	0.02	0.12	2.00
Logperch		I	S	M	7	10.50	1.37	0.09	0.44	8.57
Johnny Darter		I	C	N	12	18.00	2.35	0.02	0.07	0.83
Fantail Darter		I	C	N	33	49.50	6.46	0.06	0.31	1.28
			Data Totals:		511	766.50		20.57		
			Number of Species:		22					
			Number of Hybrids:		0					

River Code:	**09-530-000**	Stream:	**ELK FORK**			Sample Date:	**2016-07-20**
River Mile:	**13.3**	Location:	ELK FORK 1 MI. E OF MCARTHUR @ ST. RT. 50				
Time Fished:	2635 sec	Drainage:	24.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Golden Redhorse		I	S	M	29	43.50	4.92	7.33	34.01	168.57
Northern Hog Sucker		I	S	M	28	42.00	4.75	3.25	15.07	77.38
White Sucker		O	S	T	12	18.00	2.04	1.54	7.15	85.58
Spotted Sucker		I	S	N	1	1.50	0.17	0.27	1.25	180.00
Creek Chub		G	N	T	29	43.50	4.92	0.16	0.74	3.65
Redfin Shiner		I	N	N	5	7.50	0.85	0.02	0.08	2.40
Striped Shiner		I	S	N	113	169.50	19.19	0.89	4.14	5.27
Silverjaw Minnow		I	M	N	4	6.00	0.68	0.03	0.12	4.25
Bluntnose Minnow		O	C	T	99	148.50	16.81	0.34	1.58	2.29
Central Stoneroller		H	N	N	90	135.00	15.28	0.47	2.16	3.46
Yellow Bullhead		I	C	T	9	13.50	1.53	1.66	7.70	123.00
Brown Bullhead		I	C	T	1	1.50	0.17	0.45	2.09	300.00
Rock Bass		C	C	N	12	18.00	2.04	1.05	4.89	58.58
Spotted Bass		C	C	N	10	15.00	1.70	0.84	3.92	56.30
Largemouth Bass		C	C	N	3	4.50	0.51	1.27	5.90	282.67
Green Sunfish		I	C	T	7	10.50	1.19	0.12	0.54	11.14
Bluegill Sunfish		I	C	P	66	99.00	11.21	0.83	3.84	8.35
Longear Sunfish		I	C	M	29	43.50	4.92	0.89	4.11	20.34
Hybrid x Sunfish				N	4	6.00	0.68	0.04	0.19	7.00
Blackside Darter		I	S	N	3	4.50	0.51	0.02	0.07	3.33
Logperch		I	S	M	1	1.50	0.17	0.01	0.06	8.00
Johnny Darter		I	C	N	2	3.00	0.34	0.00	0.02	1.50
Fantail Darter		I	C	N	32	48.00	5.43	0.08	0.37	1.66
			Data Totals:		589	883.50		21.56		
			Number of Species:		23					
			Number of Hybrids:		1					

River Code:	**09-530-000**	Stream:	**ELK FORK**	Sample Date:	**2017-09-06**
River Mile:	**8.6**	Location:	ELK FORK SW OF PRATTSVILLE @ GRAVEL ROAD DST. WOLF RUN		
Time Fished:	2331 sec	Drainage:	44.4 sq mi	Depth:	Data Source:
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow: N	Sampler Type: E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.61	0.03	0.60	19.00
Golden Redhorse		I	S	M	3	4.50	1.83	0.31	6.46	68.33
Northern Hog Sucker		I	S	M	6	9.00	3.66	0.83	17.50	92.50
Spotted Sucker		I	S	N	5	7.50	3.05	0.19	4.07	25.80
Redfin Shiner		I	N	N	79	118.50	48.17	0.17	3.58	1.44
Striped Shiner		I	S	N	25	37.50	15.24	0.70	14.73	18.68
Silverjaw Minnow		I	M	N	1	1.50	0.61	0.00	0.06	2.00
Bluntnose Minnow		O	C	T	2	3.00	1.22	0.00	0.06	1.00
Yellow Bullhead		I	C	T	6	9.00	3.66	1.39	29.29	154.83
Rock Bass		C	C	N	4	6.00	2.44	0.53	11.04	87.50
Green Sunfish		I	C	T	3	4.50	1.83	0.15	3.22	34.00
Bluegill Sunfish		I	C	P	12	18.00	7.32	0.18	3.82	10.08
Longear Sunfish		I	C	M	5	7.50	3.05	0.15	3.25	20.60
Hybrid x Sunfish				N	1	1.50	0.61	0.08	1.58	50.00
Blackside Darter		I	S	N	7	10.50	4.27	0.03	0.63	2.86
Fantail Darter		I	C	N	4	6.00	2.44	0.01	0.13	1.00
			Data Totals:		164	246.00		4.76		
			Number of Species:		16					
			Number of Hybrids:		1					

River Code:	**09-530-000**	Stream:	**ELK FORK**			Sample Date:	**2016-08-24**
River Mile:	**8.6**	Location:	ELK FORK SW OF PRATTSVILLE @ GRAVEL ROAD DST. WOLF RUN				
Time Fished:	2065 sec	Drainage:	44.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	6	9.00	3.97	0.37	2.65	41.33
Golden Redhorse		I	S	M	34	51.00	22.52	6.64	47.20	130.15
Northern Hog Sucker		I	S	M	16	24.00	10.60	1.84	13.08	76.63
White Sucker		O	S	T	5	7.50	3.31	1.85	13.13	246.20
Spotted Sucker		I	S	N	5	7.50	3.31	0.47	3.31	62.00
Creek Chub		G	N	T	2	3.00	1.32	0.15	1.05	49.00
Redfin Shiner		I	N	N	3	4.50	1.99	0.01	0.04	1.33
Striped Shiner		I	S	N	19	28.50	12.58	0.33	2.35	11.58
Silverjaw Minnow		I	M	N	1	1.50	0.66	0.00	0.02	2.00
Bluntnose Minnow		O	C	T	11	16.50	7.28	0.03	0.20	1.73
Yellow Bullhead		I	C	T	2	3.00	1.32	0.45	3.20	150.00
Brook Silverside		I	M	M	1	1.50	0.66	0.00	0.02	2.00
Rock Bass		C	C	N	2	3.00	1.32	0.31	2.20	103.00
Spotted Bass		C	C	N	6	9.00	3.97	0.62	4.37	68.33
Green Sunfish		I	C	T	5	7.50	3.31	0.26	1.81	34.00
Bluegill Sunfish		I	C	P	7	10.50	4.64	0.17	1.19	16.00
Longear Sunfish		I	C	M	14	21.00	9.27	0.54	3.86	25.86
Blackside Darter		I	S	N	6	9.00	3.97	0.02	0.15	2.33
Logperch		I	S	M	1	1.50	0.66	0.02	0.11	10.00
Johnny Darter		I	C	N	3	4.50	1.99	0.00	0.03	1.00
Fantail Darter		I	C	N	2	3.00	1.32	0.00	0.03	1.50
			Data Totals:		151	226.50		14.06		
			Number of Species:		21					
			Number of Hybrids:		0					

River Code:	**09-530-000**	Stream:	**ELK FORK**			Sample Date:	**2016-07-08**
River Mile:	**8.6**	Location:	ELK FORK SW OF PRATTSVILLE @ GRAVEL ROAD DST. WOLF RUN				
Time Fished:	3055 sec	Drainage:	44.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	4.50	2.59	0.02	1.00	5.33
Redfin Pickerel		P	M	P	5	7.50	4.31	0.07	2.75	8.75
Golden Redhorse		I	S	M	2	3.00	1.72	0.16	6.59	52.50
Northern Hog Sucker		I	S	M	5	7.50	4.31	0.17	7.03	22.40
Redfin Shiner		I	N	N	6	9.00	5.17	0.03	1.36	3.60
Striped Shiner		I	S	N	22	33.00	18.97	0.20	8.29	6.00
Silverjaw Minnow		I	M	N	1	1.50	0.86	0.01	0.38	6.00
Bluntnose Minnow		O	C	T	27	40.50	23.28	0.26	10.68	6.30
Central Stoneroller		H	N	N	1	1.50	0.86	0.00	0.19	3.00
Green Sunfish		I	C	T	10	15.00	8.62	0.19	8.04	12.80
Bluegill Sunfish		I	C	P	3	4.50	2.59	0.18	7.54	40.00
Longear Sunfish		I	C	M	14	21.00	12.07	0.99	41.32	47.00
Hybrid x Sunfish				N	5	7.50	4.31	0.07	3.01	9.60
Dusky Darter		I	S	M	2	3.00	1.72	0.01	0.50	4.00
Blackside Darter		I	S	N	5	7.50	4.31	0.01	0.57	1.80
Logperch		I	S	M	1	1.50	0.86	0.01	0.50	8.00
Fantail Darter		I	C	N	4	6.00	3.45	0.01	0.25	1.00
			Data Totals:		116	174.00		2.39		
			Number of Species:		17					
			Number of Hybrids:		1					

River Code:	**09-530-000**	Stream:	**ELK FORK**			Sample Date:	**2016-08-24**
River Mile:	**0.0**	Location:	ELK FORK NE OF RADCLIFF @ CO. RD. 43B				
Time Fished:	1900 sec	Drainage:	59.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	6	9.00	2.69	0.06	0.75	6.67
Redfin Pickerel		P	M	P	1	1.50	0.45	0.01	0.15	8.00
Golden Redhorse		I	S	M	5	7.50	2.24	0.74	9.35	99.20
Northern Hog Sucker		I	S	M	20	30.00	8.97	0.69	8.71	23.10
Creek Chub		G	N	T	36	54.00	16.14	0.83	10.45	15.39
Striped Shiner		I	S	N	62	93.00	27.80	0.92	11.61	9.93
Bluntnose Minnow		O	C	T	14	21.00	6.28	0.09	1.13	4.29
Central Stoneroller		H	N	N	7	10.50	3.14	0.03	0.40	3.00
Channel Catfish			C	N	1	1.50	0.45	2.40	30.17	1600.00
Yellow Bullhead		I	C	T	1	1.50	0.45	0.27	3.39	180.00
Brook Silverside		I	M	M	1	1.50	0.45	0.00	0.02	1.00
Rock Bass		C	C	N	5	7.50	2.24	0.41	5.17	54.80
Spotted Bass		C	C	N	3	4.50	1.35	0.08	0.94	16.67
Largemouth Bass		C	C	N	1	1.50	0.45	0.36	4.56	242.00
Green Sunfish		I	C	T	16	24.00	7.17	0.52	6.52	21.63
Longear Sunfish		I	C	M	12	18.00	5.38	0.45	5.69	25.17
Dusky Darter		I	S	M	1	1.50	0.45	0.01	0.15	8.00
Blackside Darter		I	S	N	7	10.50	3.14	0.03	0.34	2.57
Johnny Darter		I	C	N	3	4.50	1.35	0.01	0.08	1.33
Banded Darter		I	S	I	7	10.50	3.14	0.01	0.15	1.14
Fantail Darter		I	C	N	14	21.00	6.28	0.02	0.25	0.93
			Data Totals:		223	334.50		7.95		
			Number of Species:		21					
			Number of Hybrids:		0					

River Code:	**09-530-000**	Stream:	**ELK FORK**			Sample Date:	**2016-07-20**
River Mile:	**0.0**	Location:	ELK FORK NE OF RADCLIFF @ CO. RD. 43B				
Time Fished:	2253 sec	Drainage:	59.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	4.50	3.03	0.02	0.87	5.00
Golden Redhorse		I	S	M	2	3.00	2.02	0.68	26.18	225.00
Northern Hog Sucker		I	S	M	10	15.00	10.10	0.32	12.33	21.20
Blacknose Dace		G	S	T	1	1.50	1.01	0.00	0.12	2.00
Creek Chub		G	N	T	9	13.50	9.09	0.18	7.10	13.56
Striped Shiner		I	S	N	30	45.00	30.30	0.27	10.35	5.93
Silverjaw Minnow		I	M	N	2	3.00	2.02	0.01	0.23	2.00
Bluntnose Minnow		O	C	T	4	6.00	4.04	0.02	0.58	2.50
Central Stoneroller		H	N	N	1	1.50	1.01	0.01	0.29	5.00
Yellow Bullhead		I	C	T	1	1.50	1.01	0.02	0.58	10.00
Rock Bass		C	C	N	2	3.00	2.02	0.36	13.85	119.00
Largemouth Bass		C	C	N	3	4.50	3.03	0.51	19.78	113.33
Warmouth Sunfish		C	C	N	1	1.50	1.01	0.04	1.45	25.00
Green Sunfish		I	C	T	2	3.00	2.02	0.05	1.86	16.00
Bluegill Sunfish		I	C	P	1	1.50	1.01	0.01	0.47	8.00
Longear Sunfish		I	C	M	1	1.50	1.01	0.04	1.51	26.00
Hybrid x Sunfish				N	1	1.50	1.01	0.02	0.70	12.00
Dusky Darter		I	S	M	3	4.50	3.03	0.02	0.58	3.33
Johnny Darter		I	C	N	5	7.50	5.05	0.01	0.23	0.80
Banded Darter		I	S	I	5	7.50	5.05	0.01	0.35	1.20
Fantail Darter		I	C	N	12	18.00	12.12	0.02	0.58	0.83
			Data Totals:		99	148.50		2.58		
			Number of Species:		21					
			Number of Hybrids:		1					

River Code:	**09-530-004**	Stream:	**TRIB. TO ELK FORK (RM 11.17)**			Sample Date:	**2016-08-03**
River Mile:	**0.4**	Location:	TRIB. TO ELK FORK (11.17) E OF MCARTHUR @ CO. RD. 7				
Time Fished:	661 sec	Drainage:	2.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.40	1.37	0.00	#Error	0.00
Redfin Pickerel		P	M	P	1	2.40	1.37	0.00	#Error	0.00
White Sucker		O	S	T	2	4.80	2.74	0.00	#Error	0.00
Creek Chub		G	N	T	37	88.80	50.68	0.00	#Error	0.00
Striped Shiner		I	S	N	6	14.40	8.22	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	10	24.00	13.70	0.00	#Error	0.00
Central Stoneroller		H	N	N	2	4.80	2.74	0.00	#Error	0.00
Yellow Bullhead		I	C	T	5	12.00	6.85	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.40	1.37	0.00	#Error	0.00
Green Sunfish		I	C	T	3	7.20	4.11	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.80	2.74	0.00	#Error	0.00
Johnny Darter		I	C	N	3	7.20	4.11	0.00	#Error	0.00
			Data Totals:		73	175.20		0.00		
			Number of Species:		12					
			Number of Hybrids:		0					

River Code:	**09-533-000**	Stream:	**WOLF RUN**			Sample Date:	**2016-06-29**
River Mile:	**3.8**	Location:	WOLF RUN SE OF MCARTHUR @ CO. RD. 24				
Time Fished:	1962 sec	Drainage:	4.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	3	7.20	3.85	0.00	#Error	0.00
Creek Chub		G	N	T	11	26.40	14.10	0.00	#Error	0.00
Striped Shiner		I	S	N	18	43.20	23.08	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.40	1.28	0.00	#Error	0.00
Yellow Bullhead		I	C	T	8	19.20	10.26	0.00	#Error	0.00
Spotted Bass		C	C	N	1	2.40	1.28	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	5	12.00	6.41	0.00	#Error	0.00
Green Sunfish		I	C	T	18	43.20	23.08	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.80	2.56	0.00	#Error	0.00
Longear Sunfish		I	C	M	11	26.40	14.10	0.00	#Error	0.00
			Data Totals:		78	187.20		0.00		
			Number of Species:		10					
			Number of Hybrids:		0					

River Code:	**09-534-000**	Stream:	**PUNCHEON FORK**			Sample Date:	**2016-06-29**
River Mile:	**2.8**	Location:	PUNCHEON FORK UPST. MCARTHUR @ TWP. RD. 20				
Time Fished:	1665 sec	Drainage:	4.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	1	2.00	2.56	0.00	#Error	0.00
Blacknose Dace		G	S	T	1	2.00	2.56	0.00	#Error	0.00
Creek Chub		G	N	T	14	28.00	35.90	0.00	#Error	0.00
Striped Shiner		I	S	N	1	2.00	2.56	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	8	16.00	20.51	0.00	#Error	0.00
Central Stoneroller		H	N	N	8	16.00	20.51	0.00	#Error	0.00
Green Sunfish		I	C	T	4	8.00	10.26	0.00	#Error	0.00
Fantail Darter		I	C	N	2	4.00	5.13	0.00	#Error	0.00
			Data Totals:		39	78.00		0.00		
			Number of Species:		8					
			Number of Hybrids:		0					

River Code:	**09-534-000**	Stream:	**PUNCHEON FORK**			Sample Date:	**2016-06-28**
River Mile:	**1.5**	Location:	PUNCHEON FORK UPST. MCARTHUR WWTP @ CO. RD. 25				
Time Fished:	1800 sec	Drainage:	7.2 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	2	4.00	1.43	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	4	8.00	2.86	0.00	#Error	0.00
White Sucker		O	S	T	4	8.00	2.86	0.00	#Error	0.00
Creek Chub		G	N	T	28	56.00	20.00	0.00	#Error	0.00
Striped Shiner		I	S	N	31	62.00	22.14	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.71	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	15	30.00	10.71	0.00	#Error	0.00
Central Stoneroller		H	N	N	13	26.00	9.29	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	2.14	0.00	#Error	0.00
Rock Bass		C	C	N	1	2.00	0.71	0.00	#Error	0.00
Green Sunfish		I	C	T	18	36.00	12.86	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	7	14.00	5.00	0.00	#Error	0.00
Johnny Darter		I	C	N	4	8.00	2.86	0.00	#Error	0.00
Fantail Darter		I	C	N	9	18.00	6.43	0.00	#Error	0.00
			Data Totals:		140	280.00		0.00		
			Number of Species:		14					
			Number of Hybrids:		0					

River Code:	**09-534-000**	Stream:	**PUNCHEON FORK**			Sample Date:	**2016-06-28**
River Mile:	**0.3**	Location:	PUNCHEON FORK E OF MCARTHUR @ TWP. RD. 11				
Time Fished:	1800 sec	Drainage:	9.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	22	44.00	10.53	0.00	#Error	0.00
White Sucker		O	S	T	4	8.00	1.91	0.00	#Error	0.00
Creek Chub		G	N	T	36	72.00	17.22	0.00	#Error	0.00
Redfin Shiner		I	N	N	2	4.00	0.96	0.00	#Error	0.00
Striped Shiner		I	S	N	54	108.00	25.84	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	21	42.00	10.05	0.00	#Error	0.00
Central Stoneroller		H	N	N	26	52.00	12.44	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	1.44	0.00	#Error	0.00
Green Sunfish		I	C	T	23	46.00	11.00	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.48	0.00	#Error	0.00
Blackside Darter		I	S	N	4	8.00	1.91	0.00	#Error	0.00
Johnny Darter		I	C	N	5	10.00	2.39	0.00	#Error	0.00
Fantail Darter		I	C	N	8	16.00	3.83	0.00	#Error	0.00
			Data Totals:		209	418.00		0.00		
			Number of Species:		13					
			Number of Hybrids:		0					

River Code:	**09-539-000**	Stream:	**INDIAN CREEK**			Sample Date:	**2016-08-30**
River Mile:	**1.6**	Location:	INDIAN CREEK UPST. RIO GRANDE WWTP @ ST. RT. 325				
Time Fished:	1248 sec	Drainage:	10.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	6.00	0.86	0.00	#Error	0.00
Golden Redhorse		I	S	M	8	16.00	2.31	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	14	28.00	4.03	0.00	#Error	0.00
White Sucker		O	S	T	80	160.00	23.05	0.00	#Error	0.00
Creek Chub		G	N	T	34	68.00	9.80	0.00	#Error	0.00
Striped Shiner		I	S	N	39	78.00	11.24	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.29	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	5	10.00	1.44	0.00	#Error	0.00
Central Stoneroller		H	N	N	58	116.00	16.71	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.29	0.00	#Error	0.00
Rock Bass		C	C	N	1	2.00	0.29	0.00	#Error	0.00
Spotted Bass		C	C	N	10	20.00	2.88	0.00	#Error	0.00
Largemouth Bass		C	C	N	7	14.00	2.02	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	1	2.00	0.29	0.00	#Error	0.00
Green Sunfish		I	C	T	13	26.00	3.75	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	35	70.00	10.09	0.00	#Error	0.00
Longear Sunfish		I	C	M	4	8.00	1.15	0.00	#Error	0.00
Redear Sunfish		I	C	N	1	2.00	0.29	0.00	#Error	0.00
Blackside Darter		I	S	N	4	8.00	1.15	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	0.29	0.00	#Error	0.00
Johnny Darter		I	C	N	25	50.00	7.20	0.00	#Error	0.00
Fantail Darter		I	C	N	2	4.00	0.58	0.00	#Error	0.00
			Data Totals:		347	694.00		0.00		
			Number of Species:		22					
			Number of Hybrids:		0					

River Code:	**09-539-000**	Stream:	**INDIAN CREEK**			Sample Date:	**2016-08-02**
River Mile:	**1.6**	Location:	INDIAN CREEK UPST. RIO GRANDE WWTP @ ST. RT. 325				
Time Fished:	2605 sec	Drainage:	10.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.16 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.82	0.21	0.00	#Error	0.00
Golden Redhorse		I	S	M	10	18.18	2.09	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	12	21.82	2.51	0.00	#Error	0.00
White Sucker		O	S	T	147	267.27	30.75	0.00	#Error	0.00
Creek Chub		G	N	T	32	58.18	6.69	0.00	#Error	0.00
Striped Shiner		I	S	N	64	116.36	13.39	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	8	14.55	1.67	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	9	16.36	1.88	0.00	#Error	0.00
Central Stoneroller		H	N	N	87	158.18	18.20	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	1.82	0.21	0.00	#Error	0.00
Western Mosquitofish		I	N	N	1	1.82	0.21	0.00	#Error	0.00
Rock Bass		C	C	N	1	1.82	0.21	0.00	#Error	0.00
Spotted Bass		C	C	N	6	10.91	1.26	0.00	#Error	0.00
Largemouth Bass		C	C	N	2	3.64	0.42	0.00	#Error	0.00
Green Sunfish		I	C	T	14	25.45	2.93	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	27	49.09	5.65	0.00	#Error	0.00
Longear Sunfish		I	C	M	5	9.09	1.05	0.00	#Error	0.00
Hybrid x Sunfish				N	1	1.82	0.21	0.00	#Error	0.00
Blackside Darter		I	S	N	5	9.09	1.05	0.00	#Error	0.00
Johnny Darter		I	C	N	32	58.18	6.69	0.00	#Error	0.00
Fantail Darter		I	C	N	13	23.64	2.72	0.00	#Error	0.00
			Data Totals:		478	869.09		0.00		
			Number of Species:		21					
			Number of Hybrids:		1					

River Code:	**09-539-000**	Stream:	**INDIAN CREEK**			Sample Date:	**2016-08-02**
River Mile:	**1.5**	Location:	INDIAN CREEK DST. RIO GRANDE WWTP, UPST. L. INDIAN CREEK				
Time Fished:	1746 sec	Drainage:	10.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	14	28.00	6.28	0.00	#Error	0.00
White Sucker		O	S	T	22	44.00	9.87	0.00	#Error	0.00
Creek Chub		G	N	T	33	66.00	14.80	0.00	#Error	0.00
Striped Shiner		I	S	N	20	40.00	8.97	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	3	6.00	1.35	0.00	#Error	0.00
Central Stoneroller		H	N	N	65	130.00	29.15	0.00	#Error	0.00
Rock Bass		C	C	N	2	4.00	0.90	0.00	#Error	0.00
Spotted Bass		C	C	N	3	6.00	1.35	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	0.45	0.00	#Error	0.00
Green Sunfish		I	C	T	5	10.00	2.24	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	0.45	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.00	0.90	0.00	#Error	0.00
Blackside Darter		I	S	N	2	4.00	0.90	0.00	#Error	0.00
Johnny Darter		I	C	N	23	46.00	10.31	0.00	#Error	0.00
Fantail Darter		I	C	N	27	54.00	12.11	0.00	#Error	0.00
			Data Totals:		223	446.00		0.00		
			Number of Species:		15					
			Number of Hybrids:		0					

River Code:	**09-539-000**	Stream:	**INDIAN CREEK**			Sample Date:	**2016-07-21**
River Mile:	**1.5**	Location:	INDIAN CREEK DST. RIO GRANDE WWTP, UPST. L. INDIAN CREEK				
Time Fished:	3055 sec	Drainage:	10.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	5	10.00	0.70	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	36	72.00	5.06	0.00	#Error	0.00
White Sucker		O	S	T	81	162.00	11.38	0.00	#Error	0.00
Blacknose Dace		G	S	T	2	4.00	0.28	0.00	#Error	0.00
Creek Chub		G	N	T	137	274.00	19.24	0.00	#Error	0.00
Striped Shiner		I	S	N	130	260.00	18.26	0.00	#Error	0.00
Sand Shiner		I	M	M	5	10.00	0.70	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	36	72.00	5.06	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	38	76.00	5.34	0.00	#Error	0.00
Central Stoneroller		H	N	N	156	312.00	21.91	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.14	0.00	#Error	0.00
Rock Bass		C	C	N	6	12.00	0.84	0.00	#Error	0.00
Spotted Bass		C	C	N	7	14.00	0.98	0.00	#Error	0.00
Largemouth Bass		C	C	N	2	4.00	0.28	0.00	#Error	0.00
Green Sunfish		I	C	T	8	16.00	1.12	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	9	18.00	1.26	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.00	0.14	0.00	#Error	0.00
Blackside Darter		I	S	N	4	8.00	0.56	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	0.14	0.00	#Error	0.00
Johnny Darter		I	C	N	35	70.00	4.92	0.00	#Error	0.00
Fantail Darter		I	C	N	12	24.00	1.69	0.00	#Error	0.00
			Data Totals:		712	1424.00		0.00		
			Number of Species:		21					
			Number of Hybrids:		0					

River Code:	**09-540-000**	Stream:	**LITTLE INDIAN CREEK**			Sample Date:	**2016-06-28**
River Mile:	**0.2**	Location:	L. INDIAN CREEK N OF RIO GRANDE @ ST. RT. 325				
Time Fished:	1753 sec	Drainage:	10.2 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.17	0.00	#Error	0.00
Golden Redhorse		I	S	M	2	3.00	0.35	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	16	24.00	2.78	0.00	#Error	0.00
White Sucker		O	S	T	71	106.50	12.33	0.00	#Error	0.00
Blacknose Dace		G	S	T	4	6.00	0.69	0.00	#Error	0.00
Creek Chub		G	N	T	122	183.00	21.18	0.00	#Error	0.00
Striped Shiner		I	S	N	195	292.50	33.85	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	18	27.00	3.13	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	47	70.50	8.16	0.00	#Error	0.00
Central Stoneroller		H	N	N	12	18.00	2.08	0.00	#Error	0.00
Rock Bass		C	C	N	1	1.50	0.17	0.00	#Error	0.00
Spotted Bass		C	C	N	1	1.50	0.17	0.00	#Error	0.00
Green Sunfish		I	C	T	6	9.00	1.04	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	3.00	0.35	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	3.00	0.35	0.00	#Error	0.00
Blackside Darter		I	S	N	21	31.50	3.65	0.00	#Error	0.00
Johnny Darter		I	C	N	31	46.50	5.38	0.00	#Error	0.00
Fantail Darter		I	C	N	24	36.00	4.17	0.00	#Error	0.00
			Data Totals:		576	864.00		0.00		
			Number of Species:		18					
			Number of Hybrids:		0					

River Code:	**09-544-000**	Stream:	**ROBINSON RUN**			Sample Date:	**2016-08-02**
River Mile:	**0.2**	Location:	ROBINSON RUN N OF VINTON @ ST. RT. 325				
Time Fished:	1669 sec	Drainage:	9.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.16 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	7	12.73	4.22	0.00	#Error	0.00
Redfin Pickerel		P	M	P	8	14.55	4.82	0.00	#Error	0.00
Golden Redhorse		I	S	M	3	5.45	1.81	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	1	1.82	0.60	0.00	#Error	0.00
White Sucker		O	S	T	15	27.27	9.04	0.00	#Error	0.00
Creek Chub		G	N	T	53	96.36	31.93	0.00	#Error	0.00
Striped Shiner		I	S	N	19	34.55	11.45	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	7	12.73	4.22	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	5	9.09	3.01	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	1.82	0.60	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	1.82	0.60	0.00	#Error	0.00
Rock Bass		C	C	N	1	1.82	0.60	0.00	#Error	0.00
Spotted Bass		C	C	N	4	7.27	2.41	0.00	#Error	0.00
Green Sunfish		I	C	T	6	10.91	3.61	0.00	#Error	0.00
Blackside Darter		I	S	N	3	5.45	1.81	0.00	#Error	0.00
Johnny Darter		I	C	N	27	49.09	16.27	0.00	#Error	0.00
Fantail Darter		I	C	N	5	9.09	3.01	0.00	#Error	0.00
			Data Totals:		166	301.82		0.00		
			Number of Species:		17					
			Number of Hybrids:		0					

River Code:	**09-546-000**	Stream:	**STRONGS RUN**			Sample Date:	**2016-07-21**
River Mile:	**5.9**	Location:	STRONGS RUN E OF WILKESVILLE @ TWP. RD. 24				
Time Fished:	1800 sec	Drainage:	5.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	10	20.00	1.93	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	2	4.00	0.39	0.00	#Error	0.00
White Sucker		O	S	T	69	138.00	13.29	0.00	#Error	0.00
Blacknose Dace		G	S	T	1	2.00	0.19	0.00	#Error	0.00
Creek Chub		G	N	T	229	458.00	44.12	0.00	#Error	0.00
Striped Shiner		I	S	N	78	156.00	15.03	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	54	108.00	10.40	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	11	22.00	2.12	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	2.00	0.19	0.00	#Error	0.00
Spotted Bass		C	C	N	3	6.00	0.58	0.00	#Error	0.00
Green Sunfish		I	C	T	6	12.00	1.16	0.00	#Error	0.00
Blackside Darter		I	S	N	8	16.00	1.54	0.00	#Error	0.00
Johnny Darter		I	C	N	42	84.00	8.09	0.00	#Error	0.00
Fantail Darter		I	C	N	5	10.00	0.96	0.00	#Error	0.00
			Data Totals:		519	1038.00		0.00		
			Number of Species:		14					
			Number of Hybrids:		0					

River Code:	**09-546-000**	Stream:	**STRONGS RUN**			Sample Date:	**2016-07-20**
River Mile:	**0.6**	Location:	STRONGS RUN NE OF EWINGTON @ ADNEY RD.				
Time Fished:	1230 sec	Drainage:	16.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	4	8.00	2.44	0.00	#Error	0.00
Golden Redhorse		I	S	M	1	2.00	0.61	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	3	6.00	1.83	0.00	#Error	0.00
White Sucker		O	S	T	13	26.00	7.93	0.00	#Error	0.00
Creek Chub		G	N	T	66	132.00	40.24	0.00	#Error	0.00
Striped Shiner		I	S	N	23	46.00	14.02	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	5	10.00	3.05	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	12	24.00	7.32	0.00	#Error	0.00
Spotted Bass		C	C	N	7	14.00	4.27	0.00	#Error	0.00
Largemouth Bass		C	C	N	2	4.00	1.22	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	0.61	0.00	#Error	0.00
Longear Sunfish		I	C	M	8	16.00	4.88	0.00	#Error	0.00
Dusky Darter		I	S	M	1	2.00	0.61	0.00	#Error	0.00
Blackside Darter		I	S	N	3	6.00	1.83	0.00	#Error	0.00
Johnny Darter		I	C	N	6	12.00	3.66	0.00	#Error	0.00
Fantail Darter		I	C	N	9	18.00	5.49	0.00	#Error	0.00
			Data Totals:		164	328.00		0.00		
			Number of Species:		16					
			Number of Hybrids:		0					

River Code:	**09-547-000**	Stream:	**WILLIAMS RUN**			Sample Date:	**2016-07-21**
River Mile:	**0.1**	Location:	WILLIAMS RUN SE OF WILKESVILLE @ MOUTH				
Time Fished:	1425 sec	Drainage:	3.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	6.00	0.93	0.00	#Error	0.00
White Sucker		O	S	T	32	64.00	9.91	0.00	#Error	0.00
Creek Chub		G	N	T	110	220.00	34.06	0.00	#Error	0.00
Suckermouth Minnow		I	S	N	2	4.00	0.62	0.00	#Error	0.00
Redfin Shiner		I	N	N	1	2.00	0.31	0.00	#Error	0.00
Striped Shiner		I	S	N	90	180.00	27.86	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	15	30.00	4.64	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	9	18.00	2.79	0.00	#Error	0.00
Central Stoneroller		H	N	N	12	24.00	3.72	0.00	#Error	0.00
Spotted Bass		C	C	N	2	4.00	0.62	0.00	#Error	0.00
Green Sunfish		I	C	T	7	14.00	2.17	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.00	0.62	0.00	#Error	0.00
Longear Sunfish		I	C	M	6	12.00	1.86	0.00	#Error	0.00
Blackside Darter		I	S	N	1	2.00	0.31	0.00	#Error	0.00
Johnny Darter		I	C	N	31	62.00	9.60	0.00	#Error	0.00
			Data Totals:		323	646.00		0.00		
			Number of Species:		15					
			Number of Hybrids:		0					

River Code:	**09-549-000**	Stream:	**FLATLICK RUN**			Sample Date:	**2016-07-21**
River Mile:	**0.6**	Location:	FLATLICK RUN S OF WILKESVILLE @ NEWSOME RD. (CO. RD. 8)				
Time Fished:	1500 sec	Drainage:	7.2 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	5	10.00	1.57	0.00	#Error	0.00
Redfin Pickerel		P	M	P	1	2.00	0.31	0.00	#Error	0.00
Golden Redhorse		I	S	M	1	2.00	0.31	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	3	6.00	0.94	0.00	#Error	0.00
White Sucker		O	S	T	82	164.00	25.71	0.00	#Error	0.00
Golden Shiner		I	M	T	1	2.00	0.31	0.00	#Error	0.00
Creek Chub		G	N	T	106	212.00	33.23	0.00	#Error	0.00
Striped Shiner		I	S	N	17	34.00	5.33	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	18	36.00	5.64	0.00	#Error	0.00
Central Stoneroller		H	N	N	2	4.00	0.63	0.00	#Error	0.00
Yellow Bullhead		I	C	T	5	10.00	1.57	0.00	#Error	0.00
Spotted Bass		C	C	N	6	12.00	1.88	0.00	#Error	0.00
Green Sunfish		I	C	T	34	68.00	10.66	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	19	38.00	5.96	0.00	#Error	0.00
Longear Sunfish		I	C	M	5	10.00	1.57	0.00	#Error	0.00
Blackside Darter		I	S	N	4	8.00	1.25	0.00	#Error	0.00
Johnny Darter		I	C	N	4	8.00	1.25	0.00	#Error	0.00
Fantail Darter		I	C	N	6	12.00	1.88	0.00	#Error	0.00
			Data Totals:		319	638.00		0.00		
			Number of Species:		18					
			Number of Hybrids:		0					

River Code:	**09-551-000**	Stream:	**INDIANCAMP RUN**			Sample Date:	**2016-07-27**
River Mile:	**0.3**	Location:	INDIANCAMP RUN SW OF CLARION, ADJ. CO. RD. 26				
Time Fished:	1502 sec	Drainage:	2.1 sq mi	Depth:		Data Source:	
Dist Fished:	0.14 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	5	11.11	4.31	0.00	#Error	0.00
White Sucker		O	S	T	11	24.44	9.48	0.00	#Error	0.00
Creek Chub		G	N	T	56	124.44	48.28	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	1	2.22	0.86	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	2.22	0.86	0.00	#Error	0.00
Yellow Bullhead		I	C	T	2	4.44	1.72	0.00	#Error	0.00
Green Sunfish		I	C	T	28	62.22	24.14	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.22	0.86	0.00	#Error	0.00
Fantail Darter		I	C	N	11	24.44	9.48	0.00	#Error	0.00
			Data Totals:		116	257.78		0.00		
			Number of Species:		9					
			Number of Hybrids:		0					

River Code:	**09-552-000**	Stream:	**ROCKCAMP RUN**			Sample Date:	**2016-08-02**
River Mile:	**0.1**	Location:	ROCKCAMP RUN NEAR HAWKS @ OLD RR NEAR MOUTH				
Time Fished:	1019 sec	Drainage:	2.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	2	4.80	25.00	0.00	#Error	0.00
Green Sunfish		I	C	T	6	14.40	75.00	0.00	#Error	0.00
			Data Totals:		8	19.20		0.00		
			Number of Species:		2					
			Number of Hybrids:		0					

River Code:	**09-553-000**	Stream:	**PIERCE RUN**			Sample Date:	**2016-06-29**
River Mile:	**5.5**	Location:	PIERCE RUN W OF ORETON, DST. GOB PILE 82001305				
Time Fished:	1826 sec	Drainage:	3.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Northern Hog Sucker		I	S	M	1	2.00	1.37	0.00	#Error	0.00
Creek Chub		G	N	T	51	102.00	69.86	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	3	6.00	4.11	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	2.00	1.37	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	1.37	0.00	#Error	0.00
Green Sunfish		I	C	T	15	30.00	20.55	0.00	#Error	0.00
Redear Sunfish		I	C	N	1	2.00	1.37	0.00	#Error	0.00
			Data Totals:		73	146.00		0.00		
			Number of Species:		7					
			Number of Hybrids:		0					

River Code:	**09-553-000**	Stream:	**PIERCE RUN**			Sample Date:	**2016-06-29**
River Mile:	**1.7**	Location:	PIERCE RUN AT RADCLIFF @ TWP. RD. 2				
Time Fished:	1359 sec	Drainage:	9.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	4	9.60	5.26	0.00	#Error	0.00
Golden Redhorse		I	S	M	1	2.40	1.32	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	2	4.80	2.63	0.00	#Error	0.00
White Sucker		O	S	T	9	21.60	11.84	0.00	#Error	0.00
Creek Chub		G	N	T	9	21.60	11.84	0.00	#Error	0.00
Striped Shiner		I	S	N	15	36.00	19.74	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	2	4.80	2.63	0.00	#Error	0.00
Yellow Bullhead		I	C	T	2	4.80	2.63	0.00	#Error	0.00
Black Bullhead		I	C	P	1	2.40	1.32	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	2	4.80	2.63	0.00	#Error	0.00
Green Sunfish		I	C	T	18	43.20	23.68	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	7.20	3.95	0.00	#Error	0.00
Longear Sunfish		I	C	M	7	16.80	9.21	0.00	#Error	0.00
Blackside Darter		I	S	N	1	2.40	1.32	0.00	#Error	0.00
			Data Totals:		76	182.40		0.00		
			Number of Species:		14					
			Number of Hybrids:		0					

River Code:	**09-556-000**	Stream:	**LONG RUN**			Sample Date:	**2016-08-22**
River Mile:	**1.4**	Location:	LONG RUN N OF VALES MILLS, ADJ CO. RD. 11K				
Time Fished:	1056 sec	Drainage:	2.2 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	11	22.00	7.53	0.00	#Error	0.00
Golden Shiner		I	M	T	3	6.00	2.05	0.00	#Error	0.00
Blacknose Dace		G	S	T	15	30.00	10.27	0.00	#Error	0.00
Creek Chub		G	N	T	67	134.00	45.89	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	13	26.00	8.90	0.00	#Error	0.00
Striped Shiner		I	S	N	2	4.00	1.37	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	4	8.00	2.74	0.00	#Error	0.00
Central Stoneroller		H	N	N	4	8.00	2.74	0.00	#Error	0.00
Green Sunfish		I	C	T	18	36.00	12.33	0.00	#Error	0.00
Johnny Darter		I	C	N	7	14.00	4.79	0.00	#Error	0.00
Fantail Darter		I	C	N	2	4.00	1.37	0.00	#Error	0.00
			Data Totals:		146	292.00		0.00		
			Number of Species:		11					
			Number of Hybrids:		0					

River Code:	**09-557-000**	Stream:	**FLAT RUN**			Sample Date:	**2016-07-27**
River Mile:	**1.6**	Location:	FLAT RUN SE OF BOLINS MILLS @ U.S. RT. 50				
Time Fished:	1800 sec	Drainage:	4.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	3	6.00	1.42	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	1	2.00	0.47	0.00	#Error	0.00
White Sucker		O	S	T	29	58.00	13.74	0.00	#Error	0.00
Creek Chub		G	N	T	23	46.00	10.90	0.00	#Error	0.00
Redfin Shiner		I	N	N	1	2.00	0.47	0.00	#Error	0.00
Striped Shiner		I	S	N	34	68.00	16.11	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	3	6.00	1.42	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	35	70.00	16.59	0.00	#Error	0.00
Central Stoneroller		H	N	N	2	4.00	0.95	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.47	0.00	#Error	0.00
Spotted Bass		C	C	N	5	10.00	2.37	0.00	#Error	0.00
Largemouth Bass		C	C	N	2	4.00	0.95	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	2	4.00	0.95	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	0.47	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	12	24.00	5.69	0.00	#Error	0.00
Longear Sunfish		I	C	M	40	80.00	18.96	0.00	#Error	0.00
Johnny Darter		I	C	N	6	12.00	2.84	0.00	#Error	0.00
Fantail Darter		I	C	N	11	22.00	5.21	0.00	#Error	0.00
			Data Totals:		211	422.00		0.00		
			Number of Species:		18					
			Number of Hybrids:		0					

River Code:	**09-561-000**	Stream:	**ONION CREEK**			Sample Date:	**2016-06-29**
River Mile:	**1.4**	Location:	ONION CREEK SE OF KNOX @ CO. RD. 4				
Time Fished:	1800 sec	Drainage:	8.3 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	0.76	0.00	#Error	0.00
Redfin Pickerel		P	M	P	3	6.00	2.29	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	2	4.00	1.53	0.00	#Error	0.00
White Sucker		O	S	T	3	6.00	2.29	0.00	#Error	0.00
Creek Chub		G	N	T	24	48.00	18.32	0.00	#Error	0.00
Redfin Shiner		I	N	N	2	4.00	1.53	0.00	#Error	0.00
Striped Shiner		I	S	N	40	80.00	30.53	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	0.76	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	20	40.00	15.27	0.00	#Error	0.00
Yellow Bullhead		I	C	T	4	8.00	3.05	0.00	#Error	0.00
Rock Bass		C	C	N	1	2.00	0.76	0.00	#Error	0.00
Spotted Bass		C	C	N	1	2.00	0.76	0.00	#Error	0.00
Largemouth Bass		C	C	N	5	10.00	3.82	0.00	#Error	0.00
Green Sunfish		I	C	T	2	4.00	1.53	0.00	#Error	0.00
Longear Sunfish		I	C	M	19	38.00	14.50	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.00	0.76	0.00	#Error	0.00
Fantail Darter		I	C	N	2	4.00	1.53	0.00	#Error	0.00
			Data Totals:		131	262.00		0.00		
			Number of Species:		17					
			Number of Hybrids:		0					

River Code:	**09-562-000**	Stream:	**LAUREL RUN**			Sample Date:	**2016-08-04**
River Mile:	**0.2**	Location:	LAUREL RUN NEAR KNOX @ TWP. RD. 18				
Time Fished:	1118 sec	Drainage:	2.6 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	2	4.80	1.35	0.00	#Error	0.00
Redfin Pickerel		P	M	P	1	2.40	0.68	0.00	#Error	0.00
White Sucker		O	S	T	9	21.60	6.08	0.00	#Error	0.00
Golden Shiner		I	M	T	1	2.40	0.68	0.00	#Error	0.00
Creek Chub		G	N	T	64	153.60	43.24	0.00	#Error	0.00
Striped Shiner		I	S	N	16	38.40	10.81	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	2	4.80	1.35	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	37	88.80	25.00	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	2.40	0.68	0.00	#Error	0.00
Yellow Bullhead		I	C	T	4	9.60	2.70	0.00	#Error	0.00
Spotted Bass		C	C	N	3	7.20	2.03	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	1	2.40	0.68	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.40	0.68	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.40	0.68	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.80	1.35	0.00	#Error	0.00
Blackside Darter		I	S	N	1	2.40	0.68	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.40	0.68	0.00	#Error	0.00
Fantail Darter		I	C	N	1	2.40	0.68	0.00	#Error	0.00
			Data Totals:		148	355.20		0.00		
			Number of Species:		18					
			Number of Hybrids:		0					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2017-07-06**
River Mile:	**13.1**	Location:	HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD.				
Time Fished:	2400 sec	Drainage:	8.3 sq mi	Depth:		Data Source:	
Dist Fished:	0.18 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	6	10.29	7.14	0.00	#Error	0.00
White Sucker		O	S	T	1	1.71	1.19	0.00	#Error	0.00
Creek Chub		G	N	T	4	6.86	4.76	0.00	#Error	0.00
Striped Shiner		I	S	N	6	10.29	7.14	0.00	#Error	0.00
Yellow Bullhead		I	C	T	8	13.71	9.52	0.00	#Error	0.00
Spotted Bass		C	C	N	1	1.71	1.19	0.00	#Error	0.00
Green Sunfish		I	C	T	19	32.57	22.62	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	7	12.00	8.33	0.00	#Error	0.00
Longear Sunfish		I	C	M	30	51.43	35.71	0.00	#Error	0.00
Blackside Darter		I	S	N	2	3.43	2.38	0.00	#Error	0.00
			Data Totals:		84	144.00		0.00		
			Number of Species:		10					
			Number of Hybrids:		0					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2016-06-27**
River Mile:	**13.1**	Location:	HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD.				
Time Fished:	1743 sec	Drainage:	8.3 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	8	16.00	9.41	0.00	#Error	0.00
White Sucker		O	S	T	2	4.00	2.35	0.00	#Error	0.00
Creek Chub		G	N	T	16	32.00	18.82	0.00	#Error	0.00
Striped Shiner		I	S	N	9	18.00	10.59	0.00	#Error	0.00
Spotted Bass		C	C	N	2	4.00	2.35	0.00	#Error	0.00
Green Sunfish		I	C	T	15	30.00	17.65	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	1	2.00	1.18	0.00	#Error	0.00
Longear Sunfish		I	C	M	28	56.00	32.94	0.00	#Error	0.00
Johnny Darter		I	C	N	4	8.00	4.71	0.00	#Error	0.00
			Data Totals:		85	170.00		0.00		
			Number of Species:		9					
			Number of Hybrids:		0					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2017-07-06**
River Mile:	**8.4**	Location:	Hewett Fork Adj. Waterloo Aquatic Center				
Time Fished:	2700 sec	Drainage:	16.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	1.23	0.00	#Error	0.00
Redfin Pickerel		P	M	P	5	10.00	6.17	0.00	#Error	0.00
Northern Hog Sucker		I	S	M	2	4.00	2.47	0.00	#Error	0.00
White Sucker		O	S	T	4	8.00	4.94	0.00	#Error	0.00
Creek Chub		G	N	T	30	60.00	37.04	0.00	#Error	0.00
Striped Shiner		I	S	N	7	14.00	8.64	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	1.23	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	4	8.00	4.94	0.00	#Error	0.00
Yellow Bullhead		I	C	T	3	6.00	3.70	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	1.23	0.00	#Error	0.00
Green Sunfish		I	C	T	8	16.00	9.88	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	4	8.00	4.94	0.00	#Error	0.00
Longear Sunfish		I	C	M	2	4.00	2.47	0.00	#Error	0.00
Hybrid x Sunfish				N	2	4.00	2.47	0.00	#Error	0.00
Blackside Darter		I	S	N	2	4.00	2.47	0.00	#Error	0.00
Logperch		I	S	M	1	2.00	1.23	0.00	#Error	0.00
Johnny Darter		I	C	N	3	6.00	3.70	0.00	#Error	0.00
Fantail Darter		I	C	N	1	2.00	1.23	0.00	#Error	0.00
			Data Totals:		81	162.00		0.00		
			Number of Species:		18					
			Number of Hybrids:		1					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2016-06-27**
River Mile:	**8.4**	Location:	Hewett Fork Adj. Waterloo Aquatic Center				
Time Fished:	1800 sec	Drainage:	16.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	2.50	0.00	#Error	0.00
Redfin Pickerel		P	M	P	2	4.00	5.00	0.00	#Error	0.00
White Sucker		O	S	T	2	4.00	5.00	0.00	#Error	0.00
Creek Chub		G	N	T	13	26.00	32.50	0.00	#Error	0.00
Silverjaw Minnow		I	M	N	1	2.00	2.50	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	8	16.00	20.00	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.00	2.50	0.00	#Error	0.00
Blackside Darter		I	S	N	3	6.00	7.50	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.00	2.50	0.00	#Error	0.00
Fantail Darter		I	C	N	8	16.00	20.00	0.00	#Error	0.00
			Data Totals:		40	80.00		0.00		
			Number of Species:		10					
			Number of Hybrids:		0					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2017-09-06**
River Mile:	**4.3**	Location:	HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20				
Time Fished:	2477 sec	Drainage:	28.1 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	2	3.00	1.16	0.03	0.60	9.00
Northern Hog Sucker		I	S	M	5	7.50	2.89	0.15	3.34	20.00
Creek Chub		G	N	T	10	15.00	5.78	0.45	10.03	30.00
Redfin Shiner		I	N	N	2	3.00	1.16	0.01	0.13	2.00
Striped Shiner		I	S	N	43	64.50	24.86	0.92	20.56	14.30
Bluntnose Minnow		O	C	T	65	97.50	37.57	0.29	6.35	2.92
Central Stoneroller		H	N	N	6	9.00	3.47	0.10	2.27	11.33
Rock Bass		C	C	N	5	7.50	2.89	0.72	16.05	96.00
Spotted Bass		C	C	N	3	4.50	1.73	0.51	11.43	114.00
Largemouth Bass		C	C	N	4	6.00	2.31	0.75	16.71	125.00
Warmouth Sunfish		C	C	N	1	1.50	0.58	0.05	1.07	32.00
Green Sunfish		I	C	T	5	7.50	2.89	0.08	1.67	10.00
Longear Sunfish		I	C	M	11	16.50	6.36	0.40	9.01	24.50
Blackside Darter		I	S	N	3	4.50	1.73	0.02	0.33	3.33
Johnny Darter		I	C	N	2	3.00	1.16	0.00	0.07	1.00
Banded Darter		I	S	I	1	1.50	0.58	0.00	0.03	1.00
Fantail Darter		I	C	N	5	7.50	2.89	0.02	0.33	2.00
			Data Totals:		173	259.50		4.49		
			Number of Species:		17					
			Number of Hybrids:		0					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2016-08-15**
River Mile:	**4.3**	Location:	HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20				
Time Fished:	2765 sec	Drainage:	28.1 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	1.50	0.75	0.01	0.33	8.00
Redfin Pickerel		P	M	P	2	3.00	1.49	0.03	0.74	9.00
Northern Hog Sucker		I	S	M	8	12.00	5.97	0.44	12.08	36.50
Creek Chub		G	N	T	31	46.50	23.13	1.05	28.95	22.58
Striped Shiner		I	S	N	35	52.50	26.12	0.71	19.60	13.54
Bluntnose Minnow		O	C	T	19	28.50	14.18	0.06	1.74	2.21
Brook Silverside		I	M	M	1	1.50	0.75	0.00	0.08	2.00
Rock Bass		C	C	N	4	6.00	2.99	0.44	12.08	73.00
Spotted Bass		C	C	N	1	1.50	0.75	0.01	0.25	6.00
Largemouth Bass		C	C	N	1	1.50	0.75	0.26	7.11	172.00
Warmouth Sunfish		C	C	N	1	1.50	0.75	0.06	1.65	40.00
Green Sunfish		I	C	T	4	6.00	2.99	0.08	2.32	14.00
Longear Sunfish		I	C	M	11	16.50	8.21	0.42	11.58	25.45
Dusky Darter		I	S	M	3	4.50	2.24	0.03	0.74	6.00
Johnny Darter		I	C	N	4	6.00	2.99	0.01	0.25	1.50
Fantail Darter		I	C	N	8	12.00	5.97	0.02	0.50	1.50
			Data Totals:		134	201.00		3.63		
			Number of Species:		16					
			Number of Hybrids:		0					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2017-07-05**
River Mile:	**0.0**	Location:	HEWETT FORK SE OF LAKE HOPE @ MOUTH				
Time Fished:	2580 sec	Drainage:	40.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	5	7.50	2.26	0.06	0.81	7.60
Redfin Pickerel		P	M	P	1	1.50	0.45	0.02	0.21	10.00
Golden Redhorse		I	S	M	6	9.00	2.71	1.38	19.50	153.33
Northern Hog Sucker		I	S	M	6	9.00	2.71	1.01	14.31	112.50
Creek Chub		G	N	T	3	4.50	1.36	0.12	1.65	26.00
Scarlet Shiner		I	S	M	5	7.50	2.26	0.01	0.17	1.60
Striped Shiner		I	S	N	19	28.50	8.60	0.33	4.66	11.58
Silverjaw Minnow		I	M	N	3	4.50	1.36	0.01	0.17	2.67
Bluntnose Minnow		O	C	T	45	67.50	20.36	0.11	1.53	1.60
Central Stoneroller		H	N	N	2	3.00	0.90	0.00	0.04	1.00
Rock Bass		C	C	N	9	13.50	4.07	0.98	13.91	72.89
Spotted Bass		C	C	N	7	10.50	3.17	0.50	7.02	47.29
Largemouth Bass		C	C	N	4	6.00	1.81	0.15	2.16	25.50
Warmouth Sunfish		C	C	N	4	6.00	1.81	0.11	1.48	17.50
Green Sunfish		I	C	T	6	9.00	2.71	0.19	2.71	21.33
Bluegill Sunfish		I	C	P	1	1.50	0.45	0.01	0.11	5.00
Longear Sunfish		I	C	M	54	81.00	24.43	1.88	26.61	23.24
Pumpkinseed Sunfish		I	C	P	5	7.50	2.26	0.05	0.74	7.00
Hybrid x Sunfish				N	1	1.50	0.45	0.03	0.38	18.00
Dusky Darter		I	S	M	2	3.00	0.90	0.02	0.21	5.00
Blackside Darter		I	S	N	7	10.50	3.17	0.03	0.42	2.86
Logperch		I	S	M	3	4.50	1.36	0.05	0.68	10.67
Johnny Darter		I	C	N	9	13.50	4.07	0.01	0.17	0.89
Banded Darter		I	S	I	4	6.00	1.81	0.01	0.17	2.00
Fantail Darter		I	C	N	10	15.00	4.52	0.01	0.17	0.80
			Data Totals:		221	331.50		7.08		
			Number of Species:		25					
			Number of Hybrids:		1					

River Code:	**09-563-000**	Stream:	**HEWETT FORK**			Sample Date:	**2016-09-12**
River Mile:	**0.0**	Location:	HEWETT FORK SE OF LAKE HOPE @ MOUTH				
Time Fished:	2727 sec	Drainage:	40.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	D

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	8	12.00	3.33	0.08	0.71	6.25
Redfin Pickerel		P	M	P	4	6.00	1.67	0.21	2.01	35.50
Golden Redhorse		I	S	M	10	15.00	4.17	1.67	15.76	111.11
Northern Hog Sucker		I	S	M	18	27.00	7.50	2.18	20.56	80.56
White Sucker		O	S	T	2	3.00	0.83	0.15	1.45	51.00
Creek Chub		G	N	T	8	12.00	3.33	0.41	3.91	34.50
Striped Shiner		I	S	N	42	63.00	17.50	0.68	6.38	10.71
Bluntnose Minnow		O	C	T	30	45.00	12.50	0.11	1.09	2.55
Central Stoneroller		H	N	N	4	6.00	1.67	0.09	0.81	14.25
Yellow Bullhead		I	C	T	2	3.00	0.83	0.83	7.80	275.00
Brook Silverside		I	M	M	2	3.00	0.83	0.00	0.03	1.00
Rock Bass		C	C	N	7	10.50	2.92	0.65	6.10	61.43
Spotted Bass		C	C	N	12	18.00	5.00	1.48	14.02	82.42
Largemouth Bass		C	C	N	2	3.00	0.83	0.38	3.54	125.00
Warmouth Sunfish		C	C	N	2	3.00	0.83	0.08	0.79	28.00
Green Sunfish		I	C	T	4	6.00	1.67	0.09	0.81	14.25
Longear Sunfish		I	C	M	39	58.50	16.25	1.26	11.93	21.58
Hybrid x Sunfish				N	2	3.00	0.83	0.11	1.05	37.00
Dusky Darter		I	S	M	5	7.50	2.08	0.04	0.40	5.60
Blackside Darter		I	S	N	13	19.50	5.42	0.03	0.33	1.77
Logperch		I	S	M	3	4.50	1.25	0.03	0.28	6.67
Johnny Darter		I	C	N	16	24.00	6.67	0.02	0.16	0.69
Banded Darter		I	S	I	3	4.50	1.25	0.00	0.04	1.00
Fantail Darter		I	C	N	2	3.00	0.83	0.00	0.04	1.50
			Data Totals:		240	360.00		10.58		
			Number of Species:		24					
			Number of Hybrids:		1					

River Code:	**09-564-000**	Stream:	**ROCKCAMP CREEK**			Sample Date:	**2016-07-19**
River Mile:	**1.5**	Location:	ROCKCAMP CREEK S OF MINERAL @ ST. RT. 356				
Time Fished:	1468 sec	Drainage:	5.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	1.09	0.00	#Error	0.00
Redfin Pickerel		P	M	P	4	8.00	4.35	0.00	#Error	0.00
White Sucker		O	S	T	4	8.00	4.35	0.00	#Error	0.00
Creek Chub		G	N	T	38	76.00	41.30	0.00	#Error	0.00
Striped Shiner		I	S	N	14	28.00	15.22	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	11	22.00	11.96	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	1.09	0.00	#Error	0.00
Longear Sunfish		I	C	M	4	8.00	4.35	0.00	#Error	0.00
Johnny Darter		I	C	N	6	12.00	6.52	0.00	#Error	0.00
Fantail Darter		I	C	N	9	18.00	9.78	0.00	#Error	0.00
			Data Totals:		92	184.00		0.00		
			Number of Species:		10					
			Number of Hybrids:		0					

River Code:	**09-565-000**	Stream:	**COAL RUN**			Sample Date:	**2016-08-22**
River Mile:	**0.1**	Location:	COAL RUN SE OF MINERAL @ ST. RT. 681				
Time Fished:	460 sec	Drainage:	0.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	5	12.00	5.95	0.00	#Error	0.00
Creek Chub		G	N	T	76	182.40	90.48	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.40	1.19	0.00	#Error	0.00
Blackside Darter		I	S	N	2	4.80	2.38	0.00	#Error	0.00
			Data Totals:		84	201.60		0.00		
			Number of Species:		4					
			Number of Hybrids:		0					

River Code:	**09-566-000**	Stream:	**PINE RUN**			Sample Date:	**2016-09-19**
River Mile:	**0.1**	Location:	PINE RUN NW OF MINERAL @ MOUTH				
Time Fished:	668 sec	Drainage:	2.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	F

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	4	9.60	19.05	0.00	#Error	0.00
White Sucker		O	S	T	1	2.40	4.76	0.00	#Error	0.00
Golden Shiner		I	M	T	2	4.80	9.52	0.00	#Error	0.00
Largemouth Bass		C	C	N	6	14.40	28.57	0.00	#Error	0.00
Green Sunfish		I	C	T	6	14.40	28.57	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	2	4.80	9.52	0.00	#Error	0.00
			Data Totals:		21	50.40		0.00		
			Number of Species:		6					
			Number of Hybrids:		0					

River Code:	**09-567-000**	Stream:	**GRASS RUN**			Sample Date:	**2016-06-27**
River Mile:	**0.0**	Location:	GRASS RUN N OF MINERAL @ ST. RT. 356				
Time Fished:	1800 sec	Drainage:	2.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.12 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	7	16.80	18.92	0.00	#Error	0.00
White Sucker		O	S	T	2	4.80	5.41	0.00	#Error	0.00
Creek Chub		G	N	T	24	57.60	64.86	0.00	#Error	0.00
Hybrid x Sunfish				N	1	2.40	2.70	0.00	#Error	0.00
Johnny Darter		I	C	N	3	7.20	8.11	0.00	#Error	0.00
			Data Totals:		37	88.80		0.00		
			Number of Species:		5					
			Number of Hybrids:		1					

River Code:	**09-568-000**	Stream:	**SANDY RUN**			Sample Date:	**2016-06-27**
River Mile:	**2.7**	Location:	SANDY RUN UPST. LAKE HOPE @ KING HOLLOW TRAIL				
Time Fished:	1100 sec	Drainage:	5.0 sq mi	Depth:		Data Source:	
Dist Fished:	0.18 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	5.14	1.02	0.00	#Error	0.00
White Sucker		O	S	T	36	61.71	12.24	0.00	#Error	0.00
Blacknose Dace		G	S	T	2	3.43	0.68	0.00	#Error	0.00
Creek Chub		G	N	T	202	346.29	68.71	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	10	17.14	3.40	0.00	#Error	0.00
Striped Shiner		I	S	N	24	41.14	8.16	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	1.71	0.34	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	1.71	0.34	0.00	#Error	0.00
Johnny Darter		I	C	N	15	25.71	5.10	0.00	#Error	0.00
			Data Totals:		294	504.00		0.00		
			Number of Species:		9					
			Number of Hybrids:		0					

River Code:	**09-569-000**	Stream:	**LITTLE SANDY RUN**			Sample Date:	**2016-09-20**
River Mile:	**0.4**	Location:	LITTLE SANDY RUN AT ST. RT. 278 SOUTH OF LAKE HOPE				
Time Fished:	854 sec	Drainage:	1.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	F

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Redfin Pickerel		P	M	P	14	28.00	22.58	0.00	#Error	0.00
White Sucker		O	S	T	13	26.00	20.97	0.00	#Error	0.00
Golden Shiner		I	M	T	11	22.00	17.74	0.00	#Error	0.00
Creek Chub		G	N	T	3	6.00	4.84	0.00	#Error	0.00
Yellow Bullhead		I	C	T	9	18.00	14.52	0.00	#Error	0.00
Black Bullhead		I	C	P	2	4.00	3.23	0.00	#Error	0.00
Largemouth Bass		C	C	N	1	2.00	1.61	0.00	#Error	0.00
Warmouth Sunfish		C	C	N	3	6.00	4.84	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	2.00	1.61	0.00	#Error	0.00
Redear Sunfish		I	C	N	3	6.00	4.84	0.00	#Error	0.00
Hybrid x Sunfish				N	2	4.00	3.23	0.00	#Error	0.00
			Data Totals:		62	124.00		0.00		
			Number of Species:		11					
			Number of Hybrids:		1					

River Code:	**09-571-000**	Stream:	**BRUSHY FORK**			Sample Date:	**2016-08-25**
River Mile:	**6.9**	Location:	BRUSHY CREEK 2.7 MI. N OF CREOLA @ GRAVEL LANE OFF S.R. 93				
Time Fished:	1200 sec	Drainage:	8.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	12	24.00	100.00	0.00	#Error	0.00
			Data Totals:		12	24.00		0.00		
			Number of Species:		1					
			Number of Hybrids:		0					

River Code:	**09-571-000**	Stream:	**BRUSHY FORK**			Sample Date:	**2016-08-22**
River Mile:	**0.4**	Location:	BRUSHY CREEK @ SR 328 NEAR MOUTH				
Time Fished:	2265 sec	Drainage:	33.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	12	18.00	4.84	0.12	3.89	6.67
Redfin Pickerel		P	M	P	8	12.00	3.23	0.26	8.36	21.50
Golden Redhorse		I	S	M	1	1.50	0.40	0.01	0.24	5.00
Northern Hog Sucker		I	S	M	5	7.50	2.02	0.03	0.87	3.60
White Sucker		O	S	T	3	4.50	1.21	0.72	23.23	159.33
Creek Chub		G	N	T	55	82.50	22.18	0.66	21.28	7.96
Striped Shiner		I	S	N	91	136.50	36.69	0.51	16.52	3.74
Silverjaw Minnow		I	M	N	8	12.00	3.23	0.02	0.68	1.75
Bluntnose Minnow		O	C	T	32	48.00	12.90	0.09	3.01	1.94
Green Sunfish		I	C	T	2	3.00	0.81	0.03	0.97	10.00
Bluegill Sunfish		I	C	P	6	9.00	2.42	0.22	7.00	24.00
Longear Sunfish		I	C	M	8	12.00	3.23	0.28	9.04	23.25
Hybrid x Sunfish				N	2	3.00	0.81	0.12	3.98	41.00
Blackside Darter		I	S	N	2	3.00	0.81	0.01	0.29	3.00
Johnny Darter		I	C	N	12	18.00	4.84	0.02	0.58	1.00
Fantail Darter		I	C	N	1	1.50	0.40	0.00	0.05	1.00
			Data Totals:		248	372.00		3.09		
			Number of Species:		16					
			Number of Hybrids:		1					

River Code:	**09-571-000**	Stream:	**BRUSHY FORK**			Sample Date:	**2016-07-20**
River Mile:	**0.4**	Location:	BRUSHY CREEK @ SR 328 NEAR MOUTH				
Time Fished:	3070 sec	Drainage:	33.4 sq mi	Depth:		Data Source:	
Dist Fished:	0.2 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	14	21.00	14.00	0.13	12.77	6.20
Redfin Pickerel		P	M	P	7	10.50	7.00	0.11	10.74	10.43
Creek Chub		G	N	T	36	54.00	36.00	0.35	34.57	6.53
Redfin Shiner		I	N	N	2	3.00	2.00	0.01	0.88	3.00
Striped Shiner		I	S	N	20	30.00	20.00	0.10	9.41	3.20
Silverjaw Minnow		I	M	N	1	1.50	1.00	0.01	0.59	4.00
Bluntnose Minnow		O	C	T	2	3.00	2.00	0.01	0.88	3.00
Spotted Bass		C	C	N	1	1.50	1.00	0.01	0.59	4.00
Largemouth Bass		C	C	N	2	3.00	2.00	0.01	1.18	4.00
Green Sunfish		I	C	T	4	6.00	4.00	0.06	5.88	10.00
Longear Sunfish		I	C	M	1	1.50	1.00	0.06	6.18	42.00
Redear Sunfish		I	C	N	2	3.00	2.00	0.06	6.18	21.00
Hybrid x Sunfish				N	2	3.00	2.00	0.09	8.83	30.00
Johnny Darter		I	C	N	2	3.00	2.00	0.00	0.44	1.50
Fantail Darter		I	C	N	4	6.00	4.00	0.01	0.88	1.50
			Data Totals:		100	150.00		1.02		
			Number of Species:		15					
			Number of Hybrids:		1					

River Code:	**09-571-002**	Stream:	**SIVERLY CREEK**			Sample Date:	**2016-07-27**
River Mile:	**0.3**	Location:	SIVERLY CREEK N OF CREOLA @ LANE NEAR MOUTH				
Time Fished:	1500 sec	Drainage:	10.1 sq mi	Depth:		Data Source:	
Dist Fished:	0.16 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	27	49.09	15.61	0.00	#Error	0.00
Blacknose Dace		G	S	T	1	1.82	0.58	0.00	#Error	0.00
Creek Chub		G	N	T	71	129.09	41.04	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	21	38.18	12.14	0.00	#Error	0.00
Redside Dace		I	S	I	11	20.00	6.36	0.00	#Error	0.00
Striped Shiner		I	S	N	10	18.18	5.78	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	3	5.45	1.73	0.00	#Error	0.00
Green Sunfish		I	C	T	2	3.64	1.16	0.00	#Error	0.00
Longear Sunfish		I	C	M	1	1.82	0.58	0.00	#Error	0.00
Blackside Darter		I	S	N	1	1.82	0.58	0.00	#Error	0.00
Rainbow Darter		I	S	M	25	45.45	14.45	0.00	#Error	0.00
			Data Totals:		173	314.55		0.00		
			Number of Species:		11					
			Number of Hybrids:		0					

River Code:	**09-573-000**	Stream:	**TWOMILE RUN**			Sample Date:	**2016-06-21**
River Mile:	**0.2**	Location:	TWOMILE RUN 4.8 MI. N OF ZALESKI @ ROAD NEAR MOUTH				
Time Fished:	1800 sec	Drainage:	4.9 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	2	4.00	1.57	0.00	#Error	0.00
Redfin Pickerel		P	M	P	2	4.00	1.57	0.00	#Error	0.00
Creek Chub		G	N	T	111	222.00	87.40	0.00	#Error	0.00
Yellow Bullhead		I	C	T	1	2.00	0.79	0.00	#Error	0.00
Green Sunfish		I	C	T	1	2.00	0.79	0.00	#Error	0.00
Johnny Darter		I	C	N	3	6.00	2.36	0.00	#Error	0.00
Fantail Darter		I	C	N	7	14.00	5.51	0.00	#Error	0.00
			Data Totals:		127	254.00		0.00		
			Number of Species:		7					
			Number of Hybrids:		0					

River Code:	**09-574-000**	Stream:	**EAST BRANCH RACCOON CREEK**			Sample Date:	**2016-06-27**
River Mile:	**6.6**	Location:	E. BR. RACCOON CREEK NE OF COONVILLE @ SANNER RD.				
Time Fished:	1000 sec	Drainage:	3.2 sq mi	Depth:		Data Source:	
Dist Fished:	0.18 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Creek Chub		G	N	T	32	54.86	59.26	0.00	#Error	0.00
Green Sunfish		I	C	T	7	12.00	12.96	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	5.14	5.56	0.00	#Error	0.00
Hybrid x Sunfish				N	12	20.57	22.22	0.00	#Error	0.00
			Data Totals:		54	92.57		0.00		
			Number of Species:		4					
			Number of Hybrids:		1					

River Code:	**09-574-000**	Stream:	**EAST BRANCH RACCOON CREEK**			Sample Date:	**2016-06-28**
River Mile:	**2.1**	Location:	E. BR. RACCOON CREEK ADJ. ST. RT. 56/328				
Time Fished:	1800 sec	Drainage:	15.3 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	2	4.00	1.07	0.00	#Error	0.00
Redfin Pickerel		P	M	P	5	10.00	2.67	0.00	#Error	0.00
White Sucker		O	S	T	2	4.00	1.07	0.00	#Error	0.00
Creek Chub		G	N	T	99	198.00	52.94	0.00	#Error	0.00
Striped Shiner		I	S	N	29	58.00	15.51	0.00	#Error	0.00
Central Stoneroller		H	N	N	3	6.00	1.60	0.00	#Error	0.00
Spotted Bass		C	C	N	1	2.00	0.53	0.00	#Error	0.00
Green Sunfish		I	C	T	28	56.00	14.97	0.00	#Error	0.00
Longear Sunfish		I	C	M	5	10.00	2.67	0.00	#Error	0.00
Hybrid x Sunfish				N	6	12.00	3.21	0.00	#Error	0.00
Blackside Darter		I	S	N	1	2.00	0.53	0.00	#Error	0.00
Johnny Darter		I	C	N	2	4.00	1.07	0.00	#Error	0.00
Fantail Darter		I	C	N	4	8.00	2.14	0.00	#Error	0.00
			Data Totals:		187	374.00		0.00		
			Number of Species:		13					
			Number of Hybrids:		1					

River Code:	**09-575-000**	Stream:	**WEST BRANCH RACCOON CREEK**			Sample Date:	**2016-06-30**
River Mile:	**5.7**	Location:	W. BR. RACCOON CREEK @ ILESBORO-CEDAR FALLS RD				
Time Fished:	1500 sec	Drainage:	3.8 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
White Sucker		O	S	T	4	8.00	2.11	0.00	#Error	0.00
Creek Chub		G	N	T	152	304.00	80.00	0.00	#Error	0.00
South. Redbelly Dace		H	S	N	26	52.00	13.68	0.00	#Error	0.00
Green Sunfish		I	C	T	5	10.00	2.63	0.00	#Error	0.00
Bluegill Sunfish		I	C	P	3	6.00	1.58	0.00	#Error	0.00
			Data Totals:		190	380.00		0.00		
			Number of Species:		5					
			Number of Hybrids:		0					

River Code:	**09-575-000**	Stream:	**WEST BRANCH RACCOON CREEK**			Sample Date:	**2016-08-11**
River Mile:	**0.2**	Location:	W. BR. RACCOON CREEK NEAR MOUTH @ ST. RT. 328				
Time Fished:	1777 sec	Drainage:	22.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	3	6.00	1.41	0.04	0.41	6.67
Redfin Pickerel		P	M	P	14	28.00	6.57	0.45	4.66	16.14
Golden Redhorse		I	S	M	2	4.00	0.94	0.20	2.02	49.00
Northern Hog Sucker		I	S	M	12	24.00	5.63	1.22	12.62	51.00
White Sucker		O	S	T	17	34.00	7.98	3.01	31.06	88.59
Spotted Sucker		I	S	N	1	2.00	0.47	0.11	1.11	54.00
Creek Chub		G	N	T	32	64.00	15.02	1.47	15.18	23.00
Redfin Shiner		I	N	N	1	2.00	0.47	0.01	0.06	3.00
Striped Shiner		I	S	N	31	62.00	14.55	0.88	9.04	14.13
Bluntnose Minnow		O	C	T	50	100.00	23.47	0.34	3.51	3.40
Yellow Bullhead		I	C	T	2	4.00	0.94	0.32	3.30	80.00
Rock Bass		C	C	N	1	2.00	0.47	0.33	3.42	166.00
Spotted Bass		C	C	N	7	14.00	3.29	0.26	2.72	18.86
Green Sunfish		I	C	T	8	16.00	3.76	0.22	2.27	13.75
Bluegill Sunfish		I	C	P	5	10.00	2.35	0.22	2.27	22.00
Longear Sunfish		I	C	M	13	26.00	6.10	0.50	5.20	19.38
Hybrid x Sunfish				N	1	2.00	0.47	0.02	0.25	12.00
Blackside Darter		I	S	N	3	6.00	1.41	0.03	0.33	5.33
Logperch		I	S	M	2	4.00	0.94	0.04	0.41	10.00
Johnny Darter		I	C	N	4	8.00	1.88	0.01	0.08	1.00
Fantail Darter		I	C	N	4	8.00	1.88	0.01	0.08	1.00
			Data Totals:		213	426.00		9.70		
			Number of Species:		21					
			Number of Hybrids:		1					

River Code:	**09-575-000**	Stream:	**WEST BRANCH RACCOON CREEK**			Sample Date:	**2016-06-20**
River Mile:	**0.2**	Location:	W. BR. RACCOON CREEK NEAR MOUTH @ ST. RT. 328				
Time Fished:	1800 sec	Drainage:	22.7 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	6	12.00	7.59	0.05	1.64	4.00
Redfin Pickerel		P	M	P	7	14.00	8.86	0.34	11.70	24.43
Creek Chub		G	N	T	12	24.00	15.19	1.08	36.96	45.00
Redfin Shiner		I	N	N	24	48.00	30.38	0.05	1.64	1.00
Striped Shiner		I	S	N	5	10.00	6.33	0.02	0.68	2.00
Bluntnose Minnow		O	C	T	3	6.00	3.80	0.01	0.41	2.00
Yellow Bullhead		I	C	T	5	10.00	6.33	0.60	20.53	60.00
Rock Bass		C	C	N	1	2.00	1.27	0.04	1.37	20.00
Longear Sunfish		I	C	M	9	18.00	11.39	0.72	24.64	40.00
Johnny Darter		I	C	N	1	2.00	1.27	0.00	0.07	1.00
Fantail Darter		I	C	N	6	12.00	7.59	0.01	0.34	0.83
			Data Totals:		79	158.00		2.92		
			Number of Species:		11					
			Number of Hybrids:		0					

River Code:	**09-576-000**	Stream:	**HONEY FORK**			Sample Date:	**2016-06-20**
River Mile:	**0.0**	Location:	HONEY FORK 1 MI W OF NEW PLYMOUTH @ MOUTH				
Time Fished:	1800 sec	Drainage:	10.5 sq mi	Depth:		Data Source:	
Dist Fished:	0.15 km	Basin:	Southeast Ohio River Tribs	Flow:	N	Sampler Type:	E

Species Name	IBI GRP	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave Weight (gm)
Least Brook Lamprey		F	N	N	1	2.00	1.02	0.00	#Error	0.00
White Sucker		O	S	T	2	4.00	2.04	0.00	#Error	0.00
Creek Chub		G	N	T	37	74.00	37.76	0.00	#Error	0.00
Striped Shiner		I	S	N	22	44.00	22.45	0.00	#Error	0.00
Bluntnose Minnow		O	C	T	20	40.00	20.41	0.00	#Error	0.00
Central Stoneroller		H	N	N	1	2.00	1.02	0.00	#Error	0.00
Blackside Darter		I	S	N	1	2.00	1.02	0.00	#Error	0.00
Johnny Darter		I	C	N	1	2.00	1.02	0.00	#Error	0.00
Fantail Darter		I	C	N	13	26.00	13.27	0.00	#Error	0.00
			Data Totals:		98	196.00		0.00		
			Number of Species:		9					
			Number of Hybrids:		0					

Appendix F — Fish IBI Scores and Metrics: Headwater and Wadeable

Headwater Sites

				Number of						Percent of Individuals						
River Mile	Type	Date	DA (sq mi)	Total Species	Minnow Species	Headwater Species	Sensitive Species	Darter & Sculpin Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Pioneering	Insect-ivores	DELT Anomalies	Rel No. minus tolerants/ (0.3km)	**IBI**
TRIB. TO RACCOON CREEK (RM 98.96) (09-500-011)																
Year: 2016																
0.10	F	9/19/2016	2.0	10(5)	2(1)	0(1)	1(1)	0(1)	2(3)	52.0(3)	6.7(5)	6.7(5)	56.0(5)	0.00(5)	86(3)	38
BIG BEAVER CREEK (09-500-012)																
Year: 2016																
0.90	E	6/28/2016	7.0	20(5)	6(5)	2(3)	5(5)	4(5)	7(5)	71.8(1)	29.4(1)	48.7(3)	25.5(3)	0.00(5)	234(3)	44
BULLSKIN CREEK (09-502-000)																
Year: 2016																
0.37	E	9/14/2016	14.0	22(5)	7(5)	1(1)	8(5)	4(3)	6(3)	27.6(5)	17.1(5)	34.5(3)	52.1(5)	0.00(5)	668(3)	48
	E	6/28/2016	14.0	24(5)	7(5)	2(3)	8(5)	4(3)	6(3)	31.0(5)	18.4(3)	39.7(3)	71.0(5)	0.00(5)	428(3)	48
LITTLE BULLSKIN CREEK (09-503-000)																
Year: 2016																
0.01	E	8/1/2016	5.0	9(3)	4(3)	3(3)	1(1)	3(3)	4(3)	38.7(3)	3.7(5)	20.1(5)	12.5(1)	0.00(5)	718(5)	40
CLEAR FORK (09-506-000)																
Year: 2016																
0.02	E	9/13/2016	8.0	26(5)	8(5)	0(1)	8(5)	2(3)	8(5)	27.2(5)	25.4(3)	28.1(5)	65.0(5)	0.00(5)	438(3)	50
DEER CREEK (09-511-000)																
Year: 2016																
0.20	E	8/1/2016	6.0	10(3)	4(3)	1(1)	1(1)	2(3)	3(3)	74.7(1)	5.3(5)	81.1(1)	23.2(3)	0.00(5)	48(1)	30
DICKASON RUN (09-514-000)																
Year: 2016																
2.37	E	7/20/2016	18.0	9(3)	1(1)	0(1)	3(1)	1(1)	2(1)	30.4(5)	0.0(5)	12.5(5)	58.9(5)	0.00(5)	78(1)	34

Headwater Sites

				Number of						Percent of Individuals						
River Mile	Type	Date	DA (sq mi)	Total Species	Minnow Species	Headwater Species	Sensitive Species	Darter & Sculpin Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Pioneering	Insect-ivores	DELT Anomalies	Rel No. minus tolerants/ (0.3km)	**IBI**
MEADOW RUN (09-524-000)																
Year: 2016																
3.10	E	9/13/2016	5.0	14(5)	5(3)	0(1)	1(1)	1(1)	3(3)	80.4(1)	27.1(1)	58.5(1)	20.5(3)	0.00(5)	90(1)	26
	E	8/3/2016	5.0	15(5)	5(3)	0(1)	1(1)	2(3)	4(3)	75.0(1)	32.7(1)	50.4(3)	24.2(3)	0.77(3)	130(3)	30
2.16	E	9/13/2016	9.0	16(5)	5(3)	1(1)	2(1)	3(3)	4(3)	67.6(1)	50.7(1)	41.1(3)	32.4(3)	0.00(5)	129(1)	30
	E	8/3/2016	9.0	17(5)	6(3)	1(1)	2(1)	3(3)	4(3)	62.5(1)	28.4(3)	42.4(3)	48.9(5)	0.87(3)	156(1)	32
0.72	E	9/7/2016	10.0	13(3)	2(1)	0(1)	3(3)	1(1)	3(3)	42.9(3)	37.4(1)	7.7(5)	52.8(5)	0.00(5)	95(1)	32
MCCONNEL RUN (09-528-000)																
Year: 2016																
1.98	E	6/29/2016	1.0	10(5)	4(5)	2(3)	1(3)	1(3)	3(5)	46.2(3)	5.3(5)	40.4(3)	55.6(5)	0.00(5)	214(5)	50
ELK FORK (09-530-000)																
Year: 2016																
13.90	E	9/12/2016	14.0	21(5)	6(3)	2(3)	4(3)	3(3)	4(3)	33.5(3)	20.3(3)	38.5(3)	59.3(5)	0.00(5)	584(3)	42
TRIB. TO ELK FORK (RM 11.17) (09-530-004)																
Year: 2016																
0.43	E	8/3/2016	2.0	12(5)	4(3)	1(1)	0(1)	1(1)	2(3)	78.1(1)	16.4(3)	72.6(1)	26.0(3)	0.00(5)	38(1)	28
WOLF RUN (09-533-000)																
Year: 2016																
3.80	E	6/29/2016	5.0	10(3)	3(3)	0(1)	1(1)	0(1)	1(1)	47.4(3)	0.0(5)	38.5(3)	74.4(5)	0.00(5)	98(1)	32
PUNCHEON FORK (09-534-000)																
Year: 2016																
2.82	E	6/29/2016	5.0	8(3)	5(3)	2(3)	0(1)	1(1)	3(3)	71.8(1)	23.1(3)	66.7(1)	18.0(3)	0.00(5)	22(1)	28
1.51	E	6/28/2016	7.0	14(5)	5(3)	2(3)	1(1)	2(3)	3(3)	48.6(3)	13.6(5)	47.1(3)	55.0(5)	0.00(5)	144(1)	40
0.28	E	6/28/2016	10.0	13(3)	5(3)	1(1)	1(1)	3(3)	4(3)	41.6(3)	12.0(5)	40.7(3)	58.4(5)	0.00(5)	244(3)	38

Headwater Sites

				Number of						Percent of Individuals						
River Mile	Type	Date	DA (sq mi)	Total Species	Minnow Species	Headwater Species	Sensitive Species	Darter & Sculpin Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Pioneering	Insect-ivores	DELT Anomalies	Rel No. minus tolerants/ (0.3km)	**IBI**
INDIAN CREEK (09-539-000)																
Year: 2016																
1.58	E	8/30/2016	10.0	21(5)	5(3)	2(3)	4(3)	4(5)	6(3)	38.3(3)	24.5(3)	22.5(5)	42.7(3)	0.00(5)	428(3)	44
	E	8/2/2016	10.0	19(5)	5(3)	2(3)	3(3)	3(3)	5(3)	42.5(3)	32.6(1)	19.9(5)	40.2(3)	0.84(3)	500(3)	38
1.45	E	8/2/2016	10.0	15(5)	4(3)	1(1)	2(1)	3(3)	4(3)	26.9(5)	9.9(5)	28.7(5)	43.5(5)	0.45(5)	326(3)	44
	E	7/21/2016	10.0	21(5)	7(5)	3(3)	4(3)	4(5)	6(3)	37.5(3)	16.7(3)	35.7(3)	39.0(3)	0.00(5)	890(5)	46
LITTLE INDIAN CREEK (09-540-000)																
Year: 2016																
0.17	E	6/28/2016	10.0	18(5)	6(3)	3(3)	3(3)	3(3)	6(5)	43.4(3)	20.5(3)	38.9(3)	55.0(5)	0.00(5)	489(3)	44
ROBINSON RUN (09-544-000)																
Year: 2016																
0.18	E	8/2/2016	10.0	17(5)	5(3)	2(3)	2(1)	3(3)	5(3)	48.2(3)	12.1(5)	59.0(1)	43.4(5)	0.00(5)	156(1)	38
STRONGS RUN (09-546-000)																
Year: 2016																
5.90	E	7/21/2016	6.0	14(5)	6(5)	3(3)	1(1)	3(3)	5(3)	60.9(1)	15.4(3)	65.9(1)	37.6(3)	0.00(5)	406(3)	36
0.58	E	7/20/2016	16.0	16(3)	4(3)	2(3)	4(3)	4(3)	6(3)	56.1(1)	15.2(5)	54.9(3)	36.6(3)	0.61(5)	144(1)	36
WILLIAMS RUN (09-547-000)																
Year: 2016																
0.10	E	7/21/2016	4.0	15(5)	7(5)	1(1)	1(1)	2(3)	4(3)	48.9(3)	12.7(3)	53.3(3)	48.0(5)	0.00(5)	330(3)	40
FLATLICK RUN (09-549-000)																
Year: 2016																
0.60	E	7/21/2016	7.0	18(5)	5(3)	2(3)	3(3)	3(3)	5(3)	77.1(1)	31.4(1)	50.8(3)	31.0(3)	0.31(5)	146(1)	34

Headwater Sites

				Number of						Percent of Individuals						
River Mile	Type	Date	DA (sq mi)	Total Species	Minnow Species	Headwater Species	Sensitive Species	Darter & Sculpin Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Pioneering	Insect-ivores	DELT Anomalies	Rel No. minus tolerants/ (0.3km)	**IBI**
INDIANCAMP RUN (09-551-000)																
Year: 2016																
0.30	E	7/27/2016	2.0	9(5)	3(3)	2(3)	0(1)	2(3)	2(3)	83.6(1)	9.5(5)	73.3(1)	36.2(5)	0.00(5)	42(1)	36
ROCKCAMP RUN (09-552-000)																
Year: 2016																
0.11	E	8/2/2016	3.0	2(1)	0(1)	0(1)	0(1)	0(1)	1(1)	100.0(1)	25.0(1)	75.0(1)	75.0(1)	0.00(1)	0(1)	12
PIERCE RUN (09-553-000)																
Year: 2016																
5.47	E	6/29/2016	3.0	6(3)	3(3)	0(1)	1(1)	0(1)	1(1)	95.9(1)	4.1(5)	94.5(1)	24.7(3)	0.00(5)	6(1)	26
1.68	E	6/29/2016	10.0	14(3)	3(1)	0(1)	3(3)	1(1)	5(3)	52.6(3)	14.5(5)	38.2(3)	65.8(5)	0.00(5)	86(1)	34
LONG RUN (09-556-000)																
Year: 2016																
1.40	E	8/22/2016	2.0	11(5)	7(5)	3(3)	0(1)	2(3)	4(5)	80.8(1)	10.3(5)	65.8(1)	21.9(3)	0.00(5)	56(3)	40
FLAT RUN (09-557-000)																
Year: 2016																
1.60	E	7/27/2016	5.0	18(5)	6(5)	1(1)	2(3)	2(3)	3(3)	42.2(3)	30.3(1)	32.2(3)	52.1(5)	0.00(5)	244(3)	40
ONION CREEK (09-561-000)																
Year: 2016																
1.41	E	6/29/2016	8.0	17(5)	5(3)	2(3)	2(1)	2(3)	3(3)	40.5(3)	17.6(3)	36.6(3)	55.7(5)	0.00(5)	156(1)	38
LAUREL RUN (09-562-000)																
Year: 2016																
0.16	E	8/4/2016	3.0	18(5)	6(5)	2(3)	1(1)	3(5)	3(3)	78.4(1)	31.1(1)	71.0(1)	20.3(3)	0.00(5)	77(3)	36

Headwater Sites

				Number of						Percent of Individuals						
River Mile	Type	Date	DA (sq mi)	Total Species	Minnow Species	Headwater Species	Sensitive Species	Darter & Sculpin Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Pioneering	Insect-ivores	DELT Anomalies	Rel No. minus tolerants/ (0.3km)	**IBI**
HEWETT FORK (09-563-000)																
Year: 2017																
13.10	E	7/6/2017	8.0	10(3)	2(1)	0(1)	1(1)	1(1)	3(3)	38.1(3)	1.2(5)	27.4(5)	85.7(5)	0.00(5)	89(1)	34
Year: 2016																
13.10	E	6/27/2016	8.0	9(3)	2(1)	0(1)	1(1)	1(1)	2(1)	38.8(3)	2.4(5)	41.2(3)	67.1(5)	0.00(5)	104(1)	30
8.40	E	6/27/2016	16.0	10(3)	3(1)	2(3)	1(1)	3(3)	2(1)	57.5(1)	25.0(3)	57.5(1)	35.0(3)	0.00(5)	34(1)	26
ROCKCAMP CREEK (09-564-000)																
Year: 2016																
1.53	E	7/19/2016	6.0	10(3)	3(3)	2(3)	1(1)	2(3)	2(1)	58.7(1)	16.3(3)	60.9(1)	37.0(3)	0.00(5)	76(1)	28
COAL RUN (09-565-000)																
Year: 2016																
0.05	E	8/22/2016	1.0	4(3)	1(1)	0(1)	0(1)	1(3)	2(5)	96.4(1)	6.0(5)	90.5(1)	2.4(1)	0.00(5)	7(1)	28
PINE RUN (09-566-000)																
Year: 2016																
0.10	F	9/19/2016	2.0	6(3)	1(1)	0(1)	0(1)	0(1)	1(1)	42.9(3)	4.8(5)	28.6(5)	47.6(5)	0.00(5)	29(1)	32
GRASS RUN (09-567-000)																
Year: 2016																
0.04	E	6/27/2016	3.0	4(1)	1(1)	0(1)	0(1)	1(1)	1(1)	70.3(1)	5.4(5)	73.0(1)	8.1(1)	0.00(5)	26(1)	20
SANDY RUN (09-568-000)																
Year: 2016																
2.70	E	6/27/2016	5.0	9(3)	4(3)	3(3)	1(1)	1(1)	4(3)	82.0(1)	12.2(5)	73.8(1)	14.0(1)	0.00(5)	91(1)	28
LITTLE SANDY RUN (09-569-000)																
Year: 2016																
0.40	F	9/20/2016	2.0	9(5)	2(1)	0(1)	1(1)	0(1)	1(1)	58.1(1)	21.0(1)	4.8(5)	41.9(5)	0.00(5)	52(3)	30

Headwater Sites

				Number of						Percent of Individuals						
River Mile	Type	Date	DA (sq mi)	Total Species	Minnow Species	Headwater Species	Sensitive Species	Darter & Sculpin Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Pioneering	Insect-ivores	DELT Anomalies	Rel No. minus tolerants/ (0.3km)	**IBI**
BRUSHY FORK (09-571-000)																
Year: 2016																
6.87	E	8/25/2016	8.0	1(1)	1(1)	0(1)	0(1)	0(1)	0(1)	100.0(1)	0.0(1)	100.0(1)	0.0(1)	0.00(1)	0(1)	12
SIVERLY CREEK (09-571-002)																
Year: 2016																
0.30	E	7/27/2016	10.0	11(3)	6(3)	3(3)	3(3)	2(3)	7(5)	60.1(1)	17.3(3)	43.9(3)	28.9(3)	0.00(5)	125(1)	36
TWOMILE RUN (09-573-000)																
Year: 2016																
0.16	E	6/21/2016	5.0	7(3)	1(1)	2(3)	0(1)	2(3)	0(1)	89.0(1)	0.0(5)	90.6(1)	9.5(1)	0.00(5)	28(1)	26
EAST BRANCH RACCOON CREEK (09-574-000)																
Year: 2016																
6.64	E	6/27/2016	3.0	3(1)	1(1)	0(1)	0(1)	0(1)	0(1)	72.2(1)	0.0(5)	72.2(1)	18.5(3)	0.00(5)	26(1)	22
2.10	E	6/28/2016	15.0	12(3)	3(1)	2(3)	1(1)	3(3)	3(1)	69.0(1)	1.1(5)	69.0(1)	36.9(3)	0.00(5)	116(1)	28
WEST BRANCH RACCOON CREEK (09-575-000)																
Year: 2016																
5.68	E	6/30/2016	4.0	5(1)	2(1)	1(1)	0(1)	0(1)	2(1)	84.7(1)	2.1(5)	82.6(1)	4.2(1)	0.00(5)	58(1)	20
HONEY FORK (09-576-000)																
Year: 2016																
0.01	E	6/20/2016	11.0	9(3)	4(3)	2(3)	0(1)	3(3)	3(1)	60.2(1)	22.5(3)	59.2(1)	37.8(3)	0.00(5)	78(1)	28

Wading Sites				Number of					Percent of Individuals								
River Mile	Type	Date	DA (sq mi)	Total Species	Sunfish Species	Sucker Species	Intolerant Species	Darter Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Top Carni-vores	Insect-ivores	DELT Anomalies	Rel. No. minus tolerants/ (0.3km)	**IBI**	**MIwb**
RACCOON CREEK (09-500-000)																	
Year: 2016																	
111.38	E	9/1/2016	43.0	18(3)	4(5)	2(3)	0(1)	3(3)	25.5(3)	27.9(3)	14.2(5)	8.8(5)	65.2(5)	0.00(5)	220(3)	44	7.9
	E	8/11/2016	43.0	18(3)	4(5)	4(5)	0(1)	3(3)	20.0(3)	45.5(3)	37.7(1)	6.4(5)	46.4(3)	0.00(5)	180(1)	38	7.8
104.63	D	9/15/2016	56.0	19(3)	5(5)	3(3)	0(1)	2(1)	37.0(5)	39.6(3)	23.1(3)	4.0(3)	63.4(5)	0.00(5)	248(3)	40	7.9
	D	6/29/2016	56.0	15(3)	4(5)	2(3)	0(1)	3(3)	29.2(3)	48.5(1)	13.1(5)	8.5(5)	64.6(5)	0.00(5)	100(1)	40	6.8
98.34	E	8/15/2016	100.0	21(3)	4(5)	3(3)	1(1)	5(5)	47.4(5)	25.4(3)	11.2(5)	6.6(5)	66.2(5)	0.35(5)	321(3)	48	8.1
	E	7/14/2016	100.0	21(3)	5(5)	3(3)	0(1)	4(3)	49.8(5)	21.5(5)	10.1(5)	6.5(5)	72.5(5)	0.00(5)	291(3)	48	8.2
89.98	D	9/1/2016	136.0	24(5)	5(5)	2(1)	1(1)	6(5)	59.8(5)	19.8(5)	16.0(5)	7.9(5)	71.5(5)	0.42(3)	578(3)	48	8.5
	D	7/19/2016	136.0	19(3)	4(5)	2(1)	1(1)	6(5)	43.8(5)	9.9(5)	9.4(5)	14.8(5)	71.4(5)	0.00(5)	274(3)	48	8.6
72.22	C	7/26/2016	223.0	22(5)	3(3)	6(5)	1(1)	5()	66.8(5)	10.4(5)	10.0(5)	5.4(3)	77.6(5)	0.00(5)	773(5)	50	9.6
55.48	D	9/6/2016	322.0	24(5)	4(5)	5(5)	1(1)	6(5)	50.0(5)	15.6(5)	5.8(5)	6.5(5)	86.4(5)	0.65(5)	195(1)	52	8.6
LITTLE RACCOON CREEK (09-510-000)																	
Year: 2017																	
18.45	D	9/7/2017	87.0	11(1)	4(5)	0(1)	1(1)	3(3)	13.6(1)	27.3(1)	0.0(1)	22.7(1)	72.7(1)	0.00(1)	24(1)	18	5.5
Year: 2016																	
	D	9/7/2016	87.0	18(3)	5(5)	3(3)	1(1)	5(5)	47.9(5)	14.6(5)	4.2(5)	25.0(5)	70.8(5)	0.00(5)	49(1)	48	7.1
1.17	D	9/1/2016	154.0	26(5)	4(5)	3(3)	3(3)	7(5)	50.4(5)	22.1(3)	15.0(5)	8.9(5)	75.0(5)	0.00(5)	327(3)	52	9.1
DICKASON RUN (09-514-000)																	
Year: 2016																	
0.11	E	9/7/2016	27.0	14(3)	2(3)	1(1)	1(1)	3(3)	48.3(5)	25.3(5)	8.1(5)	4.6(3)	82.8(5)	0.00(5)	98(1)	40	6.4
	E	7/20/2016	27.0	15(3)	1(1)	1(1)	1(1)	4(5)	34.0(3)	34.0(3)	12.2(5)	2.7(3)	72.1(5)	0.00(5)	146(1)	36	6.8
ELK FORK (09-530-000)																	
Year: 2016																	
13.26	E	8/24/2016	25.0	22(5)	4(5)	4(5)	0(1)	4(5)	40.3(5)	22.7(5)	11.7(5)	2.2(3)	70.5(5)	0.00(5)	592(3)	52	9.0
	E	7/20/2016	25.0	22(5)	4(5)	4(5)	0(1)	4(5)	31.8(3)	26.7(5)	18.9(3)	4.2(3)	56.0(5)	0.00(5)	648(3)	48	9.4
8.55	E	8/24/2016	44.0	21(5)	4(5)	4(5)	0(1)	4(3)	57.0(5)	16.6(5)	10.6(5)	9.3(5)	78.8(5)	0.66(5)	189(1)	50	8.3
	E	7/8/2016	44.0	16(3)	3(3)	2(3)	0(1)	4(3)	31.9(3)	31.9(3)	23.3(3)	4.3(3)	64.7(5)	0.00(5)	118(1)	36	7.1

Wading Sites				Number of					Percent of Individuals								
River Mile	Type	Date	DA (sq mi)	Total Species	Sunfish Species	Sucker Species	Intolerant Species	Darter Species	Simple Lithophils	Tolerant Fishes	Omni-vores	Top Carni-vores	Insect-ivores	DELT Anomalies	Rel. No. minus tolerants/ (0.3km)	**IBI**	**MIwb**
0.01	E	8/24/2016	60.0	21(5)	3(3)	2(3)	1(1)	5(5)	45.7(5)	30.0(3)	6.3(5)	4.5(3)	66.8(5)	0.45(5)	234(3)	46	8.3
	D	7/20/2016	60.0	20(3)	5(5)	2(3)	1(1)	4(3)	51.5(5)	17.2(5)	4.0(5)	6.1(5)	74.8(5)	0.00(5)	123(1)	46	7.4
Year: 2017																	
8.55	E	9/6/2017	44.0	15(3)	4(5)	3(3)	0(1)	2(1)	28.1(3)	6.7(5)	1.2(5)	2.4(3)	95.1(5)	0.00(5)	230(3)	42	7.3
HEWETT FORK (09-563-000)																	
Year: 2017																	
4.31	E	9/6/2017	28.0	17(3)	4(5)	1(1)	1(1)	4(5)	30.1(3)	46.2(3)	37.6(1)	7.5(5)	44.5(3)	0.00(5)	140(1)	36	7.3
Year: 2016																	
	E	8/15/2016	28.0	16(3)	4(5)	1(1)	0(1)	3(3)	34.3(3)	40.3(3)	14.2(5)	6.7(5)	55.2(5)	0.75(5)	120(1)	40	7.0
0.01	D	9/12/2016	41.0	23(5)	4(5)	3(3)	1(1)	6(5)	40.0(5)	19.2(5)	13.3(5)	11.3(5)	66.3(5)	0.00(5)	291(3)	52	9.0
BRUSHY FORK (09-571-000)																	
Year: 2016																	
0.36	E	8/22/2016	33.0	15(3)	3(3)	3(3)	0(1)	3(3)	41.1(5)	37.1(3)	14.1(5)	3.2(3)	54.8(5)	0.00(5)	234(3)	42	7.0
	E	7/20/2016	33.0	13(3)	2(3)	0(1)	0(1)	2(1)	20.0(3)	42.0(3)	2.0(5)	10.0(5)	36.0(3)	0.00(5)	87(1)	34	5.9
WEST BRANCH RACCOON CREEK (09-575-000)																	
Year: 2016																	
0.15	E	8/11/2016	23.0	20(5)	4(5)	4(5)	0(1)	4(5)	31.9(3)	51.2(1)	31.5(3)	10.3(5)	41.3(3)	0.00(5)	208(3)	44	8.1
	E	6/20/2016	23.0	11(3)	2(3)	0(1)	0(1)	2(3)	6.3(1)	25.3(5)	3.8(5)	10.1(5)	63.3(5)	0.00(5)	118(1)	38	6.1

Boating Sites				Number of				Percent of Individuals									
River Mile	Type	Date	DA (sq mi)	Total Species	Sunfish Species	Sucker Species	Intolerant Species	Rnd Body Sucker	Simple Lithophils	Tolerant Fishes	Omni-vores	Top Carni-vores	Insect-ivores	DELT Anomalies	Rel. No. minus tolerants/ (0.3km)	**IBI**	**MIwb**
RACCOON CREEK (09-500-000)																	
Year: 2016																	
99.60	A	8/23/2016	98.0	21(5)	5(5)	5(3)	0(1)	23.2(3)	31.9(3)	7.3(5)	3.6(5)	16.7(5)	74.6(5)	0.00(5)	366(3)	48	9.4
89.36	A	8/23/2016	176.0	25(5)	4(5)	4(3)	1(1)	11.3(1)	46.4(3)	16.7(3)	13.3(5)	10.9(5)	66.6(5)	0.00(5)	610(5)	46	9.8
84.08	A	9/6/2016	183.0	20(3)	6(5)	5(3)	0(1)	51.3(5)	55.0(5)	6.3(5)	5.8(5)	17.3(5)	74.4(5)	0.00(5)	377(3)	50	9.3
	A	8/8/2016	183.0	27(5)	6(5)	6(5)	2(3)	33.3(3)	47.0(3)	8.1(5)	5.1(5)	14.1(5)	79.8(5)	1.01(3)	364(3)	50	9.5
80.62	A	9/12/2016	200.0	19(3)	5(5)	5(3)	1(1)	49.8(5)	53.1(5)	2.9(5)	1.2(5)	9.8(3)	88.2(5)	0.41(5)	476(5)	50	8.6
	A	8/24/2016	200.0	21(5)	5(5)	5(3)	0(1)	40.7(5)	51.0(5)	1.9(5)	1.9(5)	18.7(5)	78.7(5)	0.00(5)	304(3)	52	9.0
63.80	A	8/10/2016	296.0	27(5)	4(5)	5(3)	2(3)	32.1(3)	64.7(5)	16.9(3)	12.5(5)	6.2(3)	78.6(5)	0.00(5)	560(5)	50	9.5
55.48	A	8/10/2016	322.0	20(3)	4(5)	6(5)	1(1)	37.3(3)	58.0(5)	17.3(3)	6.7(5)	6.7(3)	85.3(5)	0.00(5)	248(3)	46	8.5
40.01	A	7/25/2016	381.0	33(5)	5(5)	9(5)	4(5)	53.1(5)	63.3(5)	6.8(5)	6.8(5)	9.0(3)	81.0(5)	0.00(5)	527(5)	58	10.4
35.61	A	9/8/2016	542.0	31(5)	4(5)	7(5)	3(3)	42.7(5)	60.5(5)	16.4(3)	17.1(3)	4.8(1)	74.2(5)	0.00(5)	610(5)	50	10.2
	A	8/17/2016	542.0	25(5)	4(5)	6(5)	1(1)	55.5(5)	65.8(5)	2.5(5)	2.5(5)	7.9(3)	84.7(5)	0.00(5)	394(3)	52	9.6
29.20	A	8/17/2016	586.0	26(5)	6(5)	8(5)	1(1)	40.2(5)	57.5(5)	7.1(5)	7.9(5)	12.6(5)	74.0(5)	0.00(5)	236(3)	54	10.1
	A	7/13/2016	586.0	28(5)	5(5)	8(5)	2(3)	30.9(3)	46.7(3)	24.9(3)	24.9(3)	4.8(1)	68.8(5)	0.57(3)	530(5)	44	10.2
22.00	A	8/31/2016	615.0	31(5)	4(5)	8(5)	2(3)	35.9(3)	51.6(5)	19.1(3)	19.9(3)	10.9(5)	63.3(5)	0.00(5)	414(3)	50	10.2
	A	7/13/2016	615.0	27(5)	3(3)	8(5)	2(3)	31.5(3)	41.9(3)	1.8(5)	1.8(5)	5.0(3)	85.3(5)	0.00(5)	548(5)	50	10.3
10.20	A	8/29/2016	648.0	24(5)	3(3)	5(3)	2(3)	12.8(1)	15.4(1)	11.4(5)	18.0(3)	5.1(3)	69.2(5)	0.00(5)	484(5)	42	9.9
	A	7/25/2016	648.0	29(5)	3(3)	6(5)	4(5)	8.4(1)	13.4(1)	0.6(5)	7.2(5)	5.6(3)	77.9(5)	0.62(3)	638(5)	46	10.0
LITTLE RACCOON CREEK (09-510-000)																	
Year: 2016																	
27.90	A	8/16/2016	48.0	16(3)	4(5)	2(1)	0(1)	13.8(1)	14.3(1)	5.3(5)	8.5(5)	13.2(5)	77.8(5)	0.53(5)	597(5)	42	8.8
24.55	A	8/16/2016	63.0	19(3)	4(5)	3(3)	0(1)	7.3(1)	9.3(1)	8.0(5)	4.7(5)	9.3(3)	83.3(5)	0.00(5)	460(5)	42	9.0
12.71	A	6/23/2016	99.0	23(5)	4(5)	5(3)	0(1)	28.7(3)	51.5(5)	24.6(3)	21.0(3)	12.0(5)	65.9(5)	0.00(5)	315(3)	46	9.1
11.00	A	9/7/2016	129.0	21(5)	5(5)	5(3)	0(1)	17.9(1)	23.2(1)	49.1(1)	45.5(1)	15.2(5)	34.8(3)	0.00(5)	228(3)	34	9.0
	A	8/9/2016	129.0	19(3)	3(3)	7(5)	1(1)	24.5(3)	33.0(3)	42.6(1)	39.4(1)	11.7(5)	44.7(3)	0.00(5)	180(1)	34	8.9

Appendix G — QHEI Index Scores and Metrics

Station	Station Name	HUC12	River Code	RM	DA	EcoRegion	Lat	Long	SampleDt	Substrate	Cover	Channel	Bank	Pool	Riffle	Gradient	QHEI
W03W43	W. BR. RACCOON CREEK NEAR MOUTH @ ST. RT. 328	05090101 02 02	09-575-000	0.15	22.7	Western Allegheny Plateau	39.380300	-82.397800	06/20/2016	10.5	16	13	3	9	1.5	10	63
W03P35	HONEY FORK 1 MI W OF NEW PLYMOUTH @ MOUTH	05090101 02 02	09-576-000	0.01	10.5	Western Allegheny Plateau	39.383012	-82.418753	06/20/2016	10.5	13	15	6.25	5	1.5	10	61.25
W03W58	TWOMILE RUN 4.8 MI. N OF ZALESKI @ ROAD NEAR MOUTH	05090101 02 04	09-573-000	0.16	4.9	Western Allegheny Plateau	39.357200	-82.382500	06/21/2016	10	14	12.5	9.5	4.5	0	8	58.5
W03S06	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.	05090101 04 03	09-510-000	12.71	99	Western Allegheny Plateau	39.010600	-82.452200	06/23/2016	10	12	14	7.25	10	0	4	57.25
303739	Hewett Fork Adj. Waterloo Aquatic Center	05090101 03 01	09-563-000	8.4	16.4	Western Allegheny Plateau	39.347464	-82.253128	06/27/2016	11	16	11.5	7	10	3	10	68.5
W03K37	HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD.	05090101 03 01	09-563-000	13.1	8.3	Western Allegheny Plateau	39.391900	-82.249700	06/27/2016	7	13	13	9	10	2	6	60
W03P08	HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20	05090101 03 01	09-563-000	4.31	28.1	Western Allegheny Plateau	39.317500	-82.278100	06/27/2016	13	15	17	5.25	10	4	6	70.25
W03P41	GRASS RUN N OF MINERAL @ ST. RT. 356	05090101 03 01	09-567-000	0.04	2.7	Western Allegheny Plateau	39.346065	-82.254746	06/27/2016	12.5	16	16.5	7	9	2	10	73
W03W37	E. BR. RACCOON CREEK NE OF COONVILLE @ SANNER RD.	05090101 02 01	09-574-000	6.64	3.2	Western Allegheny Plateau	39.416780	-82.325388	06/27/2016	13.5	14	17	7.5	10	3.5	10	75.5
203966	SANDY RUN UPST. LAKE HOPE @ KING HOLLOW TRAIL	05090101 02 05	09-568-000	2.7	5	Western Allegheny Plateau	39.333708	-82.331951	06/27/2016	11	12	14	10	10	2	6	65
W03W07	PUNCHEON FORK E OF MCARTHUR @ TWP. RD. 11	05090101 03 02	09-534-000	0.28	9.8	Western Allegheny Plateau	39.245600	-82.465400	06/28/2016	12.5	16	14	6.75	10	3.5	10	72.75
303508	BIG BEAVER CREEK AT GUTHRE RD. S. OF RIO GRANDE	05090101 06 03	09-500-012	0.9	7.3	Western Allegheny Plateau	38.841216	-82.379927	06/28/2016	10.5	15	14	7.25	10	3	4	63.75
W03K21	BULLSKIN CREEK AT THIVENOR @ ST. RT. 218	05090101 06 04	09-502-000	0.37	14.4	Western Allegheny Plateau	38.735000	-82.248300	06/28/2016	15	16	16	5.25	11	5	10	78.25
W03P14	L. INDIAN CREEK N OF RIO GRANDE @ ST. RT. 325	05090101 06 01	09-540-000	0.17	10.2	Western Allegheny Plateau	38.892800	-82.382500	06/28/2016	12.5	13	17	4.75	8	3	10	68.25
W03K17	E. BR. RACCOON CREEK ADJ. ST. RT. 56/328	05090101 02 01	09-574-000	2.1	15.3	Western Allegheny Plateau	39.396900	-82.375000	06/28/2016	12.5	16	13.5	6.25	9.5	4	10	71.75
W03W30	PUNCHEON FORK UPST. MCARTHUR WWTP @ CO. RD. 25	05090101 03 02	09-534-000	1.51	7.2	Western Allegheny Plateau	39.243300	-82.484400	06/28/2016	11	15	15.5	7	10	2.5	10	71
301746	RACCOON CREEK DST. MITCHELL HOLLOW @ ST. RT. 328	05090101 02 04	09-500-000	104.63	56.4	Western Allegheny Plateau	39.320320	-82.417980	06/29/2016	10	19	12.5	6.5	10	3	4	65
W03W47	PIERCE RUN AT RADCLIFF @ TWP. RD. 2	05090101 05 01	09-553-000	1.68	9.5	Western Allegheny Plateau	39.141100	-82.380300	06/29/2016	4	13	12	6	7	1	10	53
203947	WOLF RUN SE OF MCARTHUR @ CO. RD. 24	05090101 03 02	09-533-000	3.8	4.7	Western Allegheny Plateau	39.215600	-82.461100	06/29/2016	5.5	18	15	6	10	2	8	64.5
303688	MCCONNEL RUN AT LAKE RD (CR 15) N OF LAKE RUPERT	05090101 04 01	09-528-000	1.98	0.9	Western Allegheny Plateau	39.221375	-82.516245	06/29/2016	10	6	8	6	3	1	2	36
W03K30	PUNCHEON FORK UPST. MCARTHUR @ TWP. RD. 20	05090101 03 02	09-534-000	2.82	4.7	Western Allegheny Plateau	39.251100	-82.503600	06/29/2016	13.5	11	15	7	5	3.5	4	59
W03L08	PIERCE RUN W OF ORETON, DST. GOB PILE 82001305	05090101 05 01	09-553-000	5.47	3.4	Western Allegheny Plateau	39.165600	-82.421700	06/29/2016	14	11	13.5	9	6	4	10	67.5
W03W45	ONION CREEK SE OF KNOX @ CO. RD. 4	05090101 03 04	09-561-000	1.41	8.3	Western Allegheny Plateau	39.259700	-82.268100	06/29/2016	8	16	9.5	6	9	1.5	8	58
W03W36	W. BR. RACCOON CREEK @ ILESBORO-CEDAR FALLS RD	05090101 02 02	09-575-000	5.68	3.8	Western Allegheny Plateau	39.419700	-82.469200	06/30/2016	11.5	15	17	6.5	8	2.5	10	70.5
W03W14	ELK FORK SW OF PRATTSVILLE @ GRAVEL ROAD DST. WOLF RUN	05090101 03 03	09-530-000	8.55	44.4	Western Allegheny Plateau	39.216700	-82.404900	07/08/2016	10	17	13	8.5	10	2	6	66.5
W03W44	RACCOON CREEKSW OF ZALESKI @ FOREST ROAD #3	05090101 02 05	09-500-000	98.34	100	Western Allegheny Plateau	39.267200	-82.402500	07/14/2016	7.5	18	16	10	10	3	4	68.5
W03P33	ROCKCAMP CREEK S OF MINERAL @ ST. RT. 356	05090101 03 01	09-564-000	1.53	5.8	Western Allegheny Plateau	39.309068	-82.264054	07/19/2016	7.5	12	14	5.75	5	1	8	53.25
302520	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.	05090101 02 05	09-500-000	89.98	136	Western Allegheny Plateau	39.310488	-82.324740	07/19/2016	15.5	17	17	10	12	8	8	87.5
W03P31	ELK FORK NE OF RADCLIFF @ CO. RD. 43B	05090101 03 03	09-530-000	0.01	59.8	Western Allegheny Plateau	39.161470	-82.352330	07/20/2016	12.5	15	17	5.25	12	3	6	70.75
W03S48	DICKASON RUN @ KEYSTONE FURNACE RD.	05090101 04 02	09-514-000	2.37	17.7	Western Allegheny Plateau	39.010800	-82.488900	07/20/2016	5.5	15	13	4	10	2	6	55.5
W03P43	DICKASON RUN NEAR KEYSTONE @ ORPHEUS-KEYSTONE RD.	05090101 04 02	09-514-000	0.11	26.9	Western Allegheny Plateau	39.008600	-82.455300	07/20/2016	10	15	15	9.5	7	1.5	6	64
W03S47	STRONGS RUN NE OF EWINGTON @ ADNEY RD.	05090101 05 02	09-546-000	0.58	16.4	Western Allegheny Plateau	39.014700	-82.336100	07/20/2016	10	10	13	8.75	8	0	10	59.75
W03K39	BRUSHY CREEK @ SR 328 NEAR MOUTH	05090101 02 03	09-571-000	0.36	33.4	Western Allegheny Plateau	39.308600	-82.440000	07/20/2016	11.5	12	11	4.5	8	2	6	55
W03P30	ELK FORK 1 MI. E OF MCARTHUR @ ST. RT. 50	05090101 03 02	09-530-000	13.26	24.5	Western Allegheny Plateau	39.241400	-82.453600	07/20/2016	15	18	17	9.25	12	5	10	86.25
203956	WILLIAMS RUN SE OF WILKESVILLE @ MOUTH	05090101 05 02	09-547-000	0.1	3.8	Western Allegheny Plateau	39.058196	-82.306958	07/21/2016	11	15	17	6.5	8	2	6	65.5
W03S39	FLATLICK RUN S OF WILKESVILLE @ NEWSOME RD. (CO. RD. 8)	05090101 05 03	09-549-000	0.6	7.2	Western Allegheny Plateau	39.046700	-82.345300	07/21/2016	9.5	15	15	7.25	9	0	8	63.75
W03W55	INDIAN CREEK DST. RIO GRANDE WWTP, UPST. L. INDIAN CREEK	05090101 06 01	09-539-000	1.45	10.4	Western Allegheny Plateau	38.890946	-82.380480	07/21/2016	14	17	16	9.5	9	4	10	79.5
W03S36	STRONGS RUN E OF WILKESVILLE @ TWP. RD. 24	05090101 05 02	09-546-000	5.9	5.9	Western Allegheny Plateau	39.070300	-82.302800	07/21/2016	9.5	12	14	7.75	7	0.5	8	58.75
W03S24	RACCOON CREEK AT NORTHUP, DST. DAM	05090101 06 05	09-500-000	10.2	648	Western Allegheny Plateau	38.783900	-82.281900	07/25/2016	13.5	17	14	6.75	12	5	10	78.25
W03P05	RACCOON CREEK AT VINTON @ ST. RT. 160	05090101 05 04	09-500-000	40.01	381	Western Allegheny Plateau	38.976100	-82.338300	07/25/2016	14.5	18	16	6.75	12	6.5	8	81.75
W03P07	RACCOON CREEK AT VALES MILLS @ ST. RT. 346	05090101 03 04	09-500-000	72.22	223	Western Allegheny Plateau	39.178300	-82.315000	07/26/2016	14.5	14	17	9.5	12	6.5	6	79.5
W03W51	FLAT RUN SE OF BOLINS MILLS @ U.S. RT. 50	05090101 03 04	09-557-000	1.6	4.8	Western Allegheny Plateau	39.220300	-82.270800	07/27/2016	9.5	16	12	5.25	8	2	8	60.75
W03K42	SIVERLY CREEK N OF CREOLA @ LANE NEAR MOUTH	05090101 02 03	09-571-002	0.3	10.1	Western Allegheny Plateau	39.329400	-82.465600	07/27/2016	8	15	16	6.75	9	3	10	67.75
W03W56	INDIANCAMP RUN SW OF CLARION, ADJ. CO. RD. 26	05090101 05 03	09-551-000	0.3	2.1	Western Allegheny Plateau	39.084200	-82.397200	07/27/2016	13.5	16	18	6.75	10	3.5	10	77.75
W03K22	L. BULLSKIN CREEK SW OF THIVENOR @ MOUTH	05090101 06 04	09-503-000	0.01	4.9	Western Allegheny Plateau	38.728300	-82.261100	08/01/2016	16.5	16	16	6	8	3.5	4	70
W03P15	DEER CREEK NEAR VINTON, NEAR MOUTH ADJ. ST. RT. 325	05090101 04 04	09-511-000	0.2	5.9	Western Allegheny Plateau	38.951900	-82.368900	08/01/2016	10	8	13.5	8	4	0	8	51.5
W03P36	INDIAN CREEK UPST. RIO GRANDE WWTP @ ST. RT. 325	05090101 06 01	09-539-000	1.58	10.4	Western Allegheny Plateau	38.889200	-82.382500	08/02/2016	11	16	13	5.5	10	2.5	10	68
W03W55	INDIAN CREEK DST. RIO GRANDE WWTP, UPST. L. INDIAN CREEK	05090101 06 01	09-539-000	1.45	10.4	Western Allegheny Plateau	38.890946	-82.380480	08/02/2016	11	14	15	9.25	8	3	10	70.25
W03S40	ROBINSON RUN N OF VINTON @ ST. RT. 325	05090101 05 04	09-544-000	0.18	9.7	Western Allegheny Plateau	38.995800	-82.335600	08/02/2016	10.5	16	14.5	8.5	8	1.5	10	69
W03W52	ROCKCAMP RUN NEAR HAWKS @ OLD RR NEAR MOUTH	05090101 05 03	09-552-000	0.11	2.8	Western Allegheny Plateau	39.109482	-82.388644	08/02/2016	11	13	12	10	10	3.5	6	65.5
W03W27	MEADOW RUN @ OLD/NEW ST. RT. 327, DST.TRIBS (RM 2.18)	05090101 04 01	09-524-000	2.16	8.7	Western Allegheny Plateau	39.105000	-82.537200	08/03/2016	5.5	15	9.5	9.25	8	4	10	61.25
W03S10	MEADOW RUN UPST. JENO'S	05090101 04 01	09-524-000	3.1	5.1	Western Allegheny Plateau	39.095800	-82.546700	08/03/2016	11	15	9.5	10	7	1	8	61.5
W03W09	TRIB. TO ELK FORK (11.17) E OF MCARTHUR @ CO. RD. 7	05090101 03 02	09-530-004	0.43	2.4	Western Allegheny Plateau	39.237900	-82.432100	08/03/2016	10.5	7	8	5	6	0.5	8	45
W03W59	LAUREL RUN NEAR KNOX @ TWP. RD. 18	05090101 03 04	09-562-000	0.16	2.6	Western Allegheny Plateau	39.267800	-82.290300	08/04/2016	8	16	16	9.5	8	2.5	4	64
W03W34	RACCOON CREEK NEAR KNOX, UPST ONION CREEK @ ST. RT. 356	05090101 03 04	09-500-000	84.08	183	Western Allegheny Plateau	39.264400	-82.288300	08/08/2016	9.5	16	13	10	8	0	6	62.5
W03K09	L. RACCOON CREEK @ JACKSON/GALLIA COUNTY LINE	05090101 04 04	09-510-000	11	129	Western Allegheny Plateau	39.009400	-82.445000	08/09/2016	12	13	12.5	9	10	3	6	65.5
W03W35	RACCOON CREEK 0.3 MI. UPST. ZINNS RUN @ CO. RD. 28	05090101 05 03	09-500-000	63.8	296	Western Allegheny Plateau	39.130300	-82.358600	08/10/2016	14.5	18	14	9.75	12	6	6	80.25
W03P18	RACCOON CREEK S OF CLARION @ ST. RT. 124	05090101 05 03	09-500-000	55.48	322	Western Allegheny Plateau	39.084200	-82.391100	08/10/2016	11	14	13	9.75	10	3.5	6	67.25

301747	RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328	05090101 02 04	09-500-000	111.38	42.8	Western Allegheny Plateau	39.372890	-82.395310	08/11/2016	9.5	14	13.5	8.25	9	1.5	6	61.75
W03W43	W. BR. RACCOON CREEK NEAR MOUTH @ ST. RT. 328	05090101 02 02	09-575-000	0.15	22.7	Western Allegheny Plateau	39.380300	-82.397800	08/11/2016	10.5	16	12.5	5.25	8	1	10	63.25
W03P08	HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20	05090101 03 01	09-563-000	4.31	28.1	Western Allegheny Plateau	39.317500	-82.278100	08/15/2016	11.5	16	12	6	11	3.5	6	66
W03S07	L. RACCOON CREEK UPST. MEADOW RUN @ CO. RD. 39	05090101 04 01	09-510-000	27.9	48	Western Allegheny Plateau	39.122500	-82.499400	08/16/2016	5.5	17	12.5	7	8	0	4	54
W03W25	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32	05090101 04 03	09-510-000	24.55	62.5	Western Allegheny Plateau	39.100300	-82.484900	08/16/2016	1	16	11	10	8	0	6	52
W03S44	RACCOON CREEK AT WOODS MILL @ EAGLE RD.	05090101 06 02	09-500-000	35.61	542	Western Allegheny Plateau	38.937800	-82.339200	08/17/2016	14	15	15	7.75	11	6	8	76.75
601400	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	05090101 06 03	09-500-000	29.2	586	Western Allegheny Plateau	38.873600	-82.356100	08/17/2016	14	14	14	9	10	5.5	6	72.5
203960	LONG RUN N OF VALES MILLS, ADJ CO. RD. 11K	05090101 03 04	09-556-000	1.4	2.2	Western Allegheny Plateau	39.205600	-82.310000	08/22/2016	13	12	15	7.5	4	3.5	10	65
W03W50	COAL RUN SE OF MINERAL @ ST. RT. 681	05090101 03 01	09-565-000	0.05	0.8	Western Allegheny Plateau	39.296913	-82.249371	08/22/2016	13	6	13	5.5	0	0	4	41.5
302519	RACCOON CREEK DST. HEWETT FORK @ CO. RD. 18 B	05090101 03 04	09-500-000	89.36	176	Western Allegheny Plateau	39.302602	-82.325880	08/23/2016	15	20	17	10	11	7	6	86
W03W32	RACCOON CREEK W OF ZALESKI @ ST. RT. 677	05090101 02 05	09-500-000	99.6	98	Western Allegheny Plateau	39.275600	-82.414400	08/23/2016	11	15	13	7.75	8	0	4	58.75
W03G50	RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50	05090101 03 04	09-500-000	80.62	200	Western Allegheny Plateau	39.230800	-82.286000	08/24/2016	10.5	15	14	7.25	9	0	6	61.75
W03K40	BRUSHY CREEK 2.7 MI. N OF CREOLA @ GRAVEL LANE OFF S.R. 93	05090101 02 03	09-571-000	6.87	8.4	Western Allegheny Plateau	39.355600	-82.458900	08/25/2016	4.5	12	14	8	7	0.5	8	54
303503	RACCOON CREEK ADJ. DAN JONES RD	05090101 06 03	09-500-000	22	615	Western Allegheny Plateau	38.803802	-82.370800	08/31/2016	12	16	17	10	12	5.5	8	80.5
W03P04	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	05090101 04 04	09-510-000	1.17	154	Western Allegheny Plateau	38.953100	-82.365600	09/01/2016	11	16	13	6.25	10	2.5	8	66.75
W03P18	RACCOON CREEK S OF CLARION @ ST. RT. 124	05090101 05 03	09-500-000	55.48	322	Western Allegheny Plateau	39.084200	-82.391100	09/06/2016	11	16	16	8.5	11	5	6	73.5
W03K10	L. RACCOON CREEK @ BUCKEYE FURNACE RD.	05090101 04 03	09-510-000	18.45	87	Western Allegheny Plateau	39.054400	-82.459700	09/07/2016	7	17	15	10	10	3	6	68
W03W18	MEADOW RUN E OF WELLSTON @ CHEATWOOD RD/T-383	05090101 04 01	09-524-000	0.72	9.9	Western Allegheny Plateau	39.115600	-82.515600	09/07/2016	7	14	11	6.25	8	0	4	50.25
W03W06	ELK FORK NEAR MCARTHUR, UPST. PUNCHEON FORK @ GRAVEL ROAD	05090101 03 02	09-530-000	13.9	14.4	Western Allegheny Plateau	39.246700	-82.460200	09/12/2016	13	19	14	7.75	9	3.5	10	76.25
W03P32	HEWETT FORK SE OF LAKE HOPE @ MOUTH	05090101 03 01	09-563-000	0.01	40.5	Western Allegheny Plateau	39.304465	-82.322649	09/12/2016	12	16	17	10	10	3.5	6	74.5
W03K23	CLEAR FORK NEAR NORTHUP @ INGALLS RD.	05090101 06 05	09-506-000	0.02	7.7	Western Allegheny Plateau	38.781400	-82.273600	09/13/2016	13	16	16.5	5.5	10	2	8	71
301746	RACCOON CREEK DST. MITCHELL HOLLOW @ ST. RT. 328	05090101 02 04	09-500-000	104.63	56.4	Western Allegheny Plateau	39.320320	-82.417980	09/15/2016	12	16	15	5.75	10	2.5	4	65.25
203928	TRIB. TO RACCOON CREEK (98.96) SW OF ZALESKI @ MOUTH	05090101 02 05	09-500-011	0.1	1.9	Western Allegheny Plateau	39.269303	-82.409882	09/19/2016	0	7	11	8.5	2	0	8	36.5
301579	PINE RUN NW OF MINERAL @ MOUTH	05090101 03 01	09-566-000	0.1	2	Western Allegheny Plateau	39.336367	-82.273519	09/19/2016	5	7	11	8	4	0.5	4	39.5
303689	LITTLE SANDY RUN AT ST. RT. 278 SOUTH OF LAKE HOPE	05090101 02 05	09-569-000	0.4	1.5	Western Allegheny Plateau	39.312566	-82.360799	09/20/2016	4.5	7	11	8.5	4	0	4	39
W03P32	HEWETT FORK SE OF LAKE HOPE @ MOUTH	05090101 03 01	09-563-000	0.01	40.5	Western Allegheny Plateau	39.304465	-82.322649	07/05/2017	12.5	18	17	10	10	6	2	75.5
W03K37	HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD.	05090101 03 01	09-563-000	13.1	8.3	Western Allegheny Plateau	39.391900	-82.249700	07/06/2017	10	17	13	9.25	7	3	6	65.25
303739	Hewett Fork Adj. Waterloo Aquatic Center	05090101 03 01	09-563-000	8.4	16.4	Western Allegheny Plateau	39.347464	-82.253128	07/06/2017	9	16	13	8.5	10	2	2	60.5
W03P08	HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20	05090101 03 01	09-563-000	4.31	28.1	Western Allegheny Plateau	39.317500	-82.278100	09/06/2017	13.5	17	14	6	10	3.5	6	70
W03W14	ELK FORK SW OF PRATTSVILLE @ GRAVEL ROAD DST. WOLF RUN	05090101 03 03	09-530-000	8.55	44.4	Western Allegheny Plateau	39.216700	-82.404900	09/06/2017	12	17	15.5	10	10	4	6	74.5
W03K10	L. RACCOON CREEK @ BUCKEYE FURNACE RD.	05090101 04 03	09-510-000	18.45	87	Western Allegheny Plateau	39.054400	-82.459700	09/07/2017	9	18	12	10	9	0	6	64

Appendix H — Surface Water Inorganic Chemistry Results

River Code:	**09-500-002**	Stream:	**TRIB. TO RACCOON CREEK (RM 34.64)**
River Mile:	**0.6**	Location:	TYCOON LAKE, L-1
Basin:	Southeast Ohio River Tribs	Drainage:	1.7 sq mi

Sample Type: Inorganic	**09-06-2016**	**09-29-2016**
Alkalinity (mg/L)	32.6	34.7
Aluminum (ug/L)	< 200	< 200
Ammonia (mg/L)	1.89	.168
Arsenic (ug/L)	8.7	< 2
Barium (ug/L)	< 15	31
Bicarbonate (mg/L)	83.6	34.2
Cadmium (ug/L)	< .2	< .2
Calcium (mg/L)	16.9	9.8
Carbonate (mg/L)	< 5	< 5
Chloride (mg/L)	< 5	< 5
Chlorophyll_a (ug/L)	89.2	24.8
Chromium (ug/L)	< 2	< 2
Copper, Low Level (ug/L)	< 2	< 2
Hardness, Total (mg/L)	57	40
Iron (ug/L)	10300	414
Lead (ug/L)	< 2	< 2
Magnesium (mg/L)	2.9	3.1
Manganese (ug/L)	108	330
Nickel (ug/L)	< 2	< 2
Nitrate, nitrite (mg/L)	< .1	< .1
Nitrite (mg/L)	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01
Pheophytin_a (ug/L)	6.1	5.5
Potassium (mg/L)	2.6	2.2
Selenium (ug/L)	< 2	< 2
Sodium (mg/L)	< 5	< 5
Solids, Total Dissolved (mg/L)	94	86
Strontium (ug/L)	39	46
Sulfate (mg/L)	10.3	10.8
TKN (mg/L)	3.73	.98
TOC (mg/L)	6.11	5.5
Total Phosphorus (mg/L)	.067	.024
Total Suspended Solids (mg/L)	< 5	5
Turbidity (NTU)	22.8	5.92
Zinc (ug/L)	< 10	< 10
CorrectedConductance(umhos/cm)	99	102
DissolvedOxygen(mg/L)	.74	5.46
pH(su)	8.48	6.46
SampleDepth(m)	.5	.5
Saturation(percent)	8.2	68.1
SecchiDiskDepth(m)	.73	.85
Temperature(deg C)	20.02	22.81
UncorrectedConductance(umhos/cm)	103	98

River Code:	**09-500-011**	Stream:	**TRIB. TO RACCOON CREEK (RM 98.96)**
River Mile:	**0.1**	Location:	TRIB. TO RACCOON CREEK (98.96) SW OF ZALESKI @ MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	1.9 sq mi

Sample Type: Inorganic	**07-27-2016**	**08-24-2016**	**09-15-2016**
Acidity (mg/L)	< 5	< 5	< 5
Alkalinity (mg/L)	20.7	158	174
Aluminum (ug/L)	1340	< 200	1150
Ammonia (mg/L)	< .05	< .05	1.2
Arsenic (ug/L)	< 2	< 2	2.1
Barium (ug/L)	30	42	116
Cadmium (ug/L)	< .2	< .2	< .2
Calcium (mg/L)	89.8	70.3	60.6
Chloride (mg/L)	10.2	18	16.9
Chromium (ug/L)	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	34	38
Conductivity (umhos/cm)	887	652	566
Copper, Low Level (ug/L)	< 2	< 2	< 2
Hardness, Total (mg/L)	443	323	275
Iron (ug/L)	2110	742	3150
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	53.2	35.7	30
Manganese (ug/L)	568	933	4430
Nickel (ug/L)	12	4.5	5.6
Nitrate, nitrite (mg/L)	.12	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02
Potassium (mg/L)	5.1	3.7	5.5
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	15.2	21.8	18.6
Solids, Total Dissolved (mg/L)	670	444	368
Strontium (ug/L)	322	309	256
Sulfate (mg/L)	403	166	114
TKN (mg/L)	.52	.83	2.76
Total Phosphorus (mg/L)	.095	.046	.193
Total Suspended Solids (mg/L)	27	14	47
Zinc (ug/L)	16	< 10	10
CorrectedConductance(umhos/cm)	901	637	678
DissolvedOxygen(mg/L)	7.13	6.01	3.25
pH(su)	8.15	7.34	8.74
Saturation(percent)	80.4	68.4	34.6
Temperature(deg C)	21.14	21.64	18.3
UncorrectedConductance(umhos/cm)	835	596	591

River Code:	**09-507-000**	Stream:	**CLAYLICK RUN**
River Mile:	**0.4**	Location:	CLAYLICK RUN SW OF NORTHUP @ LINCLON PIKE
Basin:	Southeast Ohio River Tribs	Drainage:	7.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	121	128	124	134
Aluminum (ug/L)	< 200	< 200	274	< 200
Ammonia (mg/L)	.051	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	54	53	52	54
Bromide (ug/L)			26.2	
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	70.8	67.1	64.9	73.8
Chloride (mg/L)	< 5	6.8	< 5	6.7
Chromium (ug/L)	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	535	513	487	524
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	246	232	223	250
Iron (ug/L)	106	60	443	121
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	16.7	15.7	14.9	16
Manganese (ug/L)	70	78	53	97
Nickel (ug/L)	< 2	< 2	< 2	< 2
Nitrate, nitrite (mg/L)	.28	.14	.39	.29
Nitrite (mg/L)	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.9	3.3	3.1	3.7
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.7	16.2	12.9	16.4
Solids, Total Dissolved (mg/L)	344	334	324	338
Strontium (ug/L)	314	296	279	307
Sulfate (mg/L)	149	124	121	118
TKN (mg/L)	< .2	< .2	.22	.3
Total Phosphorus (mg/L)	.013	.012	.022	.012
Total Suspended Solids (mg/L)	< 5	< 5	6	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	524	520	494	520
DissolvedOxygen(mg/L)	7.15	7.07	7.7	8.24
pH(su)	7.68	7.43	7.56	7.82
Saturation(percent)	81.2	80.9	91.6	99.2
Temperature(deg C)	21.52	22.01	24.03	24.66
UncorrectedConductance(umhos/cm)	489	490	485	517

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**33.3**	Location:	LAKE RUPERT, L-1
Basin:	Southeast Ohio River Tribs	Drainage:	22.2 sq mi

Sample Type: Inorganic	**06-22-2017**	**07-25-2016**	**08-18-2016**	**11-17-2016**
Alkalinity (mg/L)	31.2	52.1	35.8	39.3
Aluminum (ug/L)	< 200	< 200	< 200	< 200
Ammonia (mg/L)	< .05	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	18.6	47	16	23
Bicarbonate (mg/L)	31.2	52.1	35.8	39.3
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	14.4	15.7	12.8	14.3
Carbonate (mg/L)	< 5	< 5	< 5	< 5
Chloride (mg/L)	< 5	5.8	5	6
Chlorophyll_a (ug/L)	6.6		22.4	19.1
Chromium (ug/L)	< 2	< 2	< 2	< 2
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	55.4	61	50	55
Iron (ug/L)	78.7	206	78	144
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	4.7	5.3	4.4	4.6
Manganese (ug/L)	155	6320	156	119
Nickel (ug/L)	< 2	2	< 2	< 2
Nitrate, nitrite (mg/L)	< .1	< .1	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	.0019	.0031	.0031	.0058
Pheophytin_a (ug/L)	4.74		8.7	< .9
Potassium (mg/L)	< 2	2	< 2	< 2
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	< 5	5.7	< 5	5.7
Solids, Total Dissolved (mg/L)	86	106	84	50
Strontium (ug/L)	54.7	64	51	55
Sulfate (mg/L)	28.7	23.9	18.7	19.5
TKN (mg/L)	.256	.57	.4	.38
TOC (mg/L)	5.03	4.34	5.15	3.67
Total Phosphorus (mg/L)	.0189	.0166	.0198	.0103
Total Suspended Solids (mg/L)	< 5	6	< 5	< 5
Turbidity (NTU)	3.13	7.18	2.97	3.26
Zinc (ug/L)	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	143	205	138	0
DissolvedOxygen(mg/L)	7.76	.83	7.65	9.45
pH(su)	8.21	6.22	7.18	7.47
SampleDepth(ft)				6
SampleDepth(m)	.5	5.5	.5	.5
Saturation(percent)	97.74	8.3	97.3	82.2
SecchiDiskDepth(m)	1.3		1.38	1.51
Temperature(deg C)	27.22	15.55	27.75	10.7

Sample Type: Inorganic	**06-22-2017**	**07-25-2016**	**08-18-2016**	**11-17-2016**
UncorrectedConductance(umhos/cm)	149	168	145	

River Code:	**09-510-006**	Stream:	**LAKE ALMA**
River Mile:		Location:	LAKE ALMA, L-1
Basin:	Southeast Ohio River Tribs	Drainage:	sq mi

Sample Type: Inorganic	**07-25-2016**	**08-18-2016**	**11-03-2016**
Alkalinity (mg/L)	45	51.5	59.4
Aluminum (ug/L)	< 200	< 200	< 200
Ammonia (mg/L)	< .05	< .05	.142
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	20	27	40
Bicarbonate (mg/L)	45	51.5	59.4
Cadmium (ug/L)	< .2	< .2	< .2
Calcium (mg/L)	30.2	33.3	33.9
Carbonate (mg/L)	< 5	< 5	< 5
Chloride (mg/L)	< 5	< 5	< 5
Chlorophyll_a (ug/L)		32.2	
Chromium (ug/L)	< 2	< 2	< 2
Copper, Low Level (ug/L)	< 2	< 2	< 2
Hardness, Total (mg/L)	107	116	117
Iron (ug/L)	< 50	< 50	88
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	7.7	8.1	7.9
Manganese (ug/L)	112	519	779
Nickel (ug/L)	< 2	< 2	2.2
Nitrate, nitrite (mg/L)	< .1	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .001	.0016	.0028
Pheophytin_a (ug/L)		6.4	
Potassium (mg/L)	< 2	< 2	< 2
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	< 5	< 5	< 5
Solids, Total Dissolved (mg/L)	164	180	160
Strontium (ug/L)	91	96	97
Sulfate (mg/L)	67.9	58	61.5
TKN (mg/L)	.49	.5	.6
TOC (mg/L)	3.56	3.88	4.45
Total Phosphorus (mg/L)	.0087	.0123	.0084
Total Suspended Solids (mg/L)	< 5	< 5	< 5
Turbidity (NTU)	1.68	5.74	2.92
Zinc (ug/L)	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	272	270	265
DissolvedOxygen(mg/L)	1.24	8.75	8.79
pH(su)	6.66	7.47	7.44
SampleDepth(m)	4	4	3
Saturation(percent)	15.1	114	89.5
Temperature(deg C)	25.31	27.25	16.22
UncorrectedConductance(umhos/cm)	273	283	220

River Code:	**09-533-000**	Stream:	**WOLF RUN**
River Mile:	**3.8**	Location:	WOLF RUN SE OF MCARTHUR @ CO. RD. 24
Basin:	Southeast Ohio River Tribs	Drainage:	4.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	78.9	111	86.6	68.4	121
Aluminum (ug/L)	< 200	250	< 200	< 200	< 200
Ammonia (mg/L)	.11	.095	.165	.093	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	26	24	40	37	27
Bromide (ug/L)		41.7	35		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	37.8	37.3	38.5	34.8	38.1
Chloride (mg/L)	15.2	23	13.4	13.5	31.1
Chlorophyll_a (ug/L)		7.1			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	38	< 20	25	24	27
Conductivity (umhos/cm)	372	342	352	344	412
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	153	130	155	137	156
Iron (ug/L)	1550	1030	2350	1430	404
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	14.3	12.6	14.4	12.1	14.7
Manganese (ug/L)	1090	917	1190	591	430
Nickel (ug/L)	5.7	4.3	5.3	4	3.1
Nitrate, nitrite (mg/L)	< .1	.11	.17	.11	.13
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		4.3			
Potassium (mg/L)	2.3	3.4	2.8	3	3.7
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	13	17.5	12.5	11.4	21.8
Solids, Total Dissolved (mg/L)	268	210	244	296	260
Strontium (ug/L)	126	132	126	112	130
Sulfate (mg/L)	84	50.1	75.5	75.9	50.1
TKN (mg/L)	.55	.65	.72	.76	.66
Total Phosphorus (mg/L)	.026	.034	.034	.036	.028
Total Suspended Solids (mg/L)	18	22	< 5	< 5	< 5
Zinc (ug/L)	27	< 10	< 10	10	< 10
CorrectedConductance(umhos/cm)	379	396	373	353	465
DissolvedOxygen(mg/L)	5.74	5.37	5.59	5.83	5.88
pH(su)	7.82	7.23	7.45	7.94	7.5
Saturation(percent)	66.7	60	68.2	71	67.3
Temperature(deg C)	22.76	20.72	25.38	25.26	22.02
UncorrectedConductance(umhos/cm)	362	364	376	355	438

River Code:	**09-542-000**	Stream:	**BARREN CREEK**
River Mile:	**0.3**	Location:	BARREN CREEK N OF HARRISBURG, NEAR MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	9.1 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	115	136	92.4	125	126
Aluminum (ug/L)	< 200	367	550	492	< 200
Ammonia (mg/L)	.257	.203	.076	.178	.136
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	63	80	62	84	57
Bromide (ug/L)			23.6		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	38.3	44.1	32.1	43.4	35.4
Chloride (mg/L)	20.7	25.1	15.4	21.7	24.8
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	26	23	24	< 20
Conductivity (umhos/cm)	336	382	286	371	327
Copper, Low Level (ug/L)	< 2	< 2	2.5	< 2	< 2
Hardness, Total (mg/L)	131	151	109	144	120
Iron (ug/L)	808	1000	1190	846	342
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	8.7	10	7	8.7	7.7
Manganese (ug/L)	455	824	151	485	87
Nickel (ug/L)	< 2	2.2	2.2	2.1	< 2
Nitrate, nitrite (mg/L)	.9	.96	1.25	1.4	.59
Nitrite (mg/L)	.099	.053	< .02	.065	.041
Potassium (mg/L)	4.8	6	4.4	7	8.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	15.1	18.3	11	15	15.7
Solids, Total Dissolved (mg/L)	198	202	200	242	200
Strontium (ug/L)	154	173	125	158	133
Sulfate (mg/L)	28.1	24	29.9	30	14.5
TKN (mg/L)	.66	.8	.74	.88	.68
Total Phosphorus (mg/L)	.049	.069	.095	.079	.037
Total Suspended Solids (mg/L)	6	14	20	14	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	336	390	293	372	344
DissolvedOxygen(mg/L)	10.39	5.23	7.07	5.19	5.9
pH(su)	7.7	8.1	7.03	7.65	6.9
Saturation(percent)	115.7	59.3	82.7	61	62.6
Temperature(deg C)	20.58	21.44	23.13	23.33	18.13
UncorrectedConductance(umhos/cm)	307	363	282	360	299

River Code:	**09-547-000**	Stream:	**WILLIAMS RUN**
River Mile:	**0.1**	Location:	WILLIAMS RUN SE OF WILKESVILLE @ MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	3.8 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	127	143	102	125	208
Aluminum (ug/L)	207	246	415	< 200	< 200
Ammonia (mg/L)	.091	.235	.112	.053	.567
Arsenic (ug/L)	< 2	< 2	< 2	< 2	3.1
Barium (ug/L)	45	69	45	38	79
Bromide (ug/L)			28.9		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	48.2	62.1	37.3	40.7	48.9
Chloride (mg/L)	21	39.9	16.1	17	17.7
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	28
Conductivity (umhos/cm)	403	532	312	360	425
Copper, Low Level (ug/L)	< 2	2	< 2	< 2	< 2
Hardness, Total (mg/L)	164	211	128	138	167
Iron (ug/L)	414	926	756	327	590
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	10.5	13.7	8.4	8.8	10.8
Manganese (ug/L)	288	1640	159	337	4320
Nickel (ug/L)	< 2	< 2	< 2	< 2	2.4
Nitrate, nitrite (mg/L)	.26	.1	.81	.32	< .1
Nitrite (mg/L)	< .02	< .02	.041	< .02	< .02
Potassium (mg/L)	3.8	5.3	4.9	4.4	6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	17.2	20.9	14.5	16.4	19.4
Solids, Total Dissolved (mg/L)	252	330	198	242	246
Strontium (ug/L)	199	244	144	160	196
Sulfate (mg/L)	51.8	71.2	36.8	34.7	11.7
TKN (mg/L)	.34	.61	.69	.44	1.19
Total Phosphorus (mg/L)	.067	.06	.1	.052	.058
Total Suspended Solids (mg/L)	6	17	7	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	395	522	311	370	421
DissolvedOxygen(mg/L)	6.47	4.55	6.43	6.07	3.93
pH(su)	7.71	7.58	7.58	7.63	7.48
Saturation(percent)	74.2	51.8	74.6	72.8	47.4
Temperature(deg C)	22.06	21.67	22.66	24.48	24.78
UncorrectedConductance(umhos/cm)	373	489	298	366	419

River Code:	**09-556-000**	Stream:	**LONG RUN**
River Mile:	**1.4**	Location:	LONG RUN N OF VALES MILLS, ADJ CO. RD. 11K
Basin:	Southeast Ohio River Tribs	Drainage:	2.2 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	61.5	79	72.4	77.5	87.9
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	< .05	.059	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	36	45	41	42	43
Bromide (ug/L)			54		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	26.3	30.6	29.6	29.6	31.5
Chloride (mg/L)	12.8	12.2	13.6	13.1	14.4
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	126	< 20	< 20
Conductivity (umhos/cm)	239	263	250	272	265
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	93	105	104	103	109
Iron (ug/L)	154	493	246	320	639
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	6.7	6.9	7.3	7	7.3
Manganese (ug/L)	158	781	219	311	537
Nickel (ug/L)	< 2	< 2	< 2	< 2	< 2
Nitrate, nitrite (mg/L)	< .1	< .1	.11	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2	< 2	< 2	< 2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.7	7.9	9.3	8.7	8.8
Solids, Total Dissolved (mg/L)	158	170	164	200	174
Strontium (ug/L)	133	137	145	141	140
Sulfate (mg/L)	44.2	33.4	33.6	32.7	30.5
TKN (mg/L)	< .2	< .2	< .2	.26	.79
Total Phosphorus (mg/L)	.01	.011	< .01	.016	.514
Total Suspended Solids (mg/L)	< 5	6	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	272	264	254	274	272
DissolvedOxygen(mg/L)	8.05	7.18	6.23	6.93	5.99
pH(su)	7.84	7.86	7.54	7.65	7.5
Saturation(percent)	82	77.2	76	86.1	69.7
Temperature(deg C)	16.25	18.83	25.41	26.42	22.94
UncorrectedConductance(umhos/cm)	227	233	256	281	261

River Code:	**09-568-000**	Stream:	**SANDY RUN**
River Mile:	**0.4**	Location:	LAKE HOPE, L-1
Basin:	Southeast Ohio River Tribs	Drainage:	11.4 sq mi

Sample Type: Inorganic	**07-25-2016**	**08-10-2016**	**09-06-2016**	**09-29-2016**
Alkalinity (mg/L)	26.3	22.8	26.3	50.3
Aluminum (ug/L)	< 200	< 200	< 200	< 200
Ammonia (mg/L)	< .05	< .05	.096	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	52	75	26	108
Bicarbonate (mg/L)	26.3	22.8	26.3	50.3
Cadmium (ug/L)	< .2	< .2	.25	< .2
Calcium (mg/L)	9.9	11.2	12.7	10.5
Carbonate (mg/L)	< 5	< 5	< 5	< 5
Chloride (mg/L)	8.3	9.4	9.5	10.2
Chlorophyll_a (ug/L)		13.7	11.2	8.9
Chromium (ug/L)	< 2	< 2	< 2	< 2
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	42	46	51	45
Iron (ug/L)	566	492	2650	5780
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	4.1	4.4	4.6	4.5
Manganese (ug/L)	2150	41	54	402
Nickel (ug/L)	2.5	< 2	2.3	< 2
Nitrate, nitrite (mg/L)	< .1	< .1	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)		< 2.8	< 2.8	5
Potassium (mg/L)	< 2	< 2	< 2	< 2
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	7	8	7.4	8.7
Solids, Total Dissolved (mg/L)	90	94	92	110
Strontium (ug/L)	50	52	61	54
Sulfate (mg/L)	23.7	25.6	19.1	23.9
TKN (mg/L)	.37	.32	.59	.59
TOC (mg/L)	4.48	4.8	4.06	3.97
Total Phosphorus (mg/L)	.021	.017	.041	.015
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5
Turbidity (NTU)	3.08	1.44	10.4	6.67
Zinc (ug/L)	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	161	182	214	144
DissolvedOxygen(mg/L)	.31	1.08	.85	1.46
pH(su)	5.74	6.11	5.65	6.29
SampleDepth(m)	5.5	.5	.5	.5
Saturation(percent)	2.9	10.2	97.1	66.3
SecchiDiskDepth(m)			2.96	1.57
Temperature(deg C)	12.94	12.93	13.75	14.92
UncorrectedConductance(umhos/cm)	124	158	153	136

River Code:	**09-568-000**	Stream:	**SANDY RUN**
River Mile:	**2.7**	Location:	SANDY RUN UPST. LAKE HOPE @ KING HOLLOW TRAIL
Basin:	Southeast Ohio River Tribs	Drainage:	5.0 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	15.8	26.4	20	23.9	41.4
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.066	.135	.054	.077	.056
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	39	46	42	42	38
Bromide (ug/L)			< 20		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	17.5	18.8	20.1	19.9	20.8
Chloride (mg/L)	23.4	34.5	24.7	32.8	40.4
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	253	285	266	310	280
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	72	75	82	79	79
Iron (ug/L)	502	1170	612	853	1110
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	6.8	6.7	7.7	7.1	6.5
Manganese (ug/L)	402	775	415	498	628
Nickel (ug/L)	4.2	3.6	3.2	2.6	2.8
Nitrate, nitrite (mg/L)	.1	.11	.15	.11	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	< 2	2	< 2	2.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	15.2	21.1	18.3	20.2	25.9
Solids, Total Dissolved (mg/L)	150	182	180	196	180
Strontium (ug/L)	83	90	93	90	95
Sulfate (mg/L)	60.2	55.3	62.8	64.9	35.1
TKN (mg/L)	< .2	.28	.25	< .2	.21
Total Phosphorus (mg/L)	< .01	.016	.01	.011	.01
Total Suspended Solids (mg/L)	< 5	< 10	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	239	288	280	310	271
DissolvedOxygen(mg/L)	8.77	6.22	8.6	7.05	4.89
pH(su)	7.6	7.59	7.93	7.39	7.02
Saturation(percent)	93.5	67	94.1	80.3	52.7
Temperature(deg C)	18.41	18.97	19.73	21.73	18.91
UncorrectedConductance(umhos/cm)	209	255	252	290	240

River Code:	**09-566-000**	Stream:	**PINE RUN**
River Mile:	**0.1**	Location:	PINE RUN NW OF MINERAL @ MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	2.0 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-05-2016**	**07-27-2016**	**08-29-2016**	**09-21-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	31.7	44.1	26.4	40.1	47	55.6
Aluminum (ug/L)	447	245	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.095	.101	< .05	.126	.072	.084
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	35	16	33	27	19	18
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	8.6	8.7	8.2	9.1	11.6	10.6
Chloride (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	22	30	202	< 20	< 20	< 20
Conductivity (umhos/cm)	104	109	93	114	114	122
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	38	40	36	40	50	46
Iron (ug/L)	4690	4950	3020	4130	2780	2230
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	4.1	4.4	3.7	4.2	5.1	4.7
Manganese (ug/L)	1530	1060	687	679	578	392
Nickel (ug/L)	2.9	2.4	2.7	< 2	< 2	< 2
Nitrate, nitrite (mg/L)	< .1	< .1	< .1	< .1	.14	.16
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	< 2	< 2	< 2	< 2	2.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	< 5	< 5	< 5	< 5	5.1	< 5
Solids, Total Dissolved (mg/L)	76	86	74	92	94	82
Strontium (ug/L)	47	47	43	48	61	53
Sulfate (mg/L)	16.8	7.7	16.5	10.3	11	6.4
TKN (mg/L)	.36	.52	.86	.52	.83	.39
Total Phosphorus (mg/L)	.054	.053	.074	.041	.02	.012
Total Suspended Solids (mg/L)	36	9	8	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	100	106	94	113	115	129
DissolvedOxygen(mg/L)	7.22	9.58	8.57	7.59	8.81	9.38
pH(su)	7.5	7.92	7.82	7.9	7.71	7.79
Saturation(percent)	83.1	112.3	98.9	92.2	107.7	102.6
Temperature(deg C)	22.34	23.27	22.48	25.2	25.53	19.68
UncorrectedConductance(umhos/cm)	95	102	90	113	116	116

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**104.6**	Location:	RACCOON CREEK DST. MITCHELL HOLLOW @ ST. RT. 328
Basin:	Southeast Ohio River Tribs	Drainage:	56.4 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	23.4	35.2	33.8	35.3	59.1
Aluminum (ug/L)	< 200	< 200	249	< 200	< 200
Ammonia (mg/L)	.051	.067	.058	.054	.111
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	33	44	43	39	53
Bromide (ug/L)		52	41.2		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	33.8	50.8	55.8	56	59.7
Chloride (mg/L)	9.8	15.5	14.2	15.3	26.9
Chlorophyll_a (ug/L)		4.6			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	345	515	521	598	582
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	152	221	246	241	269
Iron (ug/L)	458	464	573	311	733
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	16.3	22.8	25.8	24.5	29.2
Manganese (ug/L)	993	900	999	533	1800
Nickel (ug/L)	11.3	5.8	10.8	6.7	10.6
Nitrate, nitrite (mg/L)	.11	.12	.16	.2	.13
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		< 1.4			
Potassium (mg/L)	< 2	2.6	3.1	3.1	4.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.9	11.8	12.4	11.9	20.6
Solids, Total Dissolved (mg/L)	254	342	362	420	426
Strontium (ug/L)	129	179	205	190	277
Sulfate (mg/L)	125	182	197	230	195
TKN (mg/L)	< .2	< .2	.21	< .2	< .2
Total Phosphorus (mg/L)	.011	.014	< .01	.013	< .01
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	11	< 10	11	< 10	< 10
CorrectedConductance(umhos/cm)	359	511.9	527	598	650
DissolvedOxygen(mg/L)	8.75	5.56	6.95	6.03	5.82
pH(su)	7.1	7.19	7.76	7.1	7.29
Saturation(percent)	93.6	64.6	80.3	78.2	67.1
Temperature(deg C)	18.54	22.8	22.46	28.69	22.31
UncorrectedConductance(umhos/cm)	315		502	641	616

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**111.4**	Location:	RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328
Basin:	Southeast Ohio River Tribs	Drainage:	42.8 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**	**06-22-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	20.1	17.6	14.4	17.4	19.9	24.6	34.4
Aluminum (ug/L)	459	500	746	610	< 200	237	< 200
Ammonia (mg/L)	< .05	< .05	< .05	< .05	< .05	< .05	.077
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	37	30	31	31	35	34	39
Bromide (ug/L)	39.8	24.3	34.9	23.3	28		44.5
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	30.1	33.6	22.1	17.1	51.3	22.7	67.9
Chloride (mg/L)	16.3	14.4	21	8.4	10.4	9.1	16.4
Chlorophyll_a (ug/L)							4.6
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	148	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	346	359	285	211	456	253	619
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	134	143	99	77	217	105	286
Iron (ug/L)	942	536	616	587	375	597	402
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	14.3	14.4	10.6	8.3	21.7	11.7	28.2
Manganese (ug/L)	1940	1110	974	809	1500	1220	916
Nickel (ug/L)	20.2	15.4	14.3	12.9	18	12.8	5.9
Nitrate, nitrite (mg/L)	.21	.38	.26	.15	.16	.12	.13
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)							< 1.4
Potassium (mg/L)	< 2	< 2	< 2	< 2	2.1	2	3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	10.7	10	11	6.5	9.7	8.2	13
Solids, Total Dissolved (mg/L)	222	236	180	146	316	192	426
Strontium (ug/L)	110	112	79	70	155	99	209
Sulfate (mg/L)	119	126	84.6	64	191	80.6	246
TKN (mg/L)	< .2	.25	< .2	< .2	< .2	.27	.21
Total Phosphorus (mg/L)	< .01	.011	< .01	< .01	.019	.013	.012
Total Suspended Solids (mg/L)	< 5	7	11	11	< 5	< 5	< 5
Zinc (ug/L)	41	24	26	22	20	19	< 10
CorrectedConductance(umhos/cm)	347	389	277	213	466.6	262	614
DissolvedOxygen(mg/L)	16.31	13.54	17.11	11.14	8.39	8.02	5.31
pH(su)	6.91	7.88	7.55	7.56	6.84	7.21	6.77
Saturation(percent)	116.9	117.8	122.6	100.4	86.1	86.1	60.9
Temperature(deg C)	1.62	9.2	1.63	10.71	16.5	18.73	22
UncorrectedConductance(umhos/cm)	192	272	153	155		231	

Sample Type: Inorganic	07-07-2016	08-03-2016	09-14-2016	10-17-2016	12-13-2016
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	24.8	34.1	89.1	47.2	12.7
Aluminum (ug/L)	< 200	206	< 200	< 200	< 200
Ammonia (mg/L)	.062	.062	.301	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	41	35	44	36	30
Bromide (ug/L)	41.3				
Cadmium (ug/L)	< .2	< .2	< .2	< .2	.22
Calcium (mg/L)	82.6	84.6	91.3	93.5	90.4
Chloride (mg/L)	15.5	14.3	66.2	25.1	24.9
Chlorophyll_a (ug/L)					
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	674	743	892	811	822
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	346	349	363	396	386
Iron (ug/L)	290	690	2190	382	156
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	34	33.5	32.9	39.4	38.8
Manganese (ug/L)	1900	886	4450	621	3000
Nickel (ug/L)	14.5	7.6	8.8	5.5	22.4
Nitrate, nitrite (mg/L)	.14	.22	< .1	< .1	.18
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)					
Potassium (mg/L)	3.3	3.5	4.1	46.7	3.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.2	13.2	54.8	20.9	18.8
Solids, Total Dissolved (mg/L)	496	540	642	614	614
Strontium (ug/L)	249	238	285	278	252
Sulfate (mg/L)	300	309	274	373	379
TKN (mg/L)	< .2	.27	.63	.4	< .2
Total Phosphorus (mg/L)	< .01	.018	.013	.012	.01
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	11	< 10	30
CorrectedConductance(umhos/cm)	686	738	975	809	829
DissolvedOxygen(mg/L)	7.06	8.35	5.86	6.2	14.21
pH(su)	7.89	7	7.29	7.42	9.01
Saturation(percent)	80.9	102.8	64	63.3	105
Temperature(deg C)	22.01	25.83	19.47	16.26	2.69
UncorrectedConductance(umhos/cm)	647	750	872	674	476

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**89.4**	Location:	RACCOON CREEK DST. HEWETT FORK @ CO. RD. 18 B
Basin:	Southeast Ohio River Tribs	Drainage:	176.0 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**	**06-22-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	27.7	19.6	16.4	17.8	22.6	25	34.6
Aluminum (ug/L)	< 200	367	1050	649	< 200	< 200	< 200
Ammonia (mg/L)	.093	.05	.067	< .05	< .05	.061	.162
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	36	30	35	32	34	31	40
Bromide (ug/L)	35.6	< 20	25.5	< 40	22.9		47.8
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	32.6	21.6	20.7	17.6	27	24.9	40.2
Chloride (mg/L)	17	11.7	24.5	8.2	9.8	9.1	15.3
Chlorophyll_a (ug/L)							1
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	336	251	276	204	288	273	447
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	139	93	90	76	115	110	172
Iron (ug/L)	578	686	2310	983	515	520	501
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	14	9.5	9.2	7.7	11.5	11.6	17.3
Manganese (ug/L)	1350	730	829	553	849	766	543
Nickel (ug/L)	12.5	9.3	9.4	8.1	8.9	7.1	3.2
Nitrate, nitrite (mg/L)	.18	.37	.25	.14	.11	.12	.18
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)							< 1.4
Potassium (mg/L)	< 2	< 2	< 2	< 2	< 2	< 2	2.4
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	11.4	8.6	13.4	6.7	8.7	8.8	12.8
Solids, Total Dissolved (mg/L)	230	156	174	142	182	204	310
Strontium (ug/L)	120	86	77	72	109	107	172
Sulfate (mg/L)	116	73.7	71.8	64.5	94.7	87.6	140
TKN (mg/L)	.31	.33	< .2	< .2	< .2	< .2	.28
Total Phosphorus (mg/L)	< .01	< .01	.038	< .01	.021	.016	.011
Total Suspended Solids (mg/L)	< 5	5	52	17	< 5	< 5	< 5
Zinc (ug/L)	30	12	22	11	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	362	260	270	210	292.7	284	426.8
DissolvedOxygen(mg/L)	16.87	15.34	19.93	9.71	8.24	7.83	5.79
pH(su)	7.45	6.71	7.49	7.32	7.02	7.48	6.96
Saturation(percent)	119.9	130.3	145	91.1	85.7	82.9	66.2
Temperature(deg C)	1.32	8.2	2.21	12.44	17.2	18.08	22
UncorrectedConductance(umhos/cm)	198	176	153	160		246	

Sample Type: Inorganic	07-07-2016	08-03-2016	09-14-2016	10-17-2016	12-13-2016
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	36	41	54.7	53.5	30
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.071	.067	< .05	.057	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	37	34	37	38	36
Bromide (ug/L)	37.2				
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	39.4	34.9	48.2	51.7	59.7
Chloride (mg/L)	12.5	12.6	12.7	12.4	17.8
Chlorophyll_a (ug/L)					
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	23
Conductivity (umhos/cm)	382	383	431	464	600
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	171	149	195	195	261
Iron (ug/L)	671	654	491	510	449
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	17.7	15	18.1	16.1	27.1
Manganese (ug/L)	636	334	589	308	458
Nickel (ug/L)	5	2.9	2.7	2.8	6.6
Nitrate, nitrite (mg/L)	.22	.21	.15	.13	.35
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)					
Potassium (mg/L)	2.7	2.5	3.6	4	3.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	11.6	11.1	15.3	15.2	16.8
Solids, Total Dissolved (mg/L)	264	262	310	314	428
Strontium (ug/L)	154	147	207	215	223
Sulfate (mg/L)	130	104	127	163	234
TKN (mg/L)	.24	.35	.25	.36	.28
Total Phosphorus (mg/L)	< .01	.013	.011	< .01	.015
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	385	382	468	460	605
DissolvedOxygen(mg/L)	6.85	5.61	5.71	7.55	15.35
pH(su)	7.92	7.09	7.19	8.02	8.43
Saturation(percent)	78.5	67.1	64.9	74.9	113.5
Temperature(deg C)	22.05	24.28	21.62	14.97	2.78
UncorrectedConductance(umhos/cm)	363	377	438	372	348

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**90.0**	Location:	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.
Basin:	Southeast Ohio River Tribs	Drainage:	136.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	20.4	33.2	30.4	32	51.3
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.057	.089	.07	.065	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	31	38	37	32	33
Bromide (ug/L)			40.1		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	23.7	38.4	38.3	32.6	41.1
Chloride (mg/L)	11.1	17.2	13.7	15.9	16.5
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	277	453	391	418	429
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	108	179	174	150	190
Iron (ug/L)	415	457	574	498	474
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	11.9	20.3	19	16.7	21.1
Manganese (ug/L)	880	631	735	385	753
Nickel (ug/L)	8.7	3.7	5.2	3.3	2.9
Nitrate, nitrite (mg/L)	.15	.2	.16	.24	.16
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.7	2.7	2.4	3.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.2	12.9	11.4	10.5	14.7
Solids, Total Dissolved (mg/L)	202	284	264	278	312
Strontium (ug/L)	96	162	148	135	175
Sulfate (mg/L)	93.3	150	131	127	126
TKN (mg/L)	.21	< .2	.62	< .2	< .2
Total Phosphorus (mg/L)	.011	.012	.014	.013	< .01
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	289	445	397	409	480
DissolvedOxygen(mg/L)	7.81	6.98	6.4	5.44	5.88
pH(su)	7.34	7.56	7.77	7.11	7.41
Saturation(percent)	82.5	81.3	73.5	65.5	69.8
Temperature(deg C)	17.98	22.92	22.16	24.66	23.86
UncorrectedConductance(umhos/cm)	250	427	375	407	469

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**30.0**	Location:	WELLSTON PWS NORTH PLANT INTAKE FROM L RACCOON CREEK
Basin:	Southeast Ohio River Tribs	Drainage:	36.1 sq mi

Sample Type: Inorganic	**04-12-2016**	**04-27-2016**	**05-11-2016**	**06-07-2016**	**06-23-2016**
Ammonia (mg/L)	< .05	< .05	.071	.147	.28
Nitrate, nitrite (mg/L)	.18	.1	.12	.11	.2
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01
Total Phosphorus (mg/L)	< .01	.026	.021	.023	.044
CorrectedConductance(umhos/cm)	273	342	237	290	323
DissolvedOxygen(mg/L)	11.4	8.16	9.69	4.95	4.77
pH(su)	7.62	7.81	7.55	7.65	7.9
Saturation(percent)	103	84.7	99.3	57	54.1
Temperature(deg C)	10.8	17.09	16.55	22.31	21.58
UncorrectedConductance(umhos/cm)	199	290	199	275	302

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**22.0**	Location:	RACCOON CREEK ADJ. DAN JONES RD
Basin:	Southeast Ohio River Tribs	Drainage:	615.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	42.4	163	66	51.4	85
Aluminum (ug/L)	334	< 200	482	396	< 200
Ammonia (mg/L)	< .05	.305	< .05	< .05	< .05
Arsenic (ug/L)	< 2	2.6	< 2	< 2	< 2
Barium (ug/L)	35	137	50	35	76
BOD5 (mg/L)	7.3	5.9	8.9	< 2	< 2
Bromide (ug/L)			45.6		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	31	43.2	44	32	56.9
Chloride (mg/L)	12.2	20.9	15.8	13.7	36.3
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	23	< 20	< 20	< 20
Conductivity (umhos/cm)	323	380	434	333	627
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	126	140	169	121	220
Iron (ug/L)	929	4120	1240	1090	430
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	11.9	7.8	14.3	9.9	19
Manganese (ug/L)	222	5180	245	248	639
Nickel (ug/L)	2.6	< 2	3.1	3.5	3.3
Nitrate, nitrite (mg/L)	.22	< .1	.51	.33	.29
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01			< .01	
Potassium (mg/L)	2.3	4.3	4	3.1	4.7
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.7	16.1	23.6	14.9	46.3
Solids, Total Dissolved (mg/L)	246	180	290	208	410
Strontium (ug/L)	167	163	254	161	410
Sulfate (mg/L)	101	10.4	126	80.7	172
TKN (mg/L)	.3	.66	.29	.33	< .2
TOC (mg/L)	2.14	2.98	3.41	4.52	3.47
Total Phosphorus (mg/L)	.023	.035	.039	.039	< .01
Total Suspended Solids (mg/L)	31	10	19	25	11
Zinc (ug/L)	15	< 10	< 10	10	< 10
CorrectedConductance(umhos/cm)	321	377	437	169	655
DissolvedOxygen(mg/L)	10.65	3.94	7.25	10.04	6.12
pH(su)	7.92	6.88	7.89	7.82	7.93
Saturation(percent)	113.9	44	85.6	124.3	72
Temperature(deg C)	18.61	20.78	23.63	26.21	23.42
UncorrectedConductance(umhos/cm)	282	347	426	173	635

River Code:	**09-500-012**	Stream:	**BIG BEAVER CREEK**
River Mile:	**0.9**	Location:	BIG BEAVER CREEK AT GUTHRE RD. S. OF RIO GRANDE
Basin:	Southeast Ohio River Tribs	Drainage:	7.3 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	86.9	102	90.7	118
Aluminum (ug/L)	< 200	< 200	294	< 200
Ammonia (mg/L)	.124	.054	.061	.085
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	53	66	50	59
Bromide (ug/L)			28.7	
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	25.9	26.2	28.9	35.3
Chloride (mg/L)	10	9.8	8.8	10.5
Chromium (ug/L)	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	34
Conductivity (umhos/cm)	227	243	234	288
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	90	89	97	115
Iron (ug/L)	760	2000	835	739
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	6.1	5.6	5.9	6.6
Manganese (ug/L)	412	2350	140	471
Nickel (ug/L)	< 2	< 2	< 2	< 2
Nitrate, nitrite (mg/L)	.21	< .1	.92	.22
Nitrite (mg/L)	.025	< .02	< .02	< .02
Potassium (mg/L)	2.9	2.5	4	4.7
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	9.3	9	7.5	9.3
Solids, Total Dissolved (mg/L)	130	108	204	190
Strontium (ug/L)	102	99	98	116
Sulfate (mg/L)	17.3	10.5	17.4	13.8
TKN (mg/L)	.36	.29	.43	.51
Total Phosphorus (mg/L)	.026	.015	.031	.028
Total Suspended Solids (mg/L)	12	7	7	7
Zinc (ug/L)	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	225	244	142	293
DissolvedOxygen(mg/L)	6.31	10.56	11.38	8.41
pH(su)	7.16	7.17	7.35	7.49
Saturation(percent)	69.6	117	131.5	99.4
Temperature(deg C)	20.15	20.37	22.53	23.71
UncorrectedConductance(umhos/cm)	204	223	135	286

River Code:	**09-528-000**	Stream:	**MCCONNEL RUN**
River Mile:	**2.0**	Location:	MCCONNEL RUN AT LAKE RD (CR 15) N OF LAKE RUPERT
Basin:	Southeast Ohio River Tribs	Drainage:	0.9 sq mi

Sample Type: Inorganic	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**	**09-26-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	36.6	29	32.2	60.3	76.1
Aluminum (ug/L)	299	210	236	< 200	< 200
Ammonia (mg/L)	.144	.06	.069	.093	.318
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	41	33	37	48	50
Bromide (ug/L)		< 20			
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	11.8	10.3	10.5	17.2	18.9
Chloride (mg/L)	7.5	15.3	6.1	< 5	< 5
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	146	120	129	178	193
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	47	42	42	67	73
Iron (ug/L)	2210	1020	1760	2130	2150
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	4.3	4	3.8	5.9	6.2
Manganese (ug/L)	848	344	534	1140	1440
Nickel (ug/L)	3.7	2.7	3.1	2.9	2.9
Nitrate, nitrite (mg/L)	.17	.18	.18	< .1	.1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.1	< 2	3.5	3.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	5.7	6.1	5.5	6.3	6.3
Solids, Total Dissolved (mg/L)	112	88	62	132	136
Strontium (ug/L)	52	46	46	72	75
Sulfate (mg/L)	19.8	225	15.4	23.8	23.7
TKN (mg/L)	.53	.45	.47	.45	1.29
Total Phosphorus (mg/L)	.046	.024	.021	.026	.066
Total Suspended Solids (mg/L)	35	15	19	10	12
Zinc (ug/L)	15	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	179	132	126	179	202
DissolvedOxygen(mg/L)	7.14	6.92	8.05	4.38	2.49
pH(su)	8.11	7.84	7.88	8.17	7.99
Saturation(percent)	72.9	76.2	91.3	44.2	25.3
Temperature(deg C)	16.36	20.06	21.51	15.8	16.16
UncorrectedConductance(umhos/cm)	150	120	118	147	168

River Code:	**09-569-000**	Stream:	**LITTLE SANDY RUN**
River Mile:	**0.4**	Location:	LITTLE SANDY RUN AT ST. RT. 278 SOUTH OF LAKE HOPE
Basin:	Southeast Ohio River Tribs	Drainage:	1.5 sq mi

Sample Type: Inorganic	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	61.1	23.1	50.2	50.2
Aluminum (ug/L)	< 200	529	< 200	757
Ammonia (mg/L)	.064	.057	.096	.091
Arsenic (ug/L)	2	< 2	2.4	2.3
Barium (ug/L)	96	48	74	83
Bromide (ug/L)		< 20		
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	10.4	6.8	9.1	10.6
Chloride (mg/L)	6.6	< 5	5.2	6.7
Chromium (ug/L)	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	38	21	28	39
Conductivity (umhos/cm)	141	90	129	129
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	49	31	40	47
Iron (ug/L)	6820	2510	6370	7500
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	5.5	3.5	4.2	4.9
Manganese (ug/L)	3660	707	2920	2070
Nickel (ug/L)	2.6	2.8	2.4	3
Nitrate, nitrite (mg/L)	< .1	.14	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	< 2	< 2	2.3
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	7.5	< 5	5.3	7.8
Solids, Total Dissolved (mg/L)	106	82	88	92
Strontium (ug/L)	78	50	62	70
Sulfate (mg/L)	< 5	13.2	5.1	7.2
TKN (mg/L)	.6	.45	.68	.84
Total Phosphorus (mg/L)	.068	.05	.056	.098
Total Suspended Solids (mg/L)	21	16	9	50
Zinc (ug/L)	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	149	95	128	124
DissolvedOxygen(mg/L)	2.21	4.93	1.86	2.34
pH(su)	7.2	7.8	7.09	7.71
Saturation(percent)	25.5	56.8	22.4	26.5
Temperature(deg C)	22.54	22.4	24.91	21.35
UncorrectedConductance(umhos/cm)	142	91	128	115

River Code:	**09-510-005**	Stream:	**U.T. TO LITTLE RACCOON CREEK RM 30.65**
River Mile:	**0.2**	Location:	TRIB TO TRIB TO L RACCOON CREEK (30.65/0.10) S. OF LAKE ALMA
Basin:	Southeast Ohio River Tribs	Drainage:	0.1 sq mi

Sample Type: Inorganic	**06-30-2016**	**07-25-2016**
Acidity (mg/L)		< 5
Alkalinity (mg/L)		44
Aluminum (ug/L)		< 200
Ammonia (mg/L)	< .05	< .05
Arsenic (ug/L)		< 2
Barium (ug/L)		55
Cadmium (ug/L)		< .2
Calcium (mg/L)		25.4
Chloride (mg/L)		< 5
Chromium (ug/L)		< 2
COD, Chemical Oxygen Demand (mg/L)		< 20
Conductivity (umhos/cm)		239
Copper, Low Level (ug/L)		< 2
Hardness, Total (mg/L)		100
Iron (ug/L)		104
Lead (ug/L)		< 2
Magnesium (mg/L)		9
Manganese (ug/L)		23
Nickel (ug/L)		2
Nitrate, nitrite (mg/L)	.13	< .1
Nitrite (mg/L)		< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01
Potassium (mg/L)		< 2
Selenium (ug/L)		< 2
Sodium (mg/L)		< 5
Solids, Total Dissolved (mg/L)		156
Strontium (ug/L)		103
Sulfate (mg/L)		60.1
TKN (mg/L)		.43
Total Phosphorus (mg/L)	< .01	.013
Total Suspended Solids (mg/L)		25
Zinc (ug/L)		< 10
CorrectedConductance(umhos/cm)	231	236
DissolvedOxygen(mg/L)	8.3	10.23
pH(su)	7.16	6.87
Saturation(percent)	95.5	117.6
Temperature(deg C)	22.28	22.21
UncorrectedConductance(umhos/cm)	219	223

River Code:	**09-510-006**	Stream:	**LAKE ALMA**
River Mile:		Location:	LAKE ALMA AT BOAT RAMP
Basin:	Southeast Ohio River Tribs	Drainage:	sq mi

Sample Type: Inorganic	**08-18-2016**
Cylindrospermopsin (ug/L)	< .05
Microcystins (ug/L)	< .3
Saxitoxin (ug/L)	.097

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**29.2**	Location:	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35
Basin:	Southeast Ohio River Tribs	Drainage:	586.0 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-07-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	48.2	30.3	29.1	30.7	27.4	40	40.1
Aluminum (ug/L)	< 200	921	2230	444	2200	394	263
Ammonia (mg/L)	.137	.053	.105	.066	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	41	34	48	35	41	37	34
BOD5 (mg/L)							6.6
Bromide (ug/L)	44.8	< 20	25.6	21.9	< 20	28.8	
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	42.3	24.5	28.8	29.3	21.5	34	31.4
Chloride (mg/L)	19	11.9	24.1	13.2	9	11.4	11.6
Chlorophyll_a (ug/L)							
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	422	264	325	289	220	336	323
Copper, Low Level (ug/L)	< 2	< 2	2.8	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	164	96	110	114	85	135	129
Iron (ug/L)	518	2000	5200	1130	3210	1090	850
Lead (ug/L)	< 2	< 2	2.5	< 2	< 2	< 2	< 2
Magnesium (mg/L)	14.1	8.5	9.3	9.9	7.6	12.1	12.3
Manganese (ug/L)	857	430	646	455	293	281	241
Nickel (ug/L)	7.5	6.3	8.6	6.2	6.5	3.9	2.8
Nitrate, nitrite (mg/L)	.41	.46	.47	.31	.26	.2	.21
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)							
Potassium (mg/L)	2.5	2.2	2.2	< 2	2.2	2.3	2.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	20.2	10.7	17.9	12.8	8.9	14.6	15.2
Solids, Total Dissolved (mg/L)	278	168	222	188	156	218	240
Strontium (ug/L)	206	110	133	137	99	175	172
Sulfate (mg/L)	129	72.5	85.1	87.2	63.4	102	103
TKN (mg/L)	.25	.42	.3	< .2	< .2	.28	.24
TOC (mg/L)							< 2
Total Phosphorus (mg/L)	< .01	.048	.078	.021	.053	.037	.014
Total Suspended Solids (mg/L)	< 5	47	150	15	82	18	15
Zinc (ug/L)	< 10	11	24	< 10	16	< 10	22
CorrectedConductance(umhos/cm)	443	276	326	291	224	346	323
DissolvedOxygen(mg/L)	16.76	14.25	17.24	18.6	9.67	7.86	10.04
Flow(cfs)	336	1120	2120	759	2020		287
GageHeight(ft)	4.15	7.42	10.4	6.13	10.14		3.78
pH(su)	7.62	7.36	7.73	7.74	7.68	7.17	7.72
Saturation(percent)	117.9	122.9	122.8	150.8	91.5	82.7	107.9

Sample Type: Inorganic	06-13-2016	06-21-2016	06-22-2016	06-27-2016	07-07-2016	08-03-2016	09-01-2016
Acidity (mg/L)		< 5			< 5	< 5	
Alkalinity (mg/L)		68.5	69.1		67.3	55.1	74.9
Aluminum (ug/L)		229	< 200		516	370	200
Ammonia (mg/L)		< .05	.055		.057	.055	.075
Arsenic (ug/L)		< 2	< 2		< 2	< 2	< 2
Barium (ug/L)		69	68		50	37	79
BOD5 (mg/L)			5.4		9	< 2	< 2
Bromide (ug/L)		94.3			46		
Cadmium (ug/L)		< .2	< .2		< .2	< .2	< .2
Calcium (mg/L)		47.1	44.5		46.2	37.3	48.9
Chloride (mg/L)		27.2	29		15.9	14	31.4
Chlorophyll_a (ug/L)			6.4				
Chromium (ug/L)		< 2	< 2		< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)		< 20	< 20		< 20	< 20	< 20
Conductivity (umhos/cm)		521	547		441	380	547
Copper, Low Level (ug/L)		< 2	< 2		< 2	< 2	< 2
Hardness, Total (mg/L)		188	178		176	143	191
Iron (ug/L)		863	752		1280	1060	784
Lead (ug/L)		< 2	< 2		< 2	< 2	< 2
Magnesium (mg/L)		17.2	16.2		14.8	12.2	16.7
Manganese (ug/L)		407	401		252	260	528
Nickel (ug/L)		3.1	2.8		3.8	3.7	3.1
Nitrate, nitrite (mg/L)		.19	.26		.5	.36	.24
Nitrite (mg/L)		< .02	< .02		< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01	< .01		< .01	< .01	< .01
Pheophytin_a (ug/L)			2.3				
Potassium (mg/L)		3.5	3.2		4.3	3.2	4.2
Selenium (ug/L)		< 2	< 2		< 2	< 2	< 2
Sodium (mg/L)		34.1	32.8		24.2	16	33.9
Solids, Total Dissolved (mg/L)		346	378		292	240	362
Strontium (ug/L)		324	307		269	184	318
Sulfate (mg/L)		150	152		130	98.1	158
TKN (mg/L)		.24	.26		.38	.55	.27
TOC (mg/L)			2.47		3.6	4.03	3.59
Total Phosphorus (mg/L)		.023	.027		.047	.033	.027
Total Suspended Solids (mg/L)		11	11		33	23	14
Zinc (ug/L)		< 10	< 10		19	< 10	< 10
CorrectedConductance(umhos/cm)		544	540		447	377	613
DissolvedOxygen(mg/L)		5.93	6.03		7.03	7.35	8.04
Flow(cfs)	78	57		444	183	186	
GageHeight(ft)	2.37	2.25		4.46	3.18	3.08	
pH(su)		7.82	7.29		7.77	7.59	7.51
Saturation(percent)		71.4	70.4		82.5	90.5	96.9

Sample Type: Inorganic	**09-14-2016**	**10-18-2016**	**12-13-2016**
Acidity (mg/L)	< 5	< 5	< 5
Alkalinity (mg/L)	92.1	88.6	70
Aluminum (ug/L)	235	< 200	< 200
Ammonia (mg/L)	< .05	.066	.058
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	99	105	45
BOD5 (mg/L)	< 2	< 2	
Bromide (ug/L)			
Cadmium (ug/L)	< .2	< .2	< .2
Calcium (mg/L)	58.8	88.5	64.3
Chloride (mg/L)	42.5	43.3	26.8
Chlorophyll_a (ug/L)			
Chromium (ug/L)	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20
Conductivity (umhos/cm)	670	939	650
Copper, Low Level (ug/L)	< 2	< 2	< 2
Hardness, Total (mg/L)	230	337	251
Iron (ug/L)	809	590	619
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	20.2	28.1	21.9
Manganese (ug/L)	703	566	216
Nickel (ug/L)	3.5	4.1	3.6
Nitrate, nitrite (mg/L)	.36	.31	.66
Nitrite (mg/L)	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01
Pheophytin_a (ug/L)			
Potassium (mg/L)	5.2	6.6	5.2
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	54.9	76.1	37.5
Solids, Total Dissolved (mg/L)	434	652	462
Strontium (ug/L)	457	632	354
Sulfate (mg/L)	181	345	205
TKN (mg/L)	< .2	.31	.41
TOC (mg/L)	3.59	2.44	
Total Phosphorus (mg/L)	.012	< .01	.037
Total Suspended Solids (mg/L)	13	5	< 5
Zinc (ug/L)	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	705	1039	664
DissolvedOxygen(mg/L)	5.86	7.81	16.64
Flow(cfs)	38	25	140
GageHeight(ft)	1.95	2	2.8
pH(su)	8	7.96	8.18
Saturation(percent)	67.3	81.7	127.9

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-07-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**
Temperature(deg C)	.94	8.82	1.42	6.34	12.82	17.8	18.83
UncorrectedConductance(umhos/cm)	239	191	179	187	172		285

Sample Type: Inorganic	**06-13-2016**	**06-21-2016**	**06-22-2016**	**06-27-2016**	**07-07-2016**	**08-03-2016**	**09-01-2016**
Temperature(deg C)		24.67	23		23.32	25.95	24.73
UncorrectedConductance(umhos/cm)		541			432	383	609

Sample Type: Inorganic	**09-14-2016**	**10-18-2016**	**12-13-2016**
Temperature(deg C)	22.12	17.38	4.19
UncorrectedConductance(umhos/cm)	666	887	400

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**80.6**	Location:	RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50
Basin:	Southeast Ohio River Tribs	Drainage:	200.0 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-07-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	26.6	20.1	18.2	18.6	17.3	24.1	26.4
Aluminum (ug/L)	< 200	375	1360	216	973	< 200	205
Ammonia (mg/L)	.069	< .05	.075	.054	< .05	< .05	.055
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	35	30	36	31	36	33	32
Bromide (ug/L)	39.7	< 20	23.3	< 20	< 40	23.5	
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	31	21.5	17.1	21.5	17.1	25.4	23.8
Chloride (mg/L)	36.5	11.4	20.5	11.8	8.5	9.5	8.7
Chlorophyll_a (ug/L)							
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	387	245	224	235	195	268	255
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	133	92	72	92	73	108	105
Iron (ug/L)	469	688	3210	535	1360	576	599
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	13.5	9.3	7.1	9.3	7.4	10.9	11.1
Manganese (ug/L)	1230	637	617	729	485	707	654
Nickel (ug/L)	11.5	8.3	7.2	8.7	7.6	6.7	5.9
Nitrate, nitrite (mg/L)	.2	.4	.38	.21	.17	.11	.1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)							
Potassium (mg/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	21.5	8.7	10.9	8.3	7	8.7	8.7
Solids, Total Dissolved (mg/L)	248	160	164	152	134	174	184
Strontium (ug/L)	112	85	65	83	73	104	103
Sulfate (mg/L)	112	72.6	54.4	75.7	58.4	84.4	84.1
TKN (mg/L)	< .2	.24	< .2	< .2	< .2	.21	< .2
Total Phosphorus (mg/L)	< .01	.015	.05	.01	< .01	.012	.013
Total Suspended Solids (mg/L)	< 5	9	71	< 5	18	< 5	< 5
Zinc (ug/L)	21	14	20	18	15	< 10	< 10
CorrectedConductance(umhos/cm)	482	254	243	232	211	276.4	270
DissolvedOxygen(mg/L)	12.74	13.93	21.36	16.18	9.88	7.86	8.15
Flow(cfs)	61	290	939	256	538		111
GageHeight(ft)	3.45	5.92	9.94	5.34	7.51		4.01
pH(su)	8.26	7.67	8.14	7.22	7.54	7.08	7.79
Saturation(percent)	87.7	120	154.2	133.1	91.3	81.3	86.1
Temperature(deg C)	.17	8.8	1.92	6.91	11.82	16.9	17.95
UncorrectedConductance(umhos/cm)	254	175	136	152	158		234

Sample Type: Inorganic	06-13-2016	06-22-2016	06-27-2016	07-07-2016	08-03-2016	09-01-2016	09-02-2015
Acidity (mg/L)		< 5		< 5	< 5	5	2.4
Alkalinity (mg/L)		36.2		32.3	40.2	44.8	47.7
Aluminum (ug/L)		< 200		< 200	< 200	< 200	< 200
Ammonia (mg/L)		.09		.063	.066	.087	.045
Arsenic (ug/L)		< 2		< 2	< 2	< 2	.3
Barium (ug/L)		41		32	37	42	36
Bromide (ug/L)		49.8		29.2			
Cadmium (ug/L)		< .2		< .2	< .2	< .2	.02
Calcium (mg/L)		36.1		29.7	32.5	39.5	31.3
Chloride (mg/L)		15.4		11.3	13.4	13.4	15.5
Chlorophyll_a (ug/L)		2.9					
Chromium (ug/L)		< 2		< 2	< 2	< 4	.1
COD, Chemical Oxygen Demand (mg/L)		< 20		< 20	< 20	< 20	9
Conductivity (umhos/cm)		384		283	352	403	339
Copper, Low Level (ug/L)		< 2		< 2	< 2	< 4	.5
Hardness, Total (mg/L)		154		121	137	171	126
Iron (ug/L)		812		748	806	517	644
Lead (ug/L)		< 2		< 2	< 2	< 2	.2
Magnesium (mg/L)		15.6		11.3	13.6	17.5	11.6
Manganese (ug/L)		839		386	422	648	534
Nickel (ug/L)		3		2.8	2.2	< 4	2.3
Nitrate, nitrite (mg/L)		.14		.17	.24	.14	.1
Nitrite (mg/L)		< .02		< .02	< .02	< .02	.011
Orthophosphate, dissolved (mg/L)		< .01		< .01	< .01	< .01	
Pheophytin_a (ug/L)		< 1.4					
Potassium (mg/L)		2.4		2.4	2.6	3.4	2.4
Selenium (ug/L)		< 2		< 2	< 2	< 2	.3
Sodium (mg/L)		12.5		10.8	11.7	12.1	12.2
Solids, Total Dissolved (mg/L)		250		192	222	290	226
Strontium (ug/L)		154		124	138	164	140
Sulfate (mg/L)		120		88.2	99.1	127	91.3
TKN (mg/L)		.29		< .2	.31	.28	.22
Total Phosphorus (mg/L)		.015		.012	.016	.024	.008
Total Suspended Solids (mg/L)		5		8	5	< 5	2
Zinc (ug/L)		< 10		< 10	< 10	< 10	4
CorrectedConductance(umhos/cm)		387.4		293	291	455	349
DissolvedOxygen(mg/L)		4		6.86	8.07	4.09	5.98
Flow(cfs)	17		57	41	27		6
GageHeight(ft)	2.66		3.26	3.13	2.76		2.36
pH(su)		7.18		8.16	7.92	7.2	8.12
Saturation(percent)		46.9		78.8	96.5	50	67.8
Temperature(deg C)		23.2		22.17	24.27	25.47	21.48
UncorrectedConductance(umhos/cm)				277	287	459	325

Sample Type: Inorganic	**09-14-2016**	**10-17-2016**	**12-13-2016**
Acidity (mg/L)	< 5	< 5	< 5
Alkalinity (mg/L)	54.2	52	30.2
Aluminum (ug/L)	< 200	< 200	< 200
Ammonia (mg/L)	.051	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	40	35	39
Bromide (ug/L)			
Cadmium (ug/L)	< .2	< .2	< .2
Calcium (mg/L)	37.8	38.4	55.5
Chloride (mg/L)	15.2	12.5	16
Chlorophyll_a (ug/L)			
Chromium (ug/L)	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20
Conductivity (umhos/cm)	377	357	565
Copper, Low Level (ug/L)	< 2	< 2	< 2
Hardness, Total (mg/L)	164	157	243
Iron (ug/L)	879	807	400
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	16.9	14.9	25.4
Manganese (ug/L)	864	387	193
Nickel (ug/L)	2.8	2.6	2.9
Nitrate, nitrite (mg/L)	.16	.1	.58
Nitrite (mg/L)	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01
Pheophytin_a (ug/L)			
Potassium (mg/L)	3.6	3.1	3.7
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	14.7	12.9	15.5
Solids, Total Dissolved (mg/L)	284	240	406
Strontium (ug/L)	169	159	209
Sulfate (mg/L)	108	116	217
TKN (mg/L)	< .2	.82	.26
Total Phosphorus (mg/L)	.01	.011	.012
Total Suspended Solids (mg/L)	5	< 5	< 5
Zinc (ug/L)	< 10	< 10	31
CorrectedConductance(umhos/cm)	394	399	582
DissolvedOxygen(mg/L)	5.22	6.63	16.2
Flow(cfs)	3	21	53
GageHeight(ft)	2.16	2.65	3.31
pH(su)	7.91	8.53	8.08
Saturation(percent)	58	67.2	121.1
Temperature(deg C)	20.43	15.92	3.17
UncorrectedConductance(umhos/cm)	360	330	339

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**11.0**	Location:	L. RACCOON CREEK @ JACKSON/GALLIA COUNTY LINE
Basin:	Southeast Ohio River Tribs	Drainage:	129.0 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	88.1	121	77	54.7	123
Aluminum (ug/L)	< 200	< 200	< 200	351	< 200
Ammonia (mg/L)	< .05	< .05	.068	.081	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	30	37	40	35	33
Bromide (ug/L)			34.3		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	60.6	83.3	71.3	43.3	74.7
Chloride (mg/L)	17.7	21.2	6.6	11.8	23.5
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	607	892	661	440	805
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	232	325	268	161	287
Iron (ug/L)	433	312	564	1350	304
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	19.6	28.4	21.8	12.8	24.4
Manganese (ug/L)	359	231	681	587	148
Nickel (ug/L)	4.6	3.5	6.6	6.8	3.9
Nitrate, nitrite (mg/L)	.56	.44	.51	.29	.64
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	4.7	6.2	5.1	3.4	7.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	36.1	55	38.3	20.1	59.5
Solids, Total Dissolved (mg/L)	430	600	438	262	550
Strontium (ug/L)	437	653	451	241	578
Sulfate (mg/L)	190	308	17	119	256
TKN (mg/L)	.44	< .2	.36	.51	.34
Total Phosphorus (mg/L)	.015	< .01	.013	.014	.02
Total Suspended Solids (mg/L)	< 5	< 5	< 5	9	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	593	885	643	438	786
DissolvedOxygen(mg/L)	7.46	6.84	7.29	7.72	6.68
pH(su)	7.8	8.18	7.69	8	7.79
Saturation(percent)	86.7	79.2	83.2	93.2	72.6
Temperature(deg C)	22.78	22.53	21.81	24.8	19.29
UncorrectedConductance(umhos/cm)	568	843	603	436	700

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**18.5**	Location:	L. RACCOON CREEK @ BUCKEYE FURNACE RD.
Basin:	Southeast Ohio River Tribs	Drainage:	87.0 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	69.7	139	85.5	60.2	137
Aluminum (ug/L)	< 200	< 200	258	< 200	< 200
Ammonia (mg/L)	.082	.057	.103	.089	.052
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	28	39	39	31	32
Bromide (ug/L)			34.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	41.7	81.6	78.3	48	76.8
Chloride (mg/L)	13.3	29.3	17.7	10.7	28.4
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	420	886	708	472	839
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	158	316	287	179	291
Iron (ug/L)	514	322	555	709	271
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	13.1	27.3	22.2	14.3	24.1
Manganese (ug/L)	421	297	1100	673	175
Nickel (ug/L)	4.8	4.8	12	7.2	5
Nitrate, nitrite (mg/L)	.39	.95	.81	.35	.57
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	3.5	7.4	6	3.6	8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	20.5	56.8	45.4	20.7	62.8
Solids, Total Dissolved (mg/L)	294	570	482	292	564
Strontium (ug/L)	279	653	472	260	571
Sulfate (mg/L)	111	267	239	163	259
TKN (mg/L)	.32	< .2	.25	.34	.36
Total Phosphorus (mg/L)	.018	< .01	.012	.014	< .01
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	11	< 10	11	< 10	< 10
CorrectedConductance(umhos/cm)	410	868	695	466	817
DissolvedOxygen(mg/L)	6.65	6.33	7	6.48	6.21
pH(su)	7.83	8.03	7.69	7.56	7.71
Saturation(percent)	77.8	72.7	80.2	78.2	68.6
Temperature(deg C)	23.16	22.13	22.03	24.81	20.05
UncorrectedConductance(umhos/cm)	396	820	655	464	740

River Code:	**09-574-000**	Stream:	**EAST BRANCH RACCOON CREEK**
River Mile:	**2.1**	Location:	E. BR. RACCOON CREEK ADJ. ST. RT. 56/328
Basin:	Southeast Ohio River Tribs	Drainage:	15.3 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	16.8	24	18.3	20.3	26.5
Aluminum (ug/L)	< 200	< 200	386	< 200	< 200
Ammonia (mg/L)	.054	.059	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	26	47	33	28	33
Bromide (ug/L)		40.3	38.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	83.6	122	115	112	111
Chloride (mg/L)	15.3	19.4	17.6	18	30
Chlorophyll_a (ug/L)		.9			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	731	935	920	972	943
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	348	502	472	459	460
Iron (ug/L)	338	589	727	272	385
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	33.8	48	44.8	43.5	44.5
Manganese (ug/L)	1160	1200	1160	533	761
Nickel (ug/L)	19.9	9.9	18.4	9.4	6.2
Nitrate, nitrite (mg/L)	.15	< .1	.2	.17	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		< 1.4			
Potassium (mg/L)	2.6	3.5	3.3	3.4	3.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	13.2	18.2	16.3	16.8	26.3
Solids, Total Dissolved (mg/L)	522	708	736	742	710
Strontium (ug/L)	232	334	307	300	321
Sulfate (mg/L)	333	448	445	446	428
TKN (mg/L)	< .2	< .2	< .2	.29	.2
Total Phosphorus (mg/L)	< .01	.017	.016	< .01	.417
Total Suspended Solids (mg/L)	< 5	19	17	< 5	< 5
Zinc (ug/L)	26	30	22	< 10	< 10
CorrectedConductance(umhos/cm)		933	972	959	888
DissolvedOxygen(mg/L)		5.83	7.64	7.66	7.42
pH(su)		6.77	6.88	7.02	7.3
Saturation(percent)		65.4	89.8	95	81.5
Temperature(deg C)		20.9	23.27	26.19	19.79
UncorrectedConductance(umhos/cm)			940	981	800

River Code:	**09-502-000**	Stream:	**BULLSKIN CREEK**
River Mile:	**0.4**	Location:	BULLSKIN CREEK AT THIVENOR @ ST. RT. 218
Basin:	Southeast Ohio River Tribs	Drainage:	14.4 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	108	101	109	116	142
Aluminum (ug/L)	< 200	565	< 200	< 200	< 200
Ammonia (mg/L)	< .05	.051	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	53	54	42	46	41
Bromide (ug/L)		29.3	24.6		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	98.2	76.1	76.1	79.7	80.3
Chloride (mg/L)	9.6	12.8	7.6	10.7	24.1
Chlorophyll_a (ug/L)		4.2			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	688	585	547	593	609
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	342	262	265	273	276
Iron (ug/L)	158	893	300	160	170
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	23.4	17.5	18.2	17.9	18.3
Manganese (ug/L)	182	119	80	94	311
Nickel (ug/L)	2.3	3	2.5	2.3	2.5
Nitrate, nitrite (mg/L)	.2	.4	.21	.18	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		1.5			
Potassium (mg/L)	2.8	3.5	2.9	3.1	3.1
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	16.1	13.3	13.3	14.1	20.7
Solids, Total Dissolved (mg/L)	458	424	376	430	404
Strontium (ug/L)	439	332	340	341	352
Sulfate (mg/L)	238	170	182	166	149
TKN (mg/L)	.26	.32	.28	.21	< .2
Total Phosphorus (mg/L)	.017	.049	.019	.022	.014
Total Suspended Solids (mg/L)	< 5	16	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	677	582	559	593	638
DissolvedOxygen(mg/L)	7.82	6.36	7.83	7.88	5.33
pH(su)	7.8	7.64	7.75	8.07	7.46
Saturation(percent)	90.2	72.3	93.7	94.6	63.9
Temperature(deg C)	22.38	21.7	24.29	24.51	24.42
UncorrectedConductance(umhos/cm)	643		552	588	631

River Code:	**09-503-000**	Stream:	**LITTLE BULLSKIN CREEK**
River Mile:	**0.0**	Location:	L. BULLSKIN CREEK SW OF THIVENOR @ MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	4.9 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	95.1	103	105	114	155
Aluminum (ug/L)	< 200	452	208	< 200	< 200
Ammonia (mg/L)	.058	.062	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	59	53	50	51	46
Bromide (ug/L)			20.9		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	78.4	77.2	60.9	63.8	74
Chloride (mg/L)	< 5	12.9	< 5	5	30.9
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	555	607	436	480	585
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	270	267	208	215	251
Iron (ug/L)	173	781	341	157	294
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	18.1	18.1	13.5	13.5	16
Manganese (ug/L)	255	116	127	130	78
Nickel (ug/L)	2.6	2.6	2.4	2.1	2.3
Nitrate, nitrite (mg/L)	.26	.42	.25	.19	.83
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.5	3.7	2.5	2.6	2.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	13	13.7	10.1	10.9	23.5
Solids, Total Dissolved (mg/L)	362	400	382	336	376
Strontium (ug/L)	344	338	261	265	286
Sulfate (mg/L)	179	177	113	117	105
TKN (mg/L)	< .2	.31	.21	.22	< .2
Total Phosphorus (mg/L)	.014	.04	.022	.026	< .01
Total Suspended Solids (mg/L)	< 5	12	5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	539	588	449	480	606
DissolvedOxygen(mg/L)	7.61	6.38	7.97	8.04	5.15
pH(su)	7.69	7.39	7.72	7.78	7.2
Saturation(percent)	86.6	73.1	94.6	96.4	57.4
Temperature(deg C)	21.67	22.04	23.85	24.43	20.56
UncorrectedConductance(umhos/cm)	505	555	439	475	555

River Code:	**09-506-000**	Stream:	**CLEAR FORK**
River Mile:	**0.0**	Location:	CLEAR FORK NEAR NORTHUP @ INGALLS RD.
Basin:	Southeast Ohio River Tribs	Drainage:	7.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	50.3	168	151	63.6	179
Aluminum (ug/L)	< 200	< 200	247	439	< 200
Ammonia (mg/L)	< .05	.057	.05	.06	.09
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	38	99	75	37	119
Bromide (ug/L)			49.2		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	34.7	72.1	62.6	32.4	73.2
Chloride (mg/L)	14	34.3	28	12.2	39.7
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	365	641	527	324	633
Copper, Low Level (ug/L)	< 2	< 2	2.1	< 2	< 2
Hardness, Total (mg/L)	138	239	209	116	242
Iron (ug/L)	351	219	426	1010	347
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	12.5	14.3	12.9	8.6	14.5
Manganese (ug/L)	209	272	93	119	1050
Nickel (ug/L)	< 2	< 2	2.1	3.1	2.5
Nitrate, nitrite (mg/L)	.19	.24	.93	.36	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.4	3.8	3.8	3.4	4.6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	18	34.5	30	13.8	39
Solids, Total Dissolved (mg/L)	230	370	342	222	394
Strontium (ug/L)	196	316	281	153	318
Sulfate (mg/L)	101	113	87.9	69.7	105
TKN (mg/L)	< .2	.2	.43	.54	.36
Total Phosphorus (mg/L)	.018	.017	.048	.038	.013
Total Suspended Solids (mg/L)	< 5	< 5	5	11	5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	374	642	536	324	663
DissolvedOxygen(mg/L)	9.57	7.4	5.85	6.75	3.81
pH(su)	7.66	7.35	7.51	7.89	7.04
Saturation(percent)	112.1	85.4	69.8	81.9	43
Temperature(deg C)	23.17	22.42	24.2	25.09	21.16
UncorrectedConductance(umhos/cm)	361	611	528	324	614

River Code:	**09-534-000**	Stream:	**PUNCHEON FORK**
River Mile:	**2.8**	Location:	PUNCHEON FORK UPST. MCARTHUR @ TWP. RD. 20
Basin:	Southeast Ohio River Tribs	Drainage:	4.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	46.8	61.9	71	64.4	85.3
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.053	.072	< .05	.057	.064
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	40	48	47	48	50
Bromide (ug/L)			32.2		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	30.3	35.3	43	41	46.6
Chloride (mg/L)	17.3	19	28.6	18	21.7
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	302	341	407	414	386
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	111	129	153	147	162
Iron (ug/L)	180	313	248	336	539
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	8.6	9.8	11	10.8	11.1
Manganese (ug/L)	172	555	187	476	526
Nickel (ug/L)	3.4	2.6	3.4	5	3.4
Nitrate, nitrite (mg/L)	.13	.12	.24	.14	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2	2.4	2.9	2.9	3.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	11.7	13.3	19.4	14.2	17.1
Solids, Total Dissolved (mg/L)	140	212	290	258	238
Strontium (ug/L)	124	139	168	154	169
Sulfate (mg/L)	70.8	75.6	88.5	95.3	76.2
TKN (mg/L)	< .2	.23	< .2	.25	.26
Total Phosphorus (mg/L)	.015	.012	.014	< .01	.03
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	11
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	294	344	437	407	365
DissolvedOxygen(mg/L)	8.52	5.59	8.57	6.86	6.28
pH(su)	7.7	7.31	7.68	6.5	7.76
Saturation(percent)	94.7	61	99.6	84.5	67.5
Temperature(deg C)	20.52	19.52	22.78	25.87	18.81
UncorrectedConductance(umhos/cm)	268	308	419	414	322

River Code:	**09-563-000**	Stream:	**HEWETT FORK**
River Mile:	**13.1**	Location:	HEWETT FORK NE OF CARBONDALE, ADJ CARBONDALE RD.
Basin:	Southeast Ohio River Tribs	Drainage:	8.3 sq mi

Sample Type: Inorganic	**05-25-2016**	**06-22-2016**	**07-05-2016**	**07-27-2016**	**08-29-2016**	**09-21-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	20.7	8.5	15.5	12.8	29.2	13.9
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.066	.064	< .05	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	24	39	32	29	26	28
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	29.1	46.6	44.2	44.9	45.9	50.3
Chloride (mg/L)	< 5	< 5	< 5	< 5	5.1	6.1
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	126	< 20	< 20	< 20
Conductivity (umhos/cm)	272	439	367	439	390	460
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	115	184	172	176	173	192
Iron (ug/L)	272	230	507	342	670	226
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	10.2	16.4	14.9	15.5	14.3	16.1
Manganese (ug/L)	784	1620	911	716	510	306
Nickel (ug/L)	9.7	13.9	9.1	6.7	2.9	3.7
Nitrate, nitrite (mg/L)	< .1	.11	< .1	< .1	.11	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.8	2.7	2.8	2.9	3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	6.1	7.4	7.1	7.1	7.6	7.1
Solids, Total Dissolved (mg/L)	216	308	264	318	266	312
Strontium (ug/L)	132	248	223	242	228	261
Sulfate (mg/L)	100	181	148	168	150	194
TKN (mg/L)	< .2	< .2	.29	< .2	.56	< .2
Total Phosphorus (mg/L)	< .01	.011	.029	.011	.042	.017
Total Suspended Solids (mg/L)	< 5	< 5	< 5	5	9	< 5
Zinc (ug/L)	16	19	161	10	< 10	< 10
CorrectedConductance(umhos/cm)	227	435	388	451	402	470
DissolvedOxygen(mg/L)	8.6	7.76	7.21	6.25	5.88	6.82
pH(su)	7.55	7.56	8.15	7.91	7.35	7.53
Saturation(percent)	92.5	86.7	80.1	73.9	71.1	74.2
Temperature(deg C)	18.86	20.77	20.46	23.69	24.88	19.44
UncorrectedConductance(umhos/cm)	201	400	354	440	401	421

River Code:	**09-571-000**	Stream:	**BRUSHY FORK**
River Mile:	**0.4**	Location:	BRUSHY CREEK @ SR 328 NEAR MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	33.4 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**	**06-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	
Alkalinity (mg/L)	18.6	15.2	10.5	13.5	14.7	17.1	
Aluminum (ug/L)	273	419	646	570	< 200	271	
Ammonia (mg/L)	.053	.057	.056	< .05	< .05	.07	
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Barium (ug/L)	36	34	31	34	38	34	
Bromide (ug/L)	24.7	< 20	27	< 40	< 20		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	
Calcium (mg/L)	18.4	14.8	13.3	11	16.9	14.6	
Chloride (mg/L)	15	12.3	24.3	8.7	9.9	9.2	
Chlorophyll_a (ug/L)							
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20	
Conductivity (umhos/cm)	238	199	220	155	216	195	
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Hardness, Total (mg/L)	85	69	62	52	80	72	
Iron (ug/L)	1310	764	919	882	551	572	
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Magnesium (mg/L)	9.5	7.7	6.9	6	9.1	8.6	
Manganese (ug/L)	1360	911	780	609	1300	1010	
Nickel (ug/L)	13.7	11.8	10	9.4	15.1	11.5	
Nitrate, nitrite (mg/L)	.23	.51	.31	.28	.13	.14	
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	
Orthophosphate, dissolved (mg/L)	< .01	.011	< .01	< .01	< .01	< .01	
Pheophytin_a (ug/L)							
Potassium (mg/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Sodium (mg/L)	9.2	8.7	12	6.3	8	8.1	
Solids, Total Dissolved (mg/L)	156	132	140	102	136	136	
Strontium (ug/L)	70	61	50	48	69	67	
Sulfate (mg/L)	71.4	52.4	50.6	42.3	64.6	58.9	
TKN (mg/L)	< .2	.3	< .2	< .2	< .2	< .2	
Total Phosphorus (mg/L)	< .01	.015	.012	< .01	< .01	< .01	
Total Suspended Solids (mg/L)	< 5	8	21	11	< 5	< 5	
Zinc (ug/L)	27	22	23	20	20	21	
CorrectedConductance(umhos/cm)	248	207	219	160	220.3	204	
DissolvedOxygen(mg/L)	17.02	13.2	17.52	12.24	8.12	8.62	
GageHeight(ft)	14.77	13.65	12.14	12.98		14.62	15.42
pH(su)	7.11	7.08	7.72	7.46	6.83	6.9	
Saturation(percent)	122.3	114.8	125.1	109.1	83.6	91.5	
Temperature(deg C)	1.74	9.17	1.53	10.26	16.7	18.18	
UncorrectedConductance(umhos/cm)	138	145	121	115		177	

Sample Type: Inorganic	06-22-2016	06-27-2016	07-06-2016	08-03-2016	09-14-2016	10-17-2016	12-13-2016
Acidity (mg/L)	< 5		< 5	< 5	< 5	< 5	5.7
Alkalinity (mg/L)	16.4		18.3	33.1	46.8	45.9	< 5
Aluminum (ug/L)	< 200		454	214	338	< 200	403
Ammonia (mg/L)	.173		.081	.147	.121	.132	.133
Arsenic (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	68		47	38	54	39	44
Bromide (ug/L)	35.2		23.2				
Cadmium (ug/L)	< .2		< .2	< .2	< .2	< .2	.3
Calcium (mg/L)	31.4		36.3	31.8	39	40	50.2
Chloride (mg/L)	14		11	15.3	14.3	28.6	22.5
Chlorophyll_a (ug/L)	1.5						
Chromium (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20		< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	384		385	393	427	477	614
Copper, Low Level (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	149		166	149	195	193	252
Iron (ug/L)	943		1060	1150	4310	1000	256
Lead (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	17.2		18.3	16.8	23.6	22.6	30.7
Manganese (ug/L)	3430		2520	1590	3080	844	7090
Nickel (ug/L)	21.7		19.4	12.8	13.8	8.2	38.1
Nitrate, nitrite (mg/L)	.17		.27	.42	< .1	.14	.31
Nitrite (mg/L)	< .02		< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01		< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)	< 1.4						
Potassium (mg/L)	2.9		4.1	4.1	5.2	6.3	5.2
Selenium (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	11.1		9.8	12.4	13.3	17.6	17
Solids, Total Dissolved (mg/L)	256		280	274	320	322	434
Strontium (ug/L)	117		113	114	141	138	153
Sulfate (mg/L)	135		136	122	139	157	257
TKN (mg/L)	< .2		.27	.33	.24	.65	< .2
Total Phosphorus (mg/L)	.018		.019	.013	< .01	.01	< .01
Total Suspended Solids (mg/L)	9		9	< 5	< 5	< 5	< 5
Zinc (ug/L)	63		22	11	13	< 10	84
CorrectedConductance(umhos/cm)	384.3		409	398	484	490	627
DissolvedOxygen(mg/L)	5.3		7.02	5.53	5.28	6.08	15.56
GageHeight(ft)		15.29	15.25	15.58	15.66	15.62	14.97
pH(su)	6.67		7.46	7.31	7.06	7.56	8.62
Saturation(percent)	59.1		79.1	68.5	61	62	113.6
Temperature(deg C)	20.7		21.16	26.25	22.51	16.28	2.3
UncorrectedConductance(umhos/cm)			379	408	461	409	355

River Code:	**09-571-000**	Stream:	**BRUSHY FORK**
River Mile:	**6.9**	Location:	BRUSHY CREEK 2.7 MI. N OF CREOLA @ GRAVEL LANE OFF S.R. 93
Basin:	Southeast Ohio River Tribs	Drainage:	8.4 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	18.6	27.2	27	42	81.5
Aluminum (ug/L)	< 200	< 200	< 200	< 200	1310
Ammonia (mg/L)	< .05	.077	< .05	.073	.05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	35	43	34	22	43
Bromide (ug/L)			28		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	14.4	20.7	20.5	18.3	27.9
Chloride (mg/L)	18.9	29.8	27.2	29.7	71.4
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	36
Conductivity (umhos/cm)	218	296	269	273	389
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	2.2
Hardness, Total (mg/L)	65	90	87	76	115
Iron (ug/L)	195	456	280	402	2510
Lead (ug/L)	< 2	< 2	< 2	< 2	2.4
Magnesium (mg/L)	7.1	9.2	8.8	7.4	11
Manganese (ug/L)	843	1150	397	636	1690
Nickel (ug/L)	9.1	4.2	2.8	< 2	7.4
Nitrate, nitrite (mg/L)	< .1	.11	.11	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.3	2.1	2.2	4.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	11.3	17.1	15.3	15.6	40.5
Solids, Total Dissolved (mg/L)	130	184	188	152	234
Strontium (ug/L)	65	88	82	74	111
Sulfate (mg/L)	50.3	65.1	58.1	37.7	10.4
TKN (mg/L)	< .2	< .2	< .2	.27	.66
Total Phosphorus (mg/L)	.038	.01	.011	.01	.093
Total Suspended Solids (mg/L)	< 5	7	< 5	< 5	171
Zinc (ug/L)	< 10	< 10	< 10	< 10	31
CorrectedConductance(umhos/cm)	209	295	286	268	371
DissolvedOxygen(mg/L)	8.48	6.23	7.71	4.79	5.98
pH(su)	7.54	7.12	7.67	6.56	7.53
Saturation(percent)	97.9	66	91	58.6	60.8
Temperature(deg C)	22.49	18.09	23.67	25.52	16.15
UncorrectedConductance(umhos/cm)	199	256	279	271	308

River Code:	**09-571-002**	Stream:	**SIVERLY CREEK**
River Mile:	**0.3**	Location:	SIVERLY CREEK N OF CREOLA @ LANE NEAR MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	10.1 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	30.4	46	43.4	52.2	87.2
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.06	.093	< .05	.074	.094
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	30	36	30	33	41
Bromide (ug/L)			< 20		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	9.1	11.7	11.9	13	20.3
Chloride (mg/L)	8.6	11.9	11.2	12.1	10.7
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	133		150	172	192
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	42	51	51	54	79
Iron (ug/L)	512	1320	731	1480	1090
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	4.7	5.3	5.1	5.1	6.9
Manganese (ug/L)	97	368	112	351	906
Nickel (ug/L)	< 2	< 2	< 2	< 2	< 2
Nitrate, nitrite (mg/L)	< .1	.12	.17	.1	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	< 2	< 2	< 2	4
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	6.8	8.3	8.2	8.2	9.3
Solids, Total Dissolved (mg/L)	72	96	96	92	80
Strontium (ug/L)	47	59	55	58	87
Sulfate (mg/L)	18.7	14.3	14.8	10.7	< 5
TKN (mg/L)	< .2	< .2	< .2	.27	.45
Total Phosphorus (mg/L)	.019	.012	.018	.024	.868
Total Suspended Solids (mg/L)	< 5	5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	128	157	160	172	185
DissolvedOxygen(mg/L)	8.37	5.16	7.67	4.98	4.26
pH(su)	7.73	7.23	7.88	6.61	7.9
Saturation(percent)	92.9	55.3	88.9	61	43.4
Temperature(deg C)	20.43	18.69	22.65	25.65	16.3
UncorrectedConductance(umhos/cm)	117	138	153	174	154

River Code:	**09-553-000**	Stream:	**PIERCE RUN**
River Mile:	**5.5**	Location:	PIERCE RUN W OF ORETON, DST. GOB PILE 82001305
Basin:	Southeast Ohio River Tribs	Drainage:	3.4 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	7.9	< 5	< 5
Alkalinity (mg/L)	31.4	65.1	88.4	71.6	67.2
Aluminum (ug/L)	< 200	430	386	322	491
Ammonia (mg/L)	< .05	.686	.497	.699	.962
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	36	20	24	21	18
Bromide (ug/L)			47.2		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	25	257	265	358	315
Chloride (mg/L)	< 5	14.9	14.2	15.3	11.5
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	225	2150	1880	2180	2630
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	94	1050	1060	1430	1290
Iron (ug/L)	153	9390	5070	6470	10900
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	7.6	99	96.8	130	123
Manganese (ug/L)	148	2090	2060	2000	2070
Nickel (ug/L)	3.1	33.4	32	31.9	31.8
Nitrate, nitrite (mg/L)	.12	.27	.28	.3	.35
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	12.3	12.3	13.7	16.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	< 5	116	112	134	179
Solids, Total Dissolved (mg/L)	182	1810	1670	1940	2520
Strontium (ug/L)	102	1690	1730	1870	2290
Sulfate (mg/L)	68.4	1270	1070	1360	1610
TKN (mg/L)	< .2	.79	.88	.84	1.18
Total Phosphorus (mg/L)	.019	< .01	< .01	< .01	.013
Total Suspended Solids (mg/L)	< 5	24	7	9	19
Zinc (ug/L)	< 10	23	17	18	25
CorrectedConductance(umhos/cm)	223	2102	1846	2221	2622
DissolvedOxygen(mg/L)	8.87	7.57	6.36	6.88	6.56
pH(su)	7.99	7.42	7.33	7.39	7.07
Saturation(percent)	95.3	83.6	77.4	85.9	76.9
Temperature(deg C)	18.76	19.9	24.96	26.36	22.9
UncorrectedConductance(umhos/cm)	197	1897	1845	2279	2516

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**1.2**	Location:	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325
Basin:	Southeast Ohio River Tribs	Drainage:	154.0 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	79.5	126	84.3	76.7	138
Aluminum (ug/L)	< 200	< 200	217	< 200	< 200
Ammonia (mg/L)	.057	.065	< .05	.128	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	32	40	37	52	40
Bromide (ug/L)		41.4	34.1		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	54.9	71.2	59.1	24.3	75.9
Chloride (mg/L)	13.3	17	12.5	8.3	21
Chlorophyll_a (ug/L)		.8			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	573	755	582	219	818
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	209	277	228	86	290
Iron (ug/L)	457	465	790	823	332
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	17.5	24.2	19.5	6.2	24.5
Manganese (ug/L)	240	294	251	373	208
Nickel (ug/L)	3.5	3.9	3.7	< 2	3.8
Nitrate, nitrite (mg/L)	.38	.34	.53	.46	.28
Nitrite (mg/L)	< .02	< .02	< .02	.042	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		< 1.4			
Potassium (mg/L)	3.8	5.4	4.7	3.7	6.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	32.1	53.8	33.7	7	64.6
Solids, Total Dissolved (mg/L)	376	550	394	152	568
Strontium (ug/L)	389	590	416	95	608
Sulfate (mg/L)	186	248	208	18.7	266
TKN (mg/L)	.2	.2	.26	.66	.32
Total Phosphorus (mg/L)	.014	.013	.025	.017	< .01
Total Suspended Solids (mg/L)	< 5	< 5	11	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	574	773	603	217	854
DissolvedOxygen(mg/L)	6.71	6.15	6.42	6.69	5.3
pH(su)	7.49	7.56	7.81	7.67	7.57
Saturation(percent)	77	71	73.8	78.1	58.8
Temperature(deg C)	22.12	22.4	22.17	23.04	20.36
UncorrectedConductance(umhos/cm)	542		570	209	778

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**40.0**	Location:	RACCOON CREEK AT VINTON @ ST. RT. 160
Basin:	Southeast Ohio River Tribs	Drainage:	381.0 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**	**06-22-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	39.1	25.3	25.6	24.3	38.4	33.2	49.9
Aluminum (ug/L)	< 200	519	2110	1900	1940	299	< 200
Ammonia (mg/L)	.078	.07	.071	< .05	< .05	< .05	.069
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	34	33	42	38	48	31	44
Bromide (ug/L)	30.3	< 20	24.4	< 40	< 20		46.8
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	36.8	23.4	20.7	18	24.6	27.6	42.2
Chloride (mg/L)	16.2	12.7	24.7	8.9	8	10.1	16
Chlorophyll_a (ug/L)							3.6
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	369	257	258	200	237	293	482
Copper, Low Level (ug/L)	< 2	< 2	3	< 2	2.1	< 2	< 2
Hardness, Total (mg/L)	149	96	82	73	96	117	173
Iron (ug/L)	469	1160	4910	2960	3220	896	795
Lead (ug/L)	< 2	< 2	2.6	< 2	< 2	< 2	< 2
Magnesium (mg/L)	13.8	9.2	7.3	6.9	8.4	11.7	16.5
Manganese (ug/L)	856	520	482	306	395	353	601
Nickel (ug/L)	7.4	6.1	7.4	6.4	4.6	3.6	2.8
Nitrate, nitrite (mg/L)	.21	.45	.36	.21	.26	.15	.12
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01		< .01
Pheophytin_a (ug/L)							< 1.4
Potassium (mg/L)	2.1	2.1	< 2	< 2	2.3	2	2.7
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	15	10.2	14	7.7	9.5	11.5	25
Solids, Total Dissolved (mg/L)	248	180	174	134	160	198	366
Strontium (ug/L)	156	100	88	80	113	132	233
Sulfate (mg/L)	124	74.7	59.5	55.2	63.4	88.4	161
TKN (mg/L)	.29	.44	.36	.22	.65	< .2	.26
Total Phosphorus (mg/L)	< .01	.05	.089	.05	.086	.019	.023
Total Suspended Solids (mg/L)	< 5	39	147	64	72	14	10
Zinc (ug/L)	< 10	14	25	16	22	12	< 10
CorrectedConductance(umhos/cm)	384	272	256	203	240.9	276	496.8
DissolvedOxygen(mg/L)	18.61	14.14	19.07	10.09	8.62	16.16	6.43
pH(su)	7.66	7.33	7.8	7.42	7.2	7.82	7.15
Saturation(percent)	131.2	121.8	135.2	94.8	88.4	173.9	76.6
Temperature(deg C)	1.03	8.81	1.27	12.56	16.5	18.88	24.1
UncorrectedConductance(umhos/cm)	208	188	140	154		243	

Sample Type: Inorganic	07-07-2016	08-03-2016	09-14-2016	10-17-2016	12-13-2016
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	50.8	63.1	70.5	61.4	57.5
Aluminum (ug/L)	530	439	< 200	< 200	< 200
Ammonia (mg/L)	.066	.07	< .05	.06	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	47	41	55	62	35
Bromide (ug/L)	30.4				
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	36.8	37.6	52.2	67.5	60.5
Chloride (mg/L)	12.6	14.6	14.6	17.2	31
Chlorophyll_a (ug/L)					
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	23
Conductivity (umhos/cm)	364	380	521	617	635
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	146	149	212	273	245
Iron (ug/L)	1420	1510	414	677	679
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	13.2	13.4	19.8	25.4	22.7
Manganese (ug/L)	412	416	1060	844	194
Nickel (ug/L)	3.2	3	3.1	3.7	3
Nitrate, nitrite (mg/L)	.34	.38	.15	.13	.33
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)					
Potassium (mg/L)	3.3	3.4	4.2	4.9	4.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	18.3	15.4	27.2	41.1	33.6
Solids, Total Dissolved (mg/L)	250	248	344	416	442
Strontium (ug/L)	182	174	287	391	310
Sulfate (mg/L)	112	90.8	159	234	213
TKN (mg/L)	.24	.49	< .2	.41	.29
Total Phosphorus (mg/L)	.037	.036	< .01	.01	.019
Total Suspended Solids (mg/L)	24	20	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	376	372	547	609	644
DissolvedOxygen(mg/L)	7.56	7.8	5.83	8.2	15.24
pH(su)	7.93	7.54	7.69	7.48	8.08
Saturation(percent)	88.3	95.7	66.8	87.1	115.9
Temperature(deg C)	23.09	25.7	21.98	18.16	3.8
UncorrectedConductance(umhos/cm)	363	377	516	530	383

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**72.2**	Location:	RACCOON CREEK AT VALES MILLS @ ST. RT. 346
Basin:	Southeast Ohio River Tribs	Drainage:	223.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	28.2	42.9	42.5	48.4	53.7
Aluminum (ug/L)	< 200	< 200	227	< 200	< 200
Ammonia (mg/L)	.051	.076	.065	.075	.063
Arsenic (ug/L)	< 4	< 2	< 2	< 2	< 2
Barium (ug/L)	27	37	39	36	44
Bromide (ug/L)			36.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	22.4	30.3	33	29.4	36.5
Chloride (mg/L)	9.1	16.2	12	12.7	13.3
Chromium (ug/L)	< 4	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	257	353	326	309	363
Copper, Low Level (ug/L)	< 4	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	96	130	140	117	158
Iron (ug/L)	590	713	859	818	579
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	9.8	13.3	13.9	10.7	16.3
Manganese (ug/L)	504	559	487	430	1060
Nickel (ug/L)	4.1	2.6	2.7	2.1	2.5
Nitrate, nitrite (mg/L)	.11	.12	.21	.25	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.2	2.6	2.5	3.5
Selenium (ug/L)	< 4	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.2	12.3	11.1	11.2	13.5
Solids, Total Dissolved (mg/L)	192	226	216	204	270
Strontium (ug/L)	95	133	136	125	168
Sulfate (mg/L)	75.9	96.3	99.3	75.3	103
TKN (mg/L)	< .2	.22	.25	.27	< .2
Total Phosphorus (mg/L)	.016	.018	.016	.019	< .01
Total Suspended Solids (mg/L)	8	6	11	6	< 5
Zinc (ug/L)	< 10	12	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	269	347	338	300	385
DissolvedOxygen(mg/L)	7.73	5.57	6.45	5.44	5.53
pH(su)	7.8	8.26	8.27	7.34	8.61
Saturation(percent)	81.7	64.7	74	66	60.8
Temperature(deg C)	17.96	22.83	22.12	25.08	19.9
UncorrectedConductance(umhos/cm)	233	332	319	301	347

River Code:	**09-563-000**	Stream:	**HEWETT FORK**
River Mile:	**4.3**	Location:	HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20
Basin:	Southeast Ohio River Tribs	Drainage:	28.1 sq mi

Sample Type: Inorganic	**05-25-2016**	**06-22-2016**	**07-05-2016**	**07-27-2016**	**08-29-2016**	**09-21-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	39.4	24	53.1	45.5	48.5	48
Aluminum (ug/L)	254	< 200	426	< 200	< 200	< 200
Ammonia (mg/L)	.083	.084	.063	.054	.059	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	28	52	28	41	45	62
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	32	69.5	39.5	64.4	78.6	104
Chloride (mg/L)	6.4	8.5	7.7	9.3	10.5	10.7
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	287	570	335	528	570	792
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	117	238	139	211	259	335
Iron (ug/L)	965	375	1210	441	674	565
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	8.9	15.7	9.9	12.1	15.3	18.4
Manganese (ug/L)	389	594	373	251	302	413
Nickel (ug/L)	4	5.3	3.6	2.8	3.1	4.2
Nitrate, nitrite (mg/L)	< .1	.22	.17	.23	.21	.14
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.8	2.5	2.8	3.3	3.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	9.5	17.2	11.9	15.9	19	22.3
Solids, Total Dissolved (mg/L)	222	392	220	352	400	600
Strontium (ug/L)	141	313	163	272	322	434
Sulfate (mg/L)	85	227	95.5	182	216	340
TKN (mg/L)	< .2	< .2	.44	.3	.31	.22
Total Phosphorus (mg/L)	.011	.011	.03	.014	< .05	.01
Total Suspended Solids (mg/L)	7	< 5	14	< 5	9	< 5
Zinc (ug/L)	10	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	237	555	345	539	575	803
DissolvedOxygen(mg/L)	8.17	7.65	7.89	5.95	7.05	7.02
pH(su)	7.32	7.44	7.84	7.35	7.41	7.56
Saturation(percent)	86.8	86.7	88.1	71.3	83.7	75.9
Temperature(deg C)	18.29	21.49	20.7	24.38	23.89	19.03
UncorrectedConductance(umhos/cm)	207	518	317	533	563	711

River Code:	**09-525-000**	Stream:	**SAND RUN**
River Mile:	**0.3**	Location:	SAND RUN NEAR WELLSTON @ ST. RT. 349
Basin:	Southeast Ohio River Tribs	Drainage:	9.2 sq mi

Sample Type: Inorganic	**04-12-2016**	**04-27-2016**	**05-11-2016**	**06-07-2016**	**06-23-2016**
Ammonia (mg/L)	< .05	< .05	.085	.109	.232
Nitrate, nitrite (mg/L)	.64	.23	.14	.51	.41
Orthophosphate, dissolved (mg/L)	< .01	.013	.013	.021	.011
Total Phosphorus (mg/L)	.01	.063	.048	.071	.121
CorrectedConductance(umhos/cm)	255	223	190	275	332
DissolvedOxygen(mg/L)	13.27	7.11	8.62	3.87	5.15
pH(su)	7.41	7.72	7.81	7.79	7.71
Saturation(percent)	116.7	72.3	87.3	43.9	57.2
Temperature(deg C)	9.65	16.14	15.97	21.55	20.42
UncorrectedConductance(umhos/cm)	180	185	157	257	303

River Code:	**09-540-000**	Stream:	**LITTLE INDIAN CREEK**
River Mile:	**0.2**	Location:	L. INDIAN CREEK N OF RIO GRANDE @ ST. RT. 325
Basin:	Southeast Ohio River Tribs	Drainage:	10.2 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	57.3	92.1	60	64.6	114
Aluminum (ug/L)	< 200	< 200	256	< 200	< 200
Ammonia (mg/L)	.191	.378	.072	.08	.556
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	45	62	40	38	77
Bromide (ug/L)			25.2		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	16.7	21.6	18.7	18	39.5
Chloride (mg/L)	6.6	12	8.6	5.3	40.7
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	20	< 20	< 20	< 20
Conductivity (umhos/cm)	179	250	185	181	401
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	64	81	70	66	135
Iron (ug/L)	731	907	929	721	612
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	5.3	6.5	5.7	5.1	8.8
Manganese (ug/L)	462	1000	204	251	1500
Nickel (ug/L)	< 2	< 2	< 2	< 2	< 2
Nitrate, nitrite (mg/L)	.21	.18	.37	.17	.13
Nitrite (mg/L)	< .02	< .02	< .02	< .02	.057
Potassium (mg/L)	2.2	3.9	3.3	2.5	6.6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.9	15.3	7.6	7	25
Solids, Total Dissolved (mg/L)	106	120	132	132	250
Strontium (ug/L)	83	102	81	77	145
Sulfate (mg/L)	19.5	16.9	18.7	15.3	40.5
TKN (mg/L)	.28	.96	.27	.24	1.02
Total Phosphorus (mg/L)	.021	.041	.034	.025	.029
Total Suspended Solids (mg/L)	< 5	< 5	< 5	5	< 5
Zinc (ug/L)	< 10	< 10	24	< 10	< 10
CorrectedConductance(umhos/cm)	178	254	186	180	425
DissolvedOxygen(mg/L)	7.24	10.89	7.49	6.88	4.85
pH(su)	6.88	7.53	7.67	7.51	6.82
Saturation(percent)	80.9	120.5	85.5	80.4	52.1
Temperature(deg C)	20.78	20.27	21.86	23.12	18.8
UncorrectedConductance(umhos/cm)	163	231	175	173	375

River Code:	**09-511-000**	Stream:	**DEER CREEK**
River Mile:	**0.2**	Location:	DEER CREEK NEAR VINTON, NEAR MOUTH ADJ. ST. RT. 325
Basin:	Southeast Ohio River Tribs	Drainage:	5.9 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-02-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	58.7	117	65.9	49.1
Aluminum (ug/L)	< 200	< 200	259	382
Ammonia (mg/L)	.094	.065	< .05	.159
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	43	40	42	29
Bromide (ug/L)			23.9	
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	19.5	71.6	20.3	30.8
Chloride (mg/L)	9.1	16.5	8.3	9.7
Chromium (ug/L)	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	200	790	190	314
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	72	279	73	113
Iron (ug/L)	473	491	869	1210
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	5.7	24.4	5.5	8.7
Manganese (ug/L)	218	287	157	312
Nickel (ug/L)	< 2	2.7	< 2	4.6
Nitrate, nitrite (mg/L)	.27	.28	.33	.24
Nitrite (mg/L)	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.5	5.6	3	3
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	7.4	54.6	7.6	13.5
Solids, Total Dissolved (mg/L)	108	506	130	222
Strontium (ug/L)	87	599	83	156
Sulfate (mg/L)	20.7	251	18.9	79
TKN (mg/L)	.35	.2	.31	.36
Total Phosphorus (mg/L)	.024	.012	.028	.032
Total Suspended Solids (mg/L)	< 5	< 5	5	17
Zinc (ug/L)	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	191	814	198	323
DissolvedOxygen(mg/L)	7.63	7.6	7.06	6.15
pH(su)	7.26	7.97	7.93	8.09
Saturation(percent)	85.7	87.7	81.5	73.3
Temperature(deg C)	21.06	22.35	22.46	24.09
UncorrectedConductance(umhos/cm)	176	773	188	318

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**55.5**	Location:	RACCOON CREEK S OF CLARION @ ST. RT. 124
Basin:	Southeast Ohio River Tribs	Drainage:	322.0 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**	**06-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	
Alkalinity (mg/L)	35.3	25	26.9	23.8	33.1	32.1	
Aluminum (ug/L)	207	706	1920	1030	345	254	
Ammonia (mg/L)	.094	.055	.076	< .05	< .05	.055	
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Barium (ug/L)	35	34	42	34	32	29	
Bromide (ug/L)	30.3	< 20	27.4	< 40	22.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	
Calcium (mg/L)	39.3	25.5	22.6	19.7	34.9	28.5	
Chloride (mg/L)	22.3	12.5	29.5	8.8	11.6	10.3	
Chlorophyll_a (ug/L)							
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20	
Conductivity (umhos/cm)	416	275	279	214	353	308	
Copper, Low Level (ug/L)	< 2	< 2	2.5	< 2	< 2	< 2	
Hardness, Total (mg/L)	162	105	89	81	142	121	
Iron (ug/L)	879	1440	4330	2130	1050	840	
Lead (ug/L)	< 2	< 2	2.4	< 2	< 2	< 2	
Magnesium (mg/L)	15.4	10.1	7.8	7.6	13.2	12.1	
Manganese (ug/L)	1030	582	576	363	526	445	
Nickel (ug/L)	9.3	7.5	7.4	6.6	5.5	4.4	
Nitrate, nitrite (mg/L)	.2	.43	.39	.22	.17	.34	
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01		
Pheophytin_a (ug/L)							
Potassium (mg/L)	2.2	2.1	< 2	< 2	2.1	2	
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Sodium (mg/L)	24.8	11.1	15.6	8.1	15.8	12.3	
Solids, Total Dissolved (mg/L)	280	176	168	154	234	210	
Strontium (ug/L)	167	109	88	85	175	139	
Sulfate (mg/L)	130	81.8	61.6	61.8	110	102	
TKN (mg/L)	.42	.35	.4	< .2	.29	.33	
Total Phosphorus (mg/L)	< .01	.027	.085	.033	.02	.012	
Total Suspended Solids (mg/L)	< 5	18	126	43	8	8	
Zinc (ug/L)	37	11	20	11	66	18	
CorrectedConductance(umhos/cm)	425	286	280	217	364.3	303	
DissolvedOxygen(mg/L)	17.42	16.12	16.64	10.05	7.77	13.82	
GageHeight(ft)	17.69	15.26	11.57	12.91		17.47	19.1
pH(su)	7.37	6.58	7.51	7.51	7.04	7.77	
Saturation(percent)	120.5	138.5	117	93.8	80.3	149.9	
Temperature(deg C)	.35	8.68	.95	12.27	16.9	19.28	
UncorrectedConductance(umhos/cm)	225	197	151	165		270	

Sample Type: Inorganic	06-22-2016	06-27-2016	07-07-2016	08-03-2016	09-14-2016	10-17-2016	12-13-2016
Acidity (mg/L)	< 5		< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	48.9		51.7	55.6	70.2	76	58
Aluminum (ug/L)	< 200		259	286	< 200	< 200	< 200
Ammonia (mg/L)	.058		.056	.055	.052	.073	< .05
Arsenic (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	35		39	33	47	44	34
Bromide (ug/L)	46.9		38.1				
Cadmium (ug/L)	< .2		< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	43.8		44.7	36.5	68	81.9	75.5
Chloride (mg/L)	16.3		15.2	13.6	16	18.5	31
Chlorophyll_a (ug/L)	.9						
Chromium (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20		< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	506		440	382	722	854	764
Copper, Low Level (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	183		185	145	276	331	308
Iron (ug/L)	955		1000	1510	731	501	862
Lead (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	17.9		17.8	13.2	25.8	30.8	28.9
Manganese (ug/L)	507		438	374	818	624	395
Nickel (ug/L)	3.5		3.9	3.4	4	5.2	4.5
Nitrate, nitrite (mg/L)	.13		.26	.29	.17	.24	.29
Nitrite (mg/L)	< .02		< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01		< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)	< 1.4						
Potassium (mg/L)	2.7		3.2	3.2	4.9	5.3	4.4
Selenium (ug/L)	< 2		< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	24.5		18	17.3	52.8	61.9	40.8
Solids, Total Dissolved (mg/L)	332		288	234	506	620	540
Strontium (ug/L)	244		218	175	427	496	405
Sulfate (mg/L)	166		138	100	273	353	286
TKN (mg/L)	< .2		.34	.36	< .2	.54	.26
Total Phosphorus (mg/L)	.014		.018	.022	< .01	< .01	.013
Total Suspended Solids (mg/L)	8		8	12	7	5	< 5
Zinc (ug/L)	< 10		< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	508.2		442	375	781	850	762
DissolvedOxygen(mg/L)	5.85		6.43	5.74	5.65	7.46	14.35
GageHeight(ft)		17.93		18.71		19.49	18.73
pH(su)	7.12		7.72	7.43	8.39	7.35	8.27
Saturation(percent)	68.4		75.1	70.1	62.7	76.8	109.1
Temperature(deg C)	23		23.06	25.44	20.27	16.59	3.77
UncorrectedConductance(umhos/cm)			426	378	710	713	453

River Code:	**09-530-000**	Stream:	**ELK FORK**
River Mile:	**13.3**	Location:	ELK FORK 1 MI. E OF MCARTHUR @ ST. RT. 50
Basin:	Southeast Ohio River Tribs	Drainage:	24.5 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	62.6	175	81.1	96.6	150
Aluminum (ug/L)	287	< 200	378	264	336
Ammonia (mg/L)	.21	4.92	.171	.235	.619
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	40	34	40	46	41
Bromide (ug/L)		223	44.3		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	45.5	50.8	53.4	57.5	63.5
Chloride (mg/L)	18.2	87.2	21.7	34.6	76
Chlorophyll_a (ug/L)		9.8			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	24
Conductivity (umhos/cm)	433	796	479	603	760
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	174	187	196	214	240
Iron (ug/L)	892	596	1170	894	1080
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	14.6	14.6	15.3	17	19.7
Manganese (ug/L)	600	476	579	1010	1190
Nickel (ug/L)	6.3	4.8	6.6	8.5	8.3
Nitrate, nitrite (mg/L)	.4	1.22	.44	.75	1.66
Nitrite (mg/L)	.049	.286	.052	.084	.299
Orthophosphate, dissolved (mg/L)		.981			
Pheophytin_a (ug/L)		6.2			
Potassium (mg/L)	2.8	6.4	3.8	4.4	7.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	15.3	78.3	18.2	27.6	76.7
Solids, Total Dissolved (mg/L)	268	442	326	394	470
Strontium (ug/L)	245	314	272	275	344
Sulfate (mg/L)	120	89.6	119	127	123
TKN (mg/L)	.3	5.06	.51	.65	1.57
Total Phosphorus (mg/L)	.057	1.19	.1	.085	.296
Total Suspended Solids (mg/L)	13	16	15	7	21
Zinc (ug/L)	< 10	< 10	< 10	11	< 10
CorrectedConductance(umhos/cm)	422	793	511	601	720
DissolvedOxygen(mg/L)	7.54	3.38	12.91	5.64	6.18
pH(su)	7.68	7.12	7.75	6.56	7.63
Saturation(percent)	85.5	37.9	150.1	69.2	68.3
Temperature(deg C)	21.53	20.9	22.79	25.7	20.15
UncorrectedConductance(umhos/cm)	394		489	609	654

River Code:	**09-530-000**	Stream:	**ELK FORK**
River Mile:	**0.0**	Location:	ELK FORK NE OF RADCLIFF @ CO. RD. 43B
Basin:	Southeast Ohio River Tribs	Drainage:	59.8 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**	**06-22-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	43.1	29.7	25.2	27.4	29.6	40.7	61.8
Aluminum (ug/L)	< 200	381	1160	474	379	213	< 200
Ammonia (mg/L)	.144	.085	.101	.054	< .05	.06	.073
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	35	31	34	32	31	30	42
Bromide (ug/L)	27.6	< 20	27.8	< 20	< 20		43
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	46.6	30.7	27.7	26	28.2	35.1	54.5
Chloride (mg/L)	14.9	9.6	31.9	7.2	5.9	9.4	14.1
Chlorophyll_a (ug/L)							1.2
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	417	288	337	247	271	340	537
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	187	122	110	103	117	148	235
Iron (ug/L)	520	742	2450	1120	886	669	719
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	17.2	10.9	9.8	9.2	11.2	14.6	24.1
Manganese (ug/L)	1040	509	564	355	354	432	680
Nickel (ug/L)	9.6	7.1	8.1	6.1	4.2	4.5	3.6
Nitrate, nitrite (mg/L)	.27	.46	.36	.22	.14	.24	.2
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)							< 1.4
Potassium (mg/L)	2.3	2.2	< 2	< 2	< 2	2.2	3.1
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	12.4	9	16.8	7	6.8	10.1	13.4
Solids, Total Dissolved (mg/L)	276	182	214	172	190	244	368
Strontium (ug/L)	195	126	103	109	134	172	270
Sulfate (mg/L)	137	88	86.2	74.8	91.4	112	179
TKN (mg/L)	.25	.34	.2	< .2	.26	.24	.29
Total Phosphorus (mg/L)	< .01	.022	.056	.015	.023	.013	.023
Total Suspended Solids (mg/L)	< 5	8	60	18	8	5	< 5
Zinc (ug/L)	23	12	19	10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	452	301	331	255	279.1	361	537.8
DissolvedOxygen(mg/L)	24.65	16.69	16.16	9.44	8.33	8.1	5.84
pH(su)	8.49	7.23	7.49	7.62	7.2	7.9	7.15
Saturation(percent)	170.8	144	114.8	87.9	84.7	85.6	65.6
Temperature(deg C)	.41	8.84	1.32	12.14	16.2	18.01	21
UncorrectedConductance(umhos/cm)	240	208	181	192		312	

Sample Type: Inorganic	07-06-2016	08-03-2016	09-13-2016	09-14-2016	10-17-2016	12-13-2016
Acidity (mg/L)	< 5	< 5	5	< 5	< 5	< 5
Alkalinity (mg/L)	54.5	57.1	90.4	88.1	82.8	57.2
Aluminum (ug/L)	< 200	< 200	< 200	< 200	951	< 200
Ammonia (mg/L)	.067	.053	.067	< .05	.06	.108
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	43	31	39	41	47	27
Bromide (ug/L)	42					
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	60.7	37.9	56.1	59.7	55	71.5
Chloride (mg/L)	17.1	11.3	19	18.7	20.1	24.4
Chlorophyll_a (ug/L)						
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	23	< 20
Conductivity (umhos/cm)	569	377	541	530	520	680
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	259	153	232	244	225	295
Iron (ug/L)	619	879	683	801	3820	462
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	26.2	14.1	22.4	23.1	21.2	28.4
Manganese (ug/L)	409	287	638	615	903	137
Nickel (ug/L)	4.5	3.3	3.4	3.7	6	4.3
Nitrate, nitrite (mg/L)	.31	.32	.13	.15	.14	.87
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01	< .01
Pheophytin_a (ug/L)						
Potassium (mg/L)	3.7	3.5	4.1	4.4	5	4.1
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	15.8	10.8	17.8	19.3	17.8	22.1
Solids, Total Dissolved (mg/L)	434	260	386	372	352	480
Strontium (ug/L)	287	158	274	299	252	329
Sulfate (mg/L)	201	103	159	154	158	249
TKN (mg/L)	.37	.51	.35	< .2	.95	.44
Total Phosphorus (mg/L)	.012	.022	.023	< .01	.124	.033
Total Suspended Solids (mg/L)	5	< 5	< 5	7	90	< 5
Zinc (ug/L)	< 10	< 10	12	< 10	11	< 10
CorrectedConductance(umhos/cm)	553	367	576	571	517	691
DissolvedOxygen(mg/L)	6.47	6.04	5.79	6.13	7.76	15.79
pH(su)	7.53	7.74	7.61	8.97	7.53	7.98
Saturation(percent)	75.7	73.6	65.3	66.4	78.4	118.6
Temperature(deg C)	23.16	25.33	21.23	19.14	15.8	3.34
UncorrectedConductance(umhos/cm)	534	401	534	507	426	405

River Code:	**09-563-000**	Stream:	**HEWETT FORK**
River Mile:	**0.0**	Location:	HEWETT FORK SE OF LAKE HOPE @ MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	40.5 sq mi

Sample Type: Inorganic	**05-25-2016**	**06-22-2016**	**07-05-2016**	**07-27-2016**	**08-29-2016**	**09-21-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	39.7	35.6	38.6	42.5	63.8	57.1
Aluminum (ug/L)	< 200	< 200	1130	< 200	< 200	< 200
Ammonia (mg/L)	.065	.092	.052	.069	.072	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	28	50	44	34	36	47
Bromide (ug/L)		28.8				
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	26	52.9	41.4	35.6	46.3	54.3
Chloride (mg/L)	6.1	8.1	8	6.4	10.1	8.1
Chlorophyll_a (ug/L)		.7				
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	245	453	324	331	380	443
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	97	184	142	123	161	182
Iron (ug/L)	680	424	2920	891	589	487
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	7.8	12.7	9.3	8.2	11.1	11.2
Manganese (ug/L)	360	607	472	453	365	1060
Nickel (ug/L)	2.7	2.8	4.4	2.2	< 2	2.3
Nitrate, nitrite (mg/L)	< .1	.17	.22	.16	.15	.13
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01				
Pheophytin_a (ug/L)		< 1.4				
Potassium (mg/L)	< 2	2.2	2.7	2.3	2.6	2.6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.2	13.9	11.6	10.1	13.7	13.3
Solids, Total Dissolved (mg/L)	192	320	232	224	256	304
Strontium (ug/L)	115	237	179	160	195	222
Sulfate (mg/L)	69.1	163	104	87.7	107	142
TKN (mg/L)	< .2	.31	.43	.35	.32	< .2
Total Phosphorus (mg/L)	< .01	.01	.046	.014	.046	.012
Total Suspended Solids (mg/L)	< 5	< 5	25	< 5	5	< 5
Zinc (ug/L)	< 10	< 10	25	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	202	463.1	337	325	396	448
DissolvedOxygen(mg/L)	9.1	6.2	8.01	6.89	5.41	5.52
pH(su)	7.28	6.98	7.63	7.69	8	8.51
Saturation(percent)	94.5	71.2	89.6	83.3	64.5	60.5
Temperature(deg C)	17.13	22.1	20.81	24.87	24.1	19.7
UncorrectedConductance(umhos/cm)	171		310	324	389	403

River Code:	**09-564-000**	Stream:	**ROCKCAMP CREEK**
River Mile:	**1.5**	Location:	ROCKCAMP CREEK S OF MINERAL @ ST. RT. 356
Basin:	Southeast Ohio River Tribs	Drainage:	5.8 sq mi

Sample Type: Inorganic	**05-25-2016**	**06-22-2016**	**07-05-2016**	**07-27-2016**	**08-29-2016**	**09-21-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	67.8	33.6	76.3	90.2	60.6	40.5
Aluminum (ug/L)	215	614	459	1030	< 200	< 200
Ammonia (mg/L)	.058	.083	< .05	.051	.074	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	39	55	49	49	48	32
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	24.7	13.6	30.2	32.1	20.6	13.2
Chloride (mg/L)	13.4	13.5	19.9	16.8	31.4	5.8
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	21	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	231	167	261	283	244	148
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	91	52	107	111	75	49
Iron (ug/L)	985	4440	1490	2280	1910	1450
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	7	4.4	7.6	7.6	5.6	4
Manganese (ug/L)	392	941	263	222	384	241
Nickel (ug/L)	< 2	2.5	< 2	2.1	< 2	< 2
Nitrate, nitrite (mg/L)	.13	.11	< .1	.2	.15	.23
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	< 2	2.8	3.6	2	< 2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	11	10.1	14.1	13.8	19.6	7.3
Solids, Total Dissolved (mg/L)	164	110	170	166	154	102
Strontium (ug/L)	123	61	142	133	141	48
Sulfate (mg/L)	31.4	22.2	30.8	27.6	18.1	21.7
TKN (mg/L)	< .2	.42	.41	.43	.46	< .2
Total Phosphorus (mg/L)	.018	.045	.035	.052	.033	< .01
Total Suspended Solids (mg/L)	9	111	20	34	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	195	161	273	290	251	153
DissolvedOxygen(mg/L)	8.44	8.88	7.53	5.85	5.72	7.59
pH(su)	7.4	7.76	7.76	7.42	7.59	8.04
Saturation(percent)	90.3	95.2	86.1	69.2	67.6	84.6
Temperature(deg C)	18.62	18.73	21.95	23.75	23.71	20.65
UncorrectedConductance(umhos/cm)	171	142	258	284	245	140

River Code:	**09-576-000**	Stream:	**HONEY FORK**
River Mile:	**0.0**	Location:	HONEY FORK 1 MI W OF NEW PLYMOUTH @ MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	10.5 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	7.8	< 5	< 5
Alkalinity (mg/L)	42.7	63.7	< 5	65	23.3
Aluminum (ug/L)	< 200	< 200	960	< 200	< 200
Ammonia (mg/L)	.091	.116	.064	.101	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	32	42	41	36	36
Bromide (ug/L)			49		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	17.1	21.2	40	19.7	54.9
Chloride (mg/L)	7.7	9.7	18	7.2	50.1
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	197	225	478	221	598
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	75	88	184	79	233
Iron (ug/L)	691	1580	380	1200	156
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	7.8	8.5	20.4	7.2	23.2
Manganese (ug/L)	192	949	5850	510	698
Nickel (ug/L)	< 2	2.5	33.6	2.4	5.7
Nitrate, nitrite (mg/L)	.15	.11	.14	.19	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.6	2.5	3.3	4.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	6.5	8	12.4	5.9	35.3
Solids, Total Dissolved (mg/L)	114	138	364	128	404
Strontium (ug/L)	84	101	134	84	178
Sulfate (mg/L)	39.9	29.9	182	28	185
TKN (mg/L)	< .2	.36	< .2	.59	.27
Total Phosphorus (mg/L)	.01	.02	.01	.029	.023
Total Suspended Solids (mg/L)	< 5	8	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	42	< 10	< 10
CorrectedConductance(umhos/cm)	192	224	501	228	559
DissolvedOxygen(mg/L)	7.52	4.63	7.14	5.47	6.23
pH(su)	7.49	6.76	6.98	7.32	8.13
Saturation(percent)	88.6	50.7	84.4	67.7	65.9
Temperature(deg C)	23.5	19.75	23.68	26.2	18.01
UncorrectedConductance(umhos/cm)	187	202	489	233	485

River Code:	**09-539-000**	Stream:	**INDIAN CREEK**
River Mile:	**1.6**	Location:	INDIAN CREEK UPST. RIO GRANDE WWTP @ ST. RT. 325
Basin:	Southeast Ohio River Tribs	Drainage:	10.4 sq mi

Sample Type: Inorganic	**05-31-2016**	**07-06-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	80.4	71.1	98.2	160
Aluminum (ug/L)	< 200	344	503	< 200
Ammonia (mg/L)	.106	.079	.088	.575
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	50	60	65	94
Bromide (ug/L)		27.5		
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	24.6	26.4	29.7	43.6
Chloride (mg/L)	22.5	21.7	27.4	52.4
Chromium (ug/L)	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	24
Conductivity (umhos/cm)	269	267	324	465
Copper, Low Level (ug/L)	< 2	< 2	4.1	< 2
Hardness, Total (mg/L)	90	95	104	155
Iron (ug/L)	801	976	1730	787
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	6.9	7.1	7.3	11.3
Manganese (ug/L)	352	256	632	2320
Nickel (ug/L)	< 2	2	2.1	2.4
Nitrate, nitrite (mg/L)	.31	3	.28	< .1
Nitrite (mg/L)	.025	.032	< .02	< .02
Potassium (mg/L)	2.9	3.9	3.8	5.4
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.5	13.6	19.9	32.5
Solids, Total Dissolved (mg/L)	154	186	190	268
Strontium (ug/L)	108	110	117	192
Sulfate (mg/L)	24.2	22.5	22.4	12.6
TKN (mg/L)	.32	.61	.52	1.14
Total Phosphorus (mg/L)	.017	.038	.036	.025
Total Suspended Solids (mg/L)	5	9	28	5
Zinc (ug/L)	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	282	270	327	485
DissolvedOxygen(mg/L)	10.68	9.64	5.57	3.62
pH(su)	7.61	7.49	7.56	7.42
Saturation(percent)	119.1	110.5	66.3	39
Temperature(deg C)	20.66	22.08	24.09	18.92
UncorrectedConductance(umhos/cm)	259	255	321	428

River Code:	**09-567-000**	Stream:	**GRASS RUN**
River Mile:	**0.0**	Location:	GRASS RUN N OF MINERAL @ ST. RT. 356
Basin:	Southeast Ohio River Tribs	Drainage:	2.7 sq mi

Sample Type: Inorganic	**05-25-2016**	**06-22-2016**	**07-05-2016**	**07-27-2016**	**08-29-2016**	**09-21-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	68.3	152	97.4	159	146	186
Aluminum (ug/L)	< 200	< 200	425	< 200	< 200	588
Ammonia (mg/L)	.059	.14	.059	.107	.182	.37
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	33	57	47	62	62	79
Bromide (ug/L)		61.2				
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	22.3	40.2	34.2	44.1	46	49.2
Chloride (mg/L)	7.1	53.2	13.8	73.9	32.4	100
Chlorophyll_a (ug/L)		2				
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	26
Conductivity (umhos/cm)	203	443	271	558	392	656
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	83	141	120	151	157	169
Iron (ug/L)	479	648	1250	555	548	1870
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	2.1
Magnesium (mg/L)	6.7	9.9	8.4	9.9	10.2	11.1
Manganese (ug/L)	282	1240	321	1250	1400	2450
Nickel (ug/L)	< 2	< 2	< 2	< 2	< 2	3.2
Nitrate, nitrite (mg/L)	.1	.11	.21	< .1	.16	.14
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	.032
Orthophosphate, dissolved (mg/L)		< .01				
Pheophytin_a (ug/L)		< 1.4				
Potassium (mg/L)	< 2	2.7	2.8	3.3	3.5	4.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.6	30.7	13.2	50.6	24.9	64.2
Solids, Total Dissolved (mg/L)	148	258	172	304	230	364
Strontium (ug/L)	106	176	142	194	194	217
Sulfate (mg/L)	26.9	11.6	29.5	11.4	23.4	10.9
TKN (mg/L)	.2	.46	.46	1.51	.61	.84
Total Phosphorus (mg/L)	.011	.028	.042	.025	.03	.028
Total Suspended Solids (mg/L)	< 5	8	12	6	10	44
Zinc (ug/L)	< 10	< 10	10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	170	490.2	287	572	406	673
DissolvedOxygen(mg/L)	8.98	5.3	7.17	5.01	5.77	5.63
pH(su)	7.45	7.28	7.83	7.56	7.52	7.6
Saturation(percent)	94.6	57.2	80.3	59.6	68.2	60.6
Temperature(deg C)	17.84	18.9	20.84	23.94	23.66	18.79
UncorrectedConductance(umhos/cm)	147		265	561	396	593

River Code:	**09-514-000**	Stream:	**DICKASON RUN**
River Mile:	**0.1**	Location:	DICKASON RUN NEAR KEYSTONE @ ORPHEUS-KEYSTONE RD.
Basin:	Southeast Ohio River Tribs	Drainage:	26.9 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	127	201	86.5	80.2	198
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.086	.05	.057	.144	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	37	49	39	42	50
Bromide (ug/L)		68.2	45.6		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	130	71.5	77.6	63.8	218
Chloride (mg/L)	15.3	13.1	29.2	28.7	11.2
Chlorophyll_a (ug/L)		1.3			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	1180	2090	739	659	2160
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	2.1
Hardness, Total (mg/L)	525	548	309	246	912
Iron (ug/L)	479	328	979	1090	237
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	48.6	89.8	27.9	21	89.2
Manganese (ug/L)	1080	875	965	990	560
Nickel (ug/L)	9	8.4	7	8.4	9.2
Nitrate, nitrite (mg/L)	.29	.52	.26	.25	.56
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		< 1.4			
Potassium (mg/L)	6.8	13.2	5.4	4.8	13.4
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	77.4	175	41.7	37.1	177
Solids, Total Dissolved (mg/L)	936	1830	520	448	1890
Strontium (ug/L)	1160	2310	525	427	2280
Sulfate (mg/L)	497	1040	243	231	1080
TKN (mg/L)	.43	.34	.37	.59	.29
Total Phosphorus (mg/L)	.022	.02	.015	.02	.01
Total Suspended Solids (mg/L)	< 5	< 5	8	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	1153	2124	721	653	2123
DissolvedOxygen(mg/L)	6.8	6.76	7.07	7.02	6.49
pH(su)	7.67	7.73	7.91	7.63	7.55
Saturation(percent)	78.8	75.5	81.6	83.3	69.9
Temperature(deg C)	22.52	20.4	22.37	23.85	18.6
UncorrectedConductance(umhos/cm)	1099		685	639	1864

River Code:	**09-526-000**	Stream:	**TRIPP RUN**
River Mile:	**0.3**	Location:	TRIPP RUN NEAR HAMDEN @ ST. RT. 349
Basin:	Southeast Ohio River Tribs	Drainage:	0.9 sq mi

Sample Type: Inorganic	**04-12-2016**	**04-27-2016**	**05-11-2016**	**06-07-2016**	**06-23-2016**
Ammonia (mg/L)	.059	.312	.093	.087	.112
Nitrate, nitrite (mg/L)	.34	.28	.31	.22	.37
Orthophosphate, dissolved (mg/L)	.013	.014	.019	< .01	.048
Total Phosphorus (mg/L)	.018	.061	.067	.036	.222
CorrectedConductance(umhos/cm)	249	403	346	487	201
DissolvedOxygen(mg/L)	12.26	8.99	8.77	7.18	6.62
pH(su)	7.45	7.5	7.48	7.75	7.61
Saturation(percent)	109	88.1	91.2	78.4	71.9
Temperature(deg C)	10.11	14.4	17.19	19.6	19.32
UncorrectedConductance(umhos/cm)	178	321	294	437	179

River Code:	**09-510-004**	Stream:	**TRIB. TO L. RACCOON CREEK (RM 30.65)**
River Mile:	**0.5**	Location:	TRIB. TO L. RACCOON CREEK (30.65) UPST. LAKE ALMA @ ROAD
Basin:	Southeast Ohio River Tribs	Drainage:	0.4 sq mi

Sample Type: Inorganic	**06-30-2016**	**07-25-2016**	**08-18-2016**
Acidity (mg/L)		< 5	< 5
Alkalinity (mg/L)		61.8	68.8
Aluminum (ug/L)		< 200	< 200
Ammonia (mg/L)	< .05	< .05	< .05
Arsenic (ug/L)		< 2	< 2
Barium (ug/L)		33	35
Cadmium (ug/L)		< .2	< .2
Calcium (mg/L)		78.3	85
Chloride (mg/L)		< 5	< 5
Chromium (ug/L)		< 2	< 2
COD, Chemical Oxygen Demand (mg/L)		< 20	< 20
Conductivity (umhos/cm)		578	538
Copper, Low Level (ug/L)		< 2	3.5
Hardness, Total (mg/L)		269	289
Iron (ug/L)		159	297
Lead (ug/L)		< 2	< 2
Magnesium (mg/L)		17.8	18.7
Manganese (ug/L)		339	490
Nickel (ug/L)		7.3	10.3
Nitrate, nitrite (mg/L)	< .1	< .1	< .1
Nitrite (mg/L)		< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01	.022
Potassium (mg/L)		3.6	4
Selenium (ug/L)		< 2	< 2
Sodium (mg/L)		< 5	5.5
Solids, Total Dissolved (mg/L)		382	398
Strontium (ug/L)		188	206
Sulfate (mg/L)		209	215
TKN (mg/L)		< .2	.38
Total Phosphorus (mg/L)	.01	< .01	< .01
Total Suspended Solids (mg/L)		< 5	< 5
Zinc (ug/L)		< 10	< 10
CorrectedConductance(umhos/cm)	552	563	574
DissolvedOxygen(mg/L)	6.53	13.04	7.02
pH(su)	7.12	7.02	7.02
Saturation(percent)	71.2	161.7	86
Temperature(deg C)	19.5	26.24	25.58
UncorrectedConductance(umhos/cm)	494	577	580

River Code:	**09-527-000**	Stream:	**JOHNSON RUN**
River Mile:	**0.9**	Location:	JOHNSON RUN NW OF HAMDEN @ TRIPP RD.
Basin:	Southeast Ohio River Tribs	Drainage:	2.1 sq mi

Sample Type: Inorganic	**04-12-2016**	**04-27-2016**	**05-11-2016**	**06-07-2016**	**06-23-2016**
Ammonia (mg/L)	< .05	< .05	.051	.078	.25
Nitrate, nitrite (mg/L)	.22	.14	.15	.22	.54
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	.038
Total Phosphorus (mg/L)	< .01	.028	.032	.03	1.26
CorrectedConductance(umhos/cm)	116	116	122	169	91
DissolvedOxygen(mg/L)	12.7	10.59	10.69	7.88	8.12
pH(su)	7.54	7.7	7.6	7.97	7.23
Saturation(percent)	110.3	103	106.5	85.7	88.2
Temperature(deg C)	9.16	14.1	15.17	19.42	19.35
UncorrectedConductance(umhos/cm)	81	92	99	151	82

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**12.7**	Location:	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.
Basin:	Southeast Ohio River Tribs	Drainage:	99.0 sq mi

Sample Type: Inorganic	**01-21-2016**	**01-23-2017**	**02-17-2016**	**03-17-2016**	**04-27-2016**	**05-26-2016**	**06-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5	
Alkalinity (mg/L)	63.8	34.3	30.3	36.3	36.2	60.3	
Aluminum (ug/L)	< 200	713	1420	689	859	< 200	
Ammonia (mg/L)	.235	.07	.127	.062	< .05	.059	
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Barium (ug/L)	32	29	30	31	39	30	
Bromide (ug/L)	< 100	< 20	28.4	< 20	< 20		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2	
Calcium (mg/L)	61.4	36.5	40.5	36.1	37.3	51	
Chloride (mg/L)	14.7	9.5	29.2	9.8	6.5	12.1	
Chlorophyll_a (ug/L)							
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
COD, Chemical Oxygen Demand (mg/L)	138	< 20	< 20	< 20	< 20	< 20	
Conductivity (umhos/cm)	587	339	441	337	333	484	
Copper, Low Level (ug/L)	< 2	< 2	2	< 2	< 2	< 2	
Hardness, Total (mg/L)	225	133	146	133	136	194	
Iron (ug/L)	901	1130	2820	1410	2110	527	
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Magnesium (mg/L)	17.3	10.2	10.9	10.4	10.4	16.2	
Manganese (ug/L)	1380	649	843	571	717	549	
Nickel (ug/L)	13.9	10.3	12.2	< 2	8.7	5.3	
Nitrate, nitrite (mg/L)	.49	.43	.41	.31	.29	.3	
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02	
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	< .01	< .01	
Pheophytin_a (ug/L)							
Potassium (mg/L)	3.8	2.7	2.6	2.4	2.7	3.5	
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2	
Sodium (mg/L)	32.5	14	22	14	13	27.1	
Solids, Total Dissolved (mg/L)	406	220	276	226	228	330	
Strontium (ug/L)	320	161	172	171	202	319	
Sulfate (mg/L)	206	104	129	105	111	166	
TKN (mg/L)	.32	.34	< .2	.24	.3	< .2	
Total Phosphorus (mg/L)	< .01	.02	.049	.018	.033	.016	
Total Suspended Solids (mg/L)	< 5	13	47	18	18	< 5	
Zinc (ug/L)	21	15	24	15	11	23	
CorrectedConductance(umhos/cm)	611	353	402	347	338.4	471	
DissolvedOxygen(mg/L)	11.89	13.82	22.87	9.67	7.8	13.83	
Flow(cfs)	39	186	542	217		53	22
GageHeight(ft)	4.29	6	9.02	6.4		4.2	3.84
pH(su)	7.77	6.73	8.01	7.53	7.01	7.74	
Saturation(percent)	82.8	119.7	157.3	91.5	79.3	151.6	
Temperature(deg C)	.58	9.02	.15	12.85	16.2	19.77	
UncorrectedConductance(umhos/cm)	326	246	211	266		424	

Sample Type: Inorganic	06-22-2016	07-06-2016	08-03-2016	09-02-2015	09-13-2016	10-17-2016	12-06-2016
Acidity (mg/L)	< 5	< 5	< 5	2.8	< 5	< 5	< 5
Alkalinity (mg/L)	117	74.9	53.2	137	117	114	85.1
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	< .05	.075	.076	.043	< .05	.08	.083
Arsenic (ug/L)	< 2	< 2	< 2	.3	< 2	< 2	< 2
Barium (ug/L)	36	38	31	38	32	33	28
Bromide (ug/L)	40.5	31.8					
Cadmium (ug/L)	< .2	< .2	< .2	.02	< .2	< .2	< .2
Calcium (mg/L)	70.7	68.1	40.8	99.2	64.2	91.3	81.4
Chloride (mg/L)	21.8	13	9.4	21.2	24.7	25.1	18.8
Chlorophyll_a (ug/L)	.5						
Chromium (ug/L)	< 2	< 2	< 2	.1	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	9	< 20	< 20	< 20
Conductivity (umhos/cm)	734	622	409	1010	697	912	746
Copper, Low Level (ug/L)	< 2	< 2	< 2	1.1	< 2	< 2	< 2
Hardness, Total (mg/L)	272	251	152	372	240	331	300
Iron (ug/L)	350	400	634	247	279	186	441
Lead (ug/L)	< 2	< 2	< 2	.1	< 2	< 2	< 2
Magnesium (mg/L)	23.2	19.7	11.6	30.2	19.3	24.9	23.5
Manganese (ug/L)	188	664	506	213	97	134	706
Nickel (ug/L)	3.2	6.8	5.8	4.9	3.5	6.3	9.3
Nitrate, nitrite (mg/L)	.42	.61	.28	.5	.68	1.05	1.02
Nitrite (mg/L)	< .02	< .02	< .02	.011	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01		< .01	< .01	< .01
Pheophytin_a (ug/L)	< 1.4						
Potassium (mg/L)	5.7	5.1	3.2	7.3	7	8	6.6
Selenium (ug/L)	< 2	< 2	< 2	.7	< 2	< 2	< 2
Sodium (mg/L)	46.4	36.6	18	74.2	50.6	61.5	48.2
Solids, Total Dissolved (mg/L)	538	428	260	706	456	658	392
Strontium (ug/L)	526	417	221	724	446	566	465
Sulfate (mg/L)	220	213	118	373	205	327	270
TKN (mg/L)	< .2	.3	.31	.3	.22	.55	.22
Total Phosphorus (mg/L)	.015	.011	.018	.008	.02	< .01	.015
Total Suspended Solids (mg/L)	< 5	< 5	< 5	3	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	4	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	740	612	386	1003	701	895	747
DissolvedOxygen(mg/L)	6.65	6.34	9.96	7.38	6.67	8.61	12.48
Flow(cfs)		42	60	20	31	13	17
GageHeight(ft)		4.38	4.46	3.65	3.76	3.88	4.07
pH(su)	7.6	7.75	7.94	7.93	7.79	7.43	7.73
Saturation(percent)	76.2	72.9	81.1	85.3	73.9	88.4	100.6
Temperature(deg C)	21.9	22.17	24.71	22.43	20.22	16.47	6.06
UncorrectedConductance(umhos/cm)		579	387	954	637	749	477

Sample Type: Inorganic	**12-13-2016**
Acidity (mg/L)	< 5
Alkalinity (mg/L)	69.7
Aluminum (ug/L)	< 200
Ammonia (mg/L)	.178
Arsenic (ug/L)	< 2
Barium (ug/L)	29
Bromide (ug/L)	
Cadmium (ug/L)	< .2
Calcium (mg/L)	82.8
Chloride (mg/L)	18.9
Chlorophyll_a (ug/L)	
Chromium (ug/L)	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20
Conductivity (umhos/cm)	797
Copper, Low Level (ug/L)	< 2
Hardness, Total (mg/L)	301
Iron (ug/L)	411
Lead (ug/L)	< 2
Magnesium (mg/L)	23
Manganese (ug/L)	1300
Nickel (ug/L)	13.4
Nitrate, nitrite (mg/L)	.99
Nitrite (mg/L)	.034
Orthophosphate, dissolved (mg/L)	< .01
Pheophytin_a (ug/L)	
Potassium (mg/L)	5.8
Selenium (ug/L)	< 2
Sodium (mg/L)	47
Solids, Total Dissolved (mg/L)	582
Strontium (ug/L)	439
Sulfate (mg/L)	305
TKN (mg/L)	.34
Total Phosphorus (mg/L)	.017
Total Suspended Solids (mg/L)	< 5
Zinc (ug/L)	12
CorrectedConductance(umhos/cm)	798
DissolvedOxygen(mg/L)	14.45
Flow(cfs)	40
GageHeight(ft)	4.63
pH(su)	7.95
Saturation(percent)	110.9
Temperature(deg C)	4.14
UncorrectedConductance(umhos/cm)	480

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**27.9**	Location:	L. RACCOON CREEK UPST. MEADOW RUN @ CO. RD. 39
Basin:	Southeast Ohio River Tribs	Drainage:	48.0 sq mi

Sample Type: Inorganic	**04-27-2016**	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	40.7	37.2	63.5	68.6	50.9	69.9
Aluminum (ug/L)	291	< 200	< 200	211	328	< 200
Ammonia (mg/L)	< .05	.104	< .05	.093	.091	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	33	26	42	46	32	37
Bromide (ug/L)	< 20		24.3	25.5		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	29.4	19	27.7	44.1	23.2	28.2
Chloride (mg/L)	8.6	7	9.1	12.9	8.4	8.8
Chlorophyll_a (ug/L)			7.6			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	270	198	278	377	231	274
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	110	73	105	161	86	105
Iron (ug/L)	786	636	489	908	1180	557
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	9	6.3	8.7	12.4	6.9	8.5
Manganese (ug/L)	428	303	1890	625	489	984
Nickel (ug/L)	3	< 2	2.9	3.2	3.1	2.7
Nitrate, nitrite (mg/L)	.1	.12	< .1	.3	.18	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01		< .01			
Pheophytin_a (ug/L)			73.6			
Potassium (mg/L)	2.2	2	2.4	3.6	2.4	3.4
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	10.6	7.1	9.4	13.3	8.2	8.8
Solids, Total Dissolved (mg/L)	174	146	192	260	148	188
Strontium (ug/L)	151	86	138	200	106	130
Sulfate (mg/L)	78.1	44.1	59.7	98	42.3	51.8
TKN (mg/L)	.27	.37	.54	.45	.48	.79
Total Phosphorus (mg/L)	.031	.029	.052	.023	.042	.078
Total Suspended Solids (mg/L)	8	10	9	8	22	11
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10	10
CorrectedConductance(umhos/cm)	275.8	205	281.6	377	229	267
DissolvedOxygen(mg/L)	6.99	6.49	4.95	5.71	5.22	4.4
pH(su)	7.07	7.94	7.14	7.6	7.51	7.8
Saturation(percent)	73.4	78	56.4	66.8	63.4	48.7
Temperature(deg C)	17.6	24.61	21.7	23.16	25.18	20.21
UncorrectedConductance(umhos/cm)		204		363	230	243

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**36.7**	Location:	L. RACCOON CREEK UPST LAKE RUPERT @ CO. RD. 25
Basin:	Southeast Ohio River Tribs	Drainage:	12.1 sq mi

Sample Type: Inorganic	**06-01-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	32.3	57.3	47.8	43.5	75.3
Aluminum (ug/L)	< 200	< 200	379	< 200	< 200
Ammonia (mg/L)	.063	.251	.06	.078	.255
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	32	46	37	39	52
Bromide (ug/L)			< 20		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	13.5	17.4	19.6	17.1	21.1
Chloride (mg/L)	8.9	15.8	10.2	11.9	14.4
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	152	210	195	184	230
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	54	67	74	66	78
Iron (ug/L)	630	1070	1210	1100	816
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	5	5.8	6	5.6	6.2
Manganese (ug/L)	222	1050	235	491	1720
Nickel (ug/L)	2.2	2.6	2.2	2.6	2.5
Nitrate, nitrite (mg/L)	.52	.1	.22	.21	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2	2.1	2	2.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	6.5	10.3	8.8	9.3	10.4
Solids, Total Dissolved (mg/L)	86	126	120	110	142
Strontium (ug/L)	58	73	77	70	85
Sulfate (mg/L)	27.5	22.8	32.1	29.8	22.7
TKN (mg/L)	< .2	.34	.23	.31	.6
Total Phosphorus (mg/L)	.017	.016	.021	.016	.024
Total Suspended Solids (mg/L)	< 5	< 5	9	< 5	6
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	164	211	193	189	226
DissolvedOxygen(mg/L)	7.54	3.44	5.71	6.76	2.41
pH(su)	7.56	7.71	7.7	7.73	8.01
Saturation(percent)	84.9	38.1	64.1	78	25.8
Temperature(deg C)	21.2	20.23	21.04	22.48	18.74
UncorrectedConductance(umhos/cm)	152	192	179	180	199

River Code:	**09-524-000**	Stream:	**MEADOW RUN**
River Mile:	**3.1**	Location:	MEADOW RUN UPST. JENO'S
Basin:	Southeast Ohio River Tribs	Drainage:	5.1 sq mi

Sample Type: Inorganic	**06-22-2016**	**07-06-2016**	**07-28-2016**	**08-24-2016**	**09-26-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	35.7	66.6	69.9	64.5	59.3
Aluminum (ug/L)	439	431	2210	1580	233
Ammonia (mg/L)	.208	.084	.083	.1	.116
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	66	37	48	46	55
Bromide (ug/L)		33.7			
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	86.1	49.9	34.8	61.6	72.9
Chloride (mg/L)	34.7	35.8	25.9	45.9	36.2
Chromium (ug/L)	< 2	< 2	< 2	< 4	< 2
COD, Chemical Oxygen Demand (mg/L)	30	< 20	33	< 20	20
Conductivity (umhos/cm)	791	498	356	587	675
Copper, Low Level (ug/L)	< 2	< 2	3	< 4	< 2
Hardness, Total (mg/L)	308	179	125	216	260
Iron (ug/L)	645	569	3510	2650	428
Lead (ug/L)	< 2	< 2	2.6	2	< 2
Magnesium (mg/L)	22.6	13.2	9.3	15.1	18.9
Manganese (ug/L)	7190	2460	1230	1810	1500
Nickel (ug/L)	18.8	24.5	14.2	16.5	6.5
Nitrate, nitrite (mg/L)	.35	.26	.2	.25	< .1
Nitrite (mg/L)	.051	< .02	< .02	< .02	< .02
Potassium (mg/L)	5.8	4	4	5.1	8.4
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	27.8	31.2	18.8	37	28.1
Solids, Total Dissolved (mg/L)	546	340	238	396	454
Strontium (ug/L)	248	141	113	183	204
Sulfate (mg/L)	308	119	68.2	151	229
TKN (mg/L)	.63	.39	.77	.62	.65
Total Phosphorus (mg/L)	.051	.023	.129	.037	.04
Total Suspended Solids (mg/L)	9	7	121	27	13
Zinc (ug/L)	11	18	30	16	< 10
CorrectedConductance(umhos/cm)	729	485	352	597	690
DissolvedOxygen(mg/L)	4.94	7.44	7.28	5.55	3.9
pH(su)	7.87	7.99	7.92	7.37	7.65
Saturation(percent)	55.4	82.7	84.8	60.3	41.5
Temperature(deg C)	20.87	20.47	22.93	19.24	18.23
UncorrectedConductance(umhos/cm)	671	443	338	531	601

River Code:	**09-510-002**	Stream:	**SUGAR RUN**
River Mile:	**0.2**	Location:	SUGAR RUN E OF HAMDEN @ TWP. RD. 1
Basin:	Southeast Ohio River Tribs	Drainage:	5.0 sq mi

Sample Type: Inorganic	**04-12-2016**	**04-27-2016**	**05-11-2016**	**06-07-2016**	**06-23-2016**
Ammonia (mg/L)	.064	.181	.115	.105	.433
Nitrate, nitrite (mg/L)	.22	.44	.34	.49	.84
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	.014	.037
Total Phosphorus (mg/L)	.026	.021	.036	.033	4.25
CorrectedConductance(umhos/cm)	588	1088	777	1455	1054
DissolvedOxygen(mg/L)	12.65	9.8	9.96	5.99	8.01
pH(su)	7.25	7.48	7.44	7.57	7.35
Saturation(percent)	109.2	98.1	101.4	65.1	88.1
Temperature(deg C)	8.83	15.3	16.1	19.22	19.86
UncorrectedConductance(umhos/cm)	406	887	645	1295	950

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**10.2**	Location:	RACCOON CREEK AT NORTHUP, DST. DAM
Basin:	Southeast Ohio River Tribs	Drainage:	648.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	42.6	72.9	65.3	48.7	82.1
Aluminum (ug/L)	281	371	614	457	321
Ammonia (mg/L)	< .05	.058	.072	.056	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	32	57	51	34	66
BOD5 (mg/L)	6.7	4.1	9	< 2	< 2
Bromide (ug/L)			40.5		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	30.1	44.3	38.8	31	51.9
Chloride (mg/L)	11.5	26	15.1	12.2	31.6
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	20	< 20
Conductivity (umhos/cm)	314	527	368	318	557
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	122	177	147	117	202
Iron (ug/L)	750	907	1160	1060	644
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	11.4	16	12.1	9.5	17.6
Manganese (ug/L)	159	493	161	174	779
Nickel (ug/L)	2.2	2.8	3.1	3.1	3.4
Nitrate, nitrite (mg/L)	.2	.16	.73	.28	.23
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01			< .01	
Potassium (mg/L)	2.2	3.4	4.5	3.3	4.6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.4	30.9	19	14.5	39.9
Solids, Total Dissolved (mg/L)	218	314	254	192	364
Strontium (ug/L)	161	291	209	155	354
Sulfate (mg/L)	93.2	133	99.6	74.9	149
TKN (mg/L)	.27	.27	.37	.51	.25
TOC (mg/L)	2.24	2.61	4.45	4.52	3.52
Total Phosphorus (mg/L)	.018	.023	.059	.041	.017
Total Suspended Solids (mg/L)	17	64	25	17	14
Zinc (ug/L)	15	< 10	< 10	10	18
CorrectedConductance(umhos/cm)	296	521	380	309	585
DissolvedOxygen(mg/L)	13.28	5.61	6.47	8.4	5.94
pH(su)	7.91	7.46	7.75	7.77	7.84
Saturation(percent)	146.4	67.7	77.7	104.8	71.3
Temperature(deg C)	20.07	24.71	24.58	26.63	24.45
UncorrectedConductance(umhos/cm)	268	518	377	319	579

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**50.1**	Location:	RACCOON CREEK 3 MI. SW OF WILKESVILLE @ CO. RD. 5-W
Basin:	Southeast Ohio River Tribs	Drainage:	336.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	31.8	53.4	48.1	57.8	67.4
Aluminum (ug/L)	244	< 200	247	234	< 200
Ammonia (mg/L)	.05	.056	.06	.059	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	31	40	37	36	49
Bromide (ug/L)		50.7	34.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	29	54.9	41.9	38.1	57.3
Chloride (mg/L)	10.1	17	13.5	14.7	17.7
Chlorophyll_a (ug/L)		1.1			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	306	581	408	387	610
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	123	225	171	151	232
Iron (ug/L)	806	612	1090	1300	799
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	12.4	21.4	16	13.5	21.7
Manganese (ug/L)	419	412	444	358	565
Nickel (ug/L)	4.1	3.1	3.6	3	3.3
Nitrate, nitrite (mg/L)	.16	.12	.25	.33	.13
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		< 1.4			
Potassium (mg/L)	2	3.2	3.1	3.2	4.4
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	12.3	28.9	19.2	17	39.6
Solids, Total Dissolved (mg/L)	202	430	274	246	430
Strontium (ug/L)	141	325	212	177	345
Sulfate (mg/L)	102	209	124	95.8	207
TKN (mg/L)	< .2	.3	< .2	.32	< .2
Total Phosphorus (mg/L)	.011	.022	.011	.023	< .01
Total Suspended Solids (mg/L)	7	< 5	11	10	12
Zinc (ug/L)	10	< 10	< 10	< 10	12
CorrectedConductance(umhos/cm)	301	581	425	200	640
DissolvedOxygen(mg/L)	10.64	6.22	7.01	9.26	5.43
pH(su)	7.85	7.08	8.14	7.37	7.75
Saturation(percent)	114.3	72.4	81.8	112.1	60.1
Temperature(deg C)	18.76	22.8	23.01	25.01	20.24
UncorrectedConductance(umhos/cm)	265		409	200	582

River Code:	**09-546-000**	Stream:	**STRONGS RUN**
River Mile:	**5.9**	Location:	STRONGS RUN E OF WILKESVILLE @ TWP. RD. 24
Basin:	Southeast Ohio River Tribs	Drainage:	5.9 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	91.1	133	73.9	94.3	148
Aluminum (ug/L)	< 200	204	629	< 200	< 200
Ammonia (mg/L)	.257	.096	.259	.09	.081
Arsenic (ug/L)	< 2	2.2	< 2	< 2	< 2
Barium (ug/L)	50	62	58	55	49
Bromide (ug/L)			26.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	28.4	33.4	28	32.8	36.6
Chloride (mg/L)	11.8	18.2	19.5	11.5	30.2
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	33	< 20	< 20	26
Conductivity (umhos/cm)	264	326	264	287	359
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	103	118	100	116	126
Iron (ug/L)	847	1350	1820	1580	429
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	7.7	8.5	7.3	8.4	8.5
Manganese (ug/L)	947	2040	372	450	571
Nickel (ug/L)	< 2	2	2.2	< 2	2.2
Nitrate, nitrite (mg/L)	.17	< .1	2.41	.35	< .1
Nitrite (mg/L)	.033	< .02	.07	< .02	< .02
Potassium (mg/L)	3.1	3.7	4.8	3.3	5.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	11.5	14	12.2	11.5	19.6
Solids, Total Dissolved (mg/L)	170	204	188	182	220
Strontium (ug/L)	144	163	117	150	165
Sulfate (mg/L)	28.3	15	23.9	28.8	8.5
TKN (mg/L)	.7	.66	.84	.38	.81
Total Phosphorus (mg/L)	.031	.079	.069	.019	.072
Total Suspended Solids (mg/L)	10	18	16	9	< 5
Zinc (ug/L)	< 10	< 10	13	< 10	< 10
CorrectedConductance(umhos/cm)	267	341	263	288	359
DissolvedOxygen(mg/L)	5.44	5.29	5.65	6.04	5.11
pH(su)	7.87	7.75	7.32	7.46	7.73
Saturation(percent)	63.8	60.8	65.4	71.3	58.2
Temperature(deg C)	23.35	22.19	22.59	23.67	21.7
UncorrectedConductance(umhos/cm)	258	323	251	281	336

River Code:	**09-549-000**	Stream:	**FLATLICK RUN**
River Mile:	**0.6**	Location:	FLATLICK RUN S OF WILKESVILLE @ NEWSOME RD. (CO. RD. 8)
Basin:	Southeast Ohio River Tribs	Drainage:	7.2 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	58.8	68.9	65.1	64	145
Aluminum (ug/L)	< 200	< 200	304	< 200	< 200
Ammonia (mg/L)	.125	.146	.073	.073	.245
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	35	33	48	45	84
Bromide (ug/L)			26.3		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	20.3	18.8	26.2	26.1	37.1
Chloride (mg/L)	28.4	29.7	29.9	29.4	31.3
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	21	< 20	< 20	23
Conductivity (umhos/cm)	243	227	286	273	350
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	76	68	95	94	122
Iron (ug/L)	1120	1280	1130	1060	1350
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	6.1	5	7.2	7.1	7.2
Manganese (ug/L)	618	1160	267	375	4010
Nickel (ug/L)	< 2	< 2	2	< 2	2.4
Nitrate, nitrite (mg/L)	.33	.27	.4	.24	< .1
Nitrite (mg/L)	< .02	.023	< .02	< .02	< .02
Potassium (mg/L)	2	2.4	2.8	2.6	4.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	16.8	14.5	21.4	19	18.3
Solids, Total Dissolved (mg/L)	160	154	190	164	204
Strontium (ug/L)	84	72	101	98	123
Sulfate (mg/L)	19.8	5.9	34	27.6	< 5
TKN (mg/L)	.27	.48	.42	.41	.74
Total Phosphorus (mg/L)	.025	.03	.029	.016	.033
Total Suspended Solids (mg/L)	< 5	6	10	< 5	6
Zinc (ug/L)	< 10	11	< 10	12	< 10
CorrectedConductance(umhos/cm)	259	239	286	284	347
DissolvedOxygen(mg/L)	6.79	5.59	7.47	6.79	2.29
pH(su)	7.81	7.68	7.65	7.77	7.39
Saturation(percent)	76.7	62	85.9	81	24.3
Temperature(deg C)	21.34	20.39	22.24	24.2	18.22
UncorrectedConductance(umhos/cm)	241	218	271	280	302

River Code:	**09-544-000**	Stream:	**ROBINSON RUN**
River Mile:	**0.2**	Location:	ROBINSON RUN N OF VINTON @ ST. RT. 325
Basin:	Southeast Ohio River Tribs	Drainage:	9.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	79	101	87.3	88.3	172
Aluminum (ug/L)	< 200	506	268	< 200	< 200
Ammonia (mg/L)	.091	.291	< .05	.068	.449
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	36	65	39	41	40
Bromide (ug/L)			21.5		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	24.8	26.2	30.1	29.4	40.2
Chloride (mg/L)	9	20	15.4	11.7	43.2
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	22	< 20	< 20	25
Conductivity (umhos/cm)	222	270	258	246	436
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	85	92	102	99	135
Iron (ug/L)	791	3600	950	952	893
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	5.7	6.4	6.4	6.2	8.3
Manganese (ug/L)	601	4030	242	374	9900
Nickel (ug/L)	< 2	2.4	< 2	< 2	3.1
Nitrate, nitrite (mg/L)	.25	< .1	.78	.39	.16
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.3	2.4	3.2	3.1	3.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	9.1	12.2	12.9	10.7	29.3
Solids, Total Dissolved (mg/L)	142	170	164	158	244
Strontium (ug/L)	105	108	116	114	168
Sulfate (mg/L)	21	12	24.4	22.5	< 5
TKN (mg/L)	.33	.76	.37	.42	.89
Total Phosphorus (mg/L)	.015	.038	.028	.018	.024
Total Suspended Solids (mg/L)	5	31	7	10	12
Zinc (ug/L)	< 10	18	< 10	< 10	18
CorrectedConductance(umhos/cm)	222	274	261	259	431
DissolvedOxygen(mg/L)	6.39	5.56	7.01	7.18	3.98
pH(su)	7.64	7.59	7.89	7.97	7.49
Saturation(percent)	74.4	62.3	82.6	86.6	42.3
Temperature(deg C)	22.93	20.88	23.52	24.82	18.28
UncorrectedConductance(umhos/cm)	213	252	254	259	375

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**35.6**	Location:	RACCOON CREEK AT WOODS MILL @ EAGLE RD.
Basin:	Southeast Ohio River Tribs	Drainage:	542.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	39.5	68.1	60.3	59.2	98.6
Aluminum (ug/L)	249	< 200	454	334	< 200
Ammonia (mg/L)	.051	.056	.063	.058	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	31	41	41	36	50
BOD5 (mg/L)	6.8	4.6	8.8	< 2	< 2
Bromide (ug/L)			30.3		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	32	48.6	41.9	38.5	64.7
Chloride (mg/L)	10.5	16.1	12.9	14	18
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	327	560	427	393	648
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	132	196	161	148	250
Iron (ug/L)	788	671	1150	1050	754
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	12.6	18.1	13.6	12.6	21.5
Manganese (ug/L)	282	383	273	308	603
Nickel (ug/L)	3.2	2.5	3.4	3.7	3.7
Nitrate, nitrite (mg/L)	.2	.22	.63	.34	.21
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)	< .01			< .01	
Potassium (mg/L)	2.3	3.5	3.9	3.3	5.4
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.6	31.6	22.6	16.8	45.2
Solids, Total Dissolved (mg/L)	218	360	286	258	434
Strontium (ug/L)	172	327	241	193	436
Sulfate (mg/L)	104	172	124	99.6	199
TKN (mg/L)	.24	.21	.32	.53	.21
TOC (mg/L)	2.18	2.41	3.72	3.78	3.48
Total Phosphorus (mg/L)	.02	.015	.033	.03	< .01
Total Suspended Solids (mg/L)	12	6	19	17	8
Zinc (ug/L)	15	< 10	< 10	< 10	12
CorrectedConductance(umhos/cm)	321	563	433	386	673
DissolvedOxygen(mg/L)	13.88	6.8	7.19	7.96	5.79
pH(su)	7.9	7.52	7.96	7.53	7.65
Saturation(percent)	149.9	79.1	83.5	97.4	65.2
Temperature(deg C)	19.05	22.81	22.75	25.6	21.1
UncorrectedConductance(umhos/cm)	284	539	414	390	623

River Code:	**09-546-000**	Stream:	**STRONGS RUN**
River Mile:	**0.6**	Location:	STRONGS RUN NE OF EWINGTON @ ADNEY RD.
Basin:	Southeast Ohio River Tribs	Drainage:	16.4 sq mi

Sample Type: Inorganic	**04-27-2016**	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	49	83.9	110	65.6	85.1	126
Aluminum (ug/L)	5590	< 200	< 200	977	< 200	< 200
Ammonia (mg/L)	< .05	.145	.506	.093	.068	.062
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	66	40	40	46	45	30
Bromide (ug/L)	< 20		48.7	< 20		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	18.9	27.1	28	22.9	29.7	29.3
Chloride (mg/L)	5.8	9.7	10.1	9.3	9.5	6.5
Chlorophyll_a (ug/L)			3.1			
Chromium (ug/L)	2.7	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	41	< 20	< 20	27	< 20	< 20
Conductivity (umhos/cm)	152	233	253	208	244	249
Copper, Low Level (ug/L)	3.3	< 2	< 2	2.2	< 2	< 2
Hardness, Total (mg/L)	68	95	98	81	103	101
Iron (ug/L)	5500	802	957	1930	999	490
Lead (ug/L)	3.3	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	5.1	6.6	6.7	5.7	7.1	6.7
Manganese (ug/L)	252	383	2120	138	222	800
Nickel (ug/L)	4.4	< 2	< 2	2.4	< 2	< 2
Nitrate, nitrite (mg/L)	.41	.26	.21	1.12	.39	< .1
Nitrite (mg/L)	< .02	< .02	.116	.026	< .02	< .02
Orthophosphate, dissolved (mg/L)	.016		< .01			
Pheophytin_a (ug/L)			< 1.4			
Potassium (mg/L)	3.1	2.5	4.4	4.6	3.2	5.6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	5.4	9.1	8.7	8.3	9.7	7.7
Solids, Total Dissolved (mg/L)	128	150	160	152	166	146
Strontium (ug/L)	84	123	123	96	123	119
Sulfate (mg/L)	22.3	23.1	10.5	23.6	26.9	< 5
TKN (mg/L)	.9	2.32	.85	.8	.42	.47
Total Phosphorus (mg/L)	.159	< .01	.032	.108	.026	.029
Total Suspended Solids (mg/L)	109	< 5	< 5	26	< 5	< 5
Zinc (ug/L)	16	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	153.1	229	258.1	206	252	248
DissolvedOxygen(mg/L)	8.62	7.49	4.59	6.5	6.42	4.66
pH(su)	7.18	7.75	7.15	7.7	7.74	7.57
Saturation(percent)	84.5	86.6	50.5	75.6	77.6	50.6
Temperature(deg C)	14.4	22.56	20	22.85	24.9	19.28
UncorrectedConductance(umhos/cm)		218		197	252	221

River Code:	**09-514-000**	Stream:	**DICKASON RUN**
River Mile:	**2.4**	Location:	DICKASON RUN @ KEYSTONE FURNACE RD.
Basin:	Southeast Ohio River Tribs	Drainage:	17.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	67.3	75.5	53.7	54.1	104
Aluminum (ug/L)	< 200	< 200	208	< 200	< 200
Ammonia (mg/L)	.109	.092	.067	.102	.087
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	46	71	42	46	47
Bromide (ug/L)			41.8		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	55.7	88.8	39	33.4	72.2
Chloride (mg/L)	27	30.9	35.5	37.8	25.4
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	23	< 20	22	< 20	20
Conductivity (umhos/cm)	556	902	428	385	717
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	228	392	154	126	314
Iron (ug/L)	1020	778	1250	2050	404
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	21.5	41.3	13.7	10.4	32.5
Manganese (ug/L)	1290	851	1040	899	279
Nickel (ug/L)	5	5.8	5.1	6.1	4.5
Nitrate, nitrite (mg/L)	.12	.18	.25	.19	.11
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.6	3.8	4.2	3.2	5.6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	21.4	23.9	25.1	24.2	20.4
Solids, Total Dissolved (mg/L)	414	722	278	258	540
Strontium (ug/L)	243	367	164	130	309
Sulfate (mg/L)	166	368	99.6	86.9	240
TKN (mg/L)	.34	.44	.54	.61	.55
Total Phosphorus (mg/L)	.016	.017	.026	.019	.023
Total Suspended Solids (mg/L)	9	5	7	< 5	< 5
Zinc (ug/L)	< 10	10	< 10	48	< 10
CorrectedConductance(umhos/cm)	560	889	423	397	705
DissolvedOxygen(mg/L)	6.35	5.97	6.25	5.74	5.38
pH(su)	7.82	8.07	8.1	7.37	7.57
Saturation(percent)	76.7	69	72.4	68.9	58.4
Temperature(deg C)	24.8	22.4	22.66	24.46	19.25
UncorrectedConductance(umhos/cm)	558	845	404	393	628

River Code:	**09-530-000**	Stream:	**ELK FORK**
River Mile:	**13.9**	Location:	ELK FORK NEAR MCARTHUR, UPST. PUNCHEON FORK @ GRAVEL ROAD
Basin:	Southeast Ohio River Tribs	Drainage:	14.4 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	52.7	93.3	71.7	106	111
Aluminum (ug/L)	< 200	< 200	283	< 200	< 200
Ammonia (mg/L)	.086	.075	< .05	.07	.088
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	36	48	36	55	72
Bromide (ug/L)			30.3		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	49.8	86.4	59.6	107	147
Chloride (mg/L)	13.5	18.3	10	20.8	22.8
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	446	734	498	853	1080
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	193	336	224	405	591
Iron (ug/L)	442	520	864	460	462
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	16.6	29.3	18.2	33.4	54.3
Manganese (ug/L)	378	902	375	774	878
Nickel (ug/L)	5.2	5.6	5.4	6.5	7.8
Nitrate, nitrite (mg/L)	.17	.13	.25	.2	.18
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.7	4.5	3.6	5.4	6.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	10.4	15.9	10	19.1	23.5
Solids, Total Dissolved (mg/L)	284	514	360	604	838
Strontium (ug/L)	285	464	337	565	764
Sulfate (mg/L)	135	254	158	303	440
TKN (mg/L)	< .2	.27	.22	.51	.49
Total Phosphorus (mg/L)	.012	.021	.023	.012	.018
Total Suspended Solids (mg/L)	< 5	10	6	< 5	< 5
Zinc (ug/L)	37	< 10	< 10	11	10
CorrectedConductance(umhos/cm)	428	723	526	844	1020
DissolvedOxygen(mg/L)	7.03	5.84	8.53	7.51	6.25
pH(su)	7.54	7.6	7.65	6.9	7.47
Saturation(percent)	81.3	64.3	100.6	93.7	67.8
Temperature(deg C)	22.55	19.97	23.59	26.52	19.15
UncorrectedConductance(umhos/cm)	407	653	511	868	906

River Code:	**09-534-000**	Stream:	**PUNCHEON FORK**
River Mile:	**0.3**	Location:	PUNCHEON FORK E OF MCARTHUR @ TWP. RD. 11
Basin:	Southeast Ohio River Tribs	Drainage:	9.8 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	73.5	173	103	107	188
Aluminum (ug/L)	209	< 200	210	< 200	< 200
Ammonia (mg/L)	.958	5.15	.824	1.07	4.77
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	38	35	40	41	36
Bromide (ug/L)			80		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	37.3	55.8	39.9	42.5	50.8
Chloride (mg/L)	28.9	87.2	40.4	42.5	86.9
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	24	< 20	< 20	138
Conductivity (umhos/cm)	407	810	447	522	751
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	138	208	141	154	184
Iron (ug/L)	583	624	723	669	807
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	10.8	16.7	10	11.7	13.9
Manganese (ug/L)	338	606	326	483	663
Nickel (ug/L)	4.2	4.8	3.4	3.6	3.9
Nitrate, nitrite (mg/L)	.7	.85	.61	.79	.29
Nitrite (mg/L)	.11	.249	.127	.161	.085
Potassium (mg/L)	3.1	7	4.1	4.4	7.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	23.2	81.4	32.5	35.3	90.6
Solids, Total Dissolved (mg/L)	236	464	282	296	426
Strontium (ug/L)	187	372	176	219	317
Sulfate (mg/L)	79	108	64.6	77.5	69.2
TKN (mg/L)	1.08	5	1.17	1.49	5.73
Total Phosphorus (mg/L)	.263	1.32	.316	.337	1.23
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	6
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	394	824	475	524	712
DissolvedOxygen(mg/L)	6.59	3.26	5.12	4.32	4.34
pH(su)	7.52	7.37	7.57	6.35	7.22
Saturation(percent)	74.1	36.3	59.6	51.3	47
Temperature(deg C)	21.03	20.57	22.85	23.93	19.11
UncorrectedConductance(umhos/cm)	364	754	455	513	632

River Code:	**09-530-004**	Stream:	**TRIB. TO ELK FORK (RM 11.17)**
River Mile:	**0.4**	Location:	TRIB. TO ELK FORK (11.17) E OF MCARTHUR @ CO. RD. 7
Basin:	Southeast Ohio River Tribs	Drainage:	2.4 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	78.4	117	79.4	100
Aluminum (ug/L)	404	< 200	< 200	< 200
Ammonia (mg/L)	.087	.125	.271	.09
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	33	34	36	37
Bromide (ug/L)			51.3	
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	73.2	69.7	99.7	93
Chloride (mg/L)	20.1	32	18.3	24.5
Chromium (ug/L)	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	643	683	828	814
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	285	265	393	356
Iron (ug/L)	1890	866	676	960
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	24.9	22.1	34.9	30.1
Manganese (ug/L)	1500	1930	1610	1080
Nickel (ug/L)	14.2	5.8	18.7	7
Nitrate, nitrite (mg/L)	.79	.21	2.72	.26
Nitrite (mg/L)	< .02	< .02	.094	< .02
Potassium (mg/L)	3.1	3.7	3.8	3.6
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	20.8	34	25.5	30
Solids, Total Dissolved (mg/L)	426	444	616	566
Strontium (ug/L)	282	267	377	340
Sulfate (mg/L)	215	175	369	272
TKN (mg/L)	.22	.29	.32	.3
Total Phosphorus (mg/L)	.022	.024	.015	< .01
Total Suspended Solids (mg/L)	22	8	8	< 5
Zinc (ug/L)	25	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	619	668	874	807
DissolvedOxygen(mg/L)	8.1	5.73	7.49	6.73
pH(su)	7.47	7.62	7.51	7.13
Saturation(percent)	91.5	62.9	86.5	79.7
Temperature(deg C)	21.25	19.82	22.39	23.67
UncorrectedConductance(umhos/cm)	575	602	830	787

River Code:	**09-530-000**	Stream:	**ELK FORK**
River Mile:	**8.6**	Location:	ELK FORK SW OF PRATTSVILLE @ GRAVEL ROAD DST. WOLF RUN
Basin:	Southeast Ohio River Tribs	Drainage:	44.4 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	54.1	61.2	68.4	66.5	79.8
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.113	.08	.068	.073	.062
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	34	48	35	39	47
Bromide (ug/L)			34.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	55.8	98.9	62.9	62.6	113
Chloride (mg/L)	15.8	28.7	15.1	18	45.9
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	538	959	541	576	1130
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	232	440	255	262	514
Iron (ug/L)	542	446	607	605	194
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	22.6	46.8	23.8	25.6	56.2
Manganese (ug/L)	1020	1170	685	659	512
Nickel (ug/L)	8	8.1	5.9	5.4	6.6
Nitrate, nitrite (mg/L)	.42	.51	.39	.46	.61
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	3	5	3.7	4.2	7.1
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.4	25.1	14.8	17.4	42
Solids, Total Dissolved (mg/L)	402	764	370	396	880
Strontium (ug/L)	275	518	298	288	611
Sulfate (mg/L)	182	414	195	192	445
TKN (mg/L)	.26	.27	.42	.5	.51
Total Phosphorus (mg/L)	.013	.013	.019	.014	.012
Total Suspended Solids (mg/L)	< 5	5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	524	937	535	590	1108
DissolvedOxygen(mg/L)	6.92	5.7	6.93	6.65	5.7
pH(su)	8.01	7.47	7.59	7.83	7.34
Saturation(percent)	77.8	64.4	82.7	81.6	66.8
Temperature(deg C)	21.06	21.23	24.18	25.71	23.19
UncorrectedConductance(umhos/cm)	484	869	526	598	1070

River Code:	**09-524-000**	Stream:	**MEADOW RUN**
River Mile:	**0.7**	Location:	MEADOW RUN E OF WELLSTON @ CHEATWOOD RD/T-383
Basin:	Southeast Ohio River Tribs	Drainage:	9.9 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**07-28-2016**	**08-24-2016**	**09-26-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	
Alkalinity (mg/L)	119	181	138	121	152	
Aluminum (ug/L)	209	< 200	519	1620	904	409
Ammonia (mg/L)	.213	4.18	.599	.146	.125	.098
Arsenic (ug/L)	< 2	2	< 2	2.2	2.2	2
Barium (ug/L)	24	22	36	41	34	23
Bromide (ug/L)		106	65.7			
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	47.1	47.8	54.1	44.8	58.4	53.5
Chloride (mg/L)	57.3	84.7	60.4	39.5	74.9	
Chlorophyll_a (ug/L)		1.7				
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	29	< 20	21	20
Conductivity (umhos/cm)	605	898	675	487	781	
Copper, Low Level (ug/L)	< 2	2.5	2	2.9	2.8	2
Hardness, Total (mg/L)	169	183	194	151	206	196
Iron (ug/L)	588	244	1080	3110	1590	636
Lead (ug/L)	< 2	< 2	< 2	3	3	< 2
Magnesium (mg/L)	12.5	15.4	14.3	9.4	14.7	15.2
Manganese (ug/L)	211	126	309	442	305	88
Nickel (ug/L)	3.3	7.3	5.8	5.4	7.2	4.6
Nitrate, nitrite (mg/L)	6.54	11.5	6.52	2.98	12.1	10.4
Nitrite (mg/L)	.109	.478	.202	.058	.05	
Orthophosphate, dissolved (mg/L)		1.18				
Pheophytin_a (ug/L)		1.5				
Potassium (mg/L)	10.3	19.5	12.2	6.9	17.3	19.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	56.4	92.5	66.8	36.3	87.5	106
Solids, Total Dissolved (mg/L)	384	526	424	304	484	
Strontium (ug/L)	225	268	252	187	289	371
Sulfate (mg/L)	75.7	99.5	97.7	59.8	84.4	
TKN (mg/L)	.72	4.87	1.29	1.16	1.45	1.32
Total Phosphorus (mg/L)	.929	1.3	.35	.228	.536	.95
Total Suspended Solids (mg/L)	14	< 5	28	87	60	
Zinc (ug/L)	32	18	15	22	21	15
CorrectedConductance(umhos/cm)	588	894	673	485	802	942
DissolvedOxygen(mg/L)	6.82	4.47	6	6.17	5.51	5.28
pH(su)	7.67	7.47	7.65	7.57	7.73	7.86
Saturation(percent)	79.1	49.4	69.6	72.5	62.2	58.6
Temperature(deg C)	22.64	20	22.61	23.33	21.17	20.35
UncorrectedConductance(umhos/cm)	562		642	469	743	859

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**24.6**	Location:	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32
Basin:	Southeast Ohio River Tribs	Drainage:	62.5 sq mi

Sample Type: Inorganic	**06-01-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	61.2	167	98.8	65.7	175
Aluminum (ug/L)	361	< 200	322	281	< 200
Ammonia (mg/L)	.094	.072	.097	.115	.086
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	30	42	43	34	36
Bromide (ug/L)		41.1	29.2		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	25	42.8	41.9	28.7	43.2
Chloride (mg/L)	12.7	32.3	21.5	13.3	37.8
Chlorophyll_a (ug/L)		7.1			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	261	550	409	283	574
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	97	168	156	106	166
Iron (ug/L)	1110	641	1180	1120	478
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	8.4	14.8	12.4	8.4	14.1
Manganese (ug/L)	376	408	599	492	341
Nickel (ug/L)	2.7	2.7	3.7	3.5	2.9
Nitrate, nitrite (mg/L)	.28	.63	.68	.57	.75
Nitrite (mg/L)	< .02	< .02	.022	.022	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		4			
Potassium (mg/L)	2.9	6	5	3.2	7.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	14.8	41.5	26.6	15.1	50.3
Solids, Total Dissolved (mg/L)	156	320	254	186	356
Strontium (ug/L)	177	466	280	163	438
Sulfate (mg/L)	51.9	76.9	76.9	59.1	71.5
TKN (mg/L)	.34	.52	.36	.58	.32
Total Phosphorus (mg/L)	.036	.037	.036	.049	.033
Total Suspended Solids (mg/L)	17	7	18	19	< 5
Zinc (ug/L)	19	< 10	10	< 10	< 10
CorrectedConductance(umhos/cm)	282	562	405	299	556
DissolvedOxygen(mg/L)	5.94	5.48	5.8	5.22	5.37
pH(su)	7.42	7.31	7.42	7.61	7.56
Saturation(percent)	72	62.9	66.4	63.8	59.6
Temperature(deg C)	25.05	22.1	21.97	25.45	20.43
UncorrectedConductance(umhos/cm)	282		382	302	508

River Code:	**09-524-000**	Stream:	**MEADOW RUN**
River Mile:	**2.2**	Location:	MEADOW RUN @ OLD/NEW ST. RT. 327, DST.TRIBS (RM 2.18)
Basin:	Southeast Ohio River Tribs	Drainage:	8.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**07-28-2016**	**08-24-2016**	**09-26-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	179	272	144	105	293	366
Aluminum (ug/L)	< 200	266	341	2740	529	358
Ammonia (mg/L)	.145	.158	.103	.121	.086	.084
Arsenic (ug/L)	< 2	< 2	< 2	2.1	< 2	< 2
Barium (ug/L)	27	30	39	49	33	24
Bromide (ug/L)			40.3			
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	46	45.6	54.7	33	52.1	49.3
Chloride (mg/L)	67.1	89.7	51.5	31.7	91.8	112
Chromium (ug/L)	< 2	< 2	< 2	2.3	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	44	22	21
Conductivity (umhos/cm)	769	1050	654	391	998	1250
Copper, Low Level (ug/L)	< 2	< 2	< 2	4.5	2.7	2.2
Hardness, Total (mg/L)	174	181	196	115	196	191
Iron (ug/L)	726	972	949	4740	1370	819
Lead (ug/L)	< 2	< 2	< 2	4.5	< 2	< 2
Magnesium (mg/L)	14.4	16.4	14.5	7.8	15.9	16.4
Manganese (ug/L)	401	540	603	632	412	138
Nickel (ug/L)	4.4	4.6	6.8	6.9	5.2	4.7
Nitrate, nitrite (mg/L)	7.47	9.89	1.09	2.01	6.35	13
Nitrite (mg/L)	.198	.26	.037	.029	.037	.058
Potassium (mg/L)	14.5	20.3	9.6	7.3	22.8	29.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	89.5	132	65.4	31.3	157	186
Solids, Total Dissolved (mg/L)	466	622	412	252	608	784
Strontium (ug/L)	337	445	275	149	436	513
Sulfate (mg/L)	88.3	93.4	109	46.2	93.5	90.7
TKN (mg/L)	.94	< .2	.46	1.47	1.14	.93
Total Phosphorus (mg/L)	.142	.096	.041	.268	.085	.248
Total Suspended Solids (mg/L)	8	14	13	162	33	20
Zinc (ug/L)	< 10	< 10	< 10	26	16	< 10
CorrectedConductance(umhos/cm)	751	1024	646	390	1037	1271
DissolvedOxygen(mg/L)	7.41	6.91	6.47	5.61	7.49	5.52
pH(su)	7.85	7.8	7.63	7.63	7.78	7.73
Saturation(percent)	88.6	77.4	74.2	65.8	85.1	60.3
Temperature(deg C)	24.27	20.78	22.07	23.21	21.54	19.51
UncorrectedConductance(umhos/cm)	741	942	610	377	969	1138

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**99.6**	Location:	RACCOON CREEK W OF ZALESKI @ ST. RT. 677
Basin:	Southeast Ohio River Tribs	Drainage:	98.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	21.1	31.1	23.6	41.1	46.5
Aluminum (ug/L)	< 200	< 200	305	276	372
Ammonia (mg/L)	.059	.068	.072	.075	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	31	41	41	33	34
Bromide (ug/L)			35.1		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	26.8	48.5	45.7	52.6	64.3
Chloride (mg/L)	9.5	16.1	11.8	13.3	18.2
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	304	520	460	557	649
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	122	223	210	240	307
Iron (ug/L)	440	500	745	548	393
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	13.4	24.8	23.2	26.4	35.6
Manganese (ug/L)	1080	1280	1700	1070	2910
Nickel (ug/L)	11.8	10.4	14.1	9.6	17.7
Nitrate, nitrite (mg/L)	.13	.19	.15	.23	.12
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	3	3.2	3.5	4.8
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.1	12.9	10.9	11.8	16.7
Solids, Total Dissolved (mg/L)	232	386	332	396	472
Strontium (ug/L)	104	188	165	199	253
Sulfate (mg/L)	111	189	178	194	259
TKN (mg/L)	.21	< .2	.2	.31	< .2
Total Phosphorus (mg/L)	.01	.011	.016	.01	.022
Total Suspended Solids (mg/L)	5	< 5	6	< 5	< 5
Zinc (ug/L)	13	< 10	15	24	20
CorrectedConductance(umhos/cm)	320	520	464	547	722
DissolvedOxygen(mg/L)	8.53	6.81	6.6	5.99	5.1
pH(su)	7.35	7.66	7.63	7.18	7.7
Saturation(percent)	91	76.8	75.5	72	59.2
Temperature(deg C)	18.41	21.21	21.91	24.54	22.66
UncorrectedConductance(umhos/cm)	280	482	436	542	689

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**92.3**	Location:	RACCOON CREEK DST. SANDY RUN (LAKE HOPE) @ CO. RD. 3
Basin:	Southeast Ohio River Tribs	Drainage:	134.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	21.6	34	29.7	36	57.3
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.064	.103	.081	.086	.077
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	32	42	36	35	39
Bromide (ug/L)			35.8		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	24	38.2	32.3	33.5	40.2
Chloride (mg/L)	9.9	16.9	13.6	15.2	17.7
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	281	443	345	398	407
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	110	179	145	154	186
Iron (ug/L)	475	625	766	782	1010
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	12.1	20.2	15.7	17.2	20.7
Manganese (ug/L)	925	945	812	609	1360
Nickel (ug/L)	8.6	4.6	5	3.7	3.8
Nitrate, nitrite (mg/L)	.12	.19	.16	.26	.14
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.7	2.5	2.6	3.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.3	12.9	10.8	11.8	15.4
Solids, Total Dissolved (mg/L)	220	320	230	282	304
Strontium (ug/L)	98	162	126	141	175
Sulfate (mg/L)	97.4	142	116	119	115
TKN (mg/L)	< .2	.27	.43	.33	.25
Total Phosphorus (mg/L)	.018	.02	.011	< .01	< .01
Total Suspended Solids (mg/L)	5	5	< 5	< 5	6
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	294	442	353	398	430
DissolvedOxygen(mg/L)	8.29	6.05	6.63	5.21	4.62
pH(su)	7.37	7.56	7.71	7.17	7.74
Saturation(percent)	88.4	70.4	75.7	62.8	52
Temperature(deg C)	18.45	22.84	21.87	24.79	21.04
UncorrectedConductance(umhos/cm)	257	424	332	397	397

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**84.1**	Location:	RACCOON CREEK NEAR KNOX, UPST ONION CREEK @ ST. RT. 356
Basin:	Southeast Ohio River Tribs	Drainage:	183.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	25.1	36.7	32.2	39.3	54.6
Aluminum (ug/L)	< 200	< 200	202	< 200	< 200
Ammonia (mg/L)	.058	.078	.085	.08	.052
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	29	38	26	35	39
Bromide (ug/L)			38.6		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	22.8	34.6	22.6	32.8	39.8
Chloride (mg/L)	8.7	15.2	12.8	12.6	14.2
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	265	395	342	361	393
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	99	151	95	139	171
Iron (ug/L)	533	589	735	774	529
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	10.3	15.6	9.3	13.8	17.3
Manganese (ug/L)	682	630	355	429	815
Nickel (ug/L)	6.2	2.7	3.1	2.7	2.7
Nitrate, nitrite (mg/L)	.12	.18	.2	.27	.12
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.4	< 2	2.6	3.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	7.8	12.9	7.7	11.8	14.6
Solids, Total Dissolved (mg/L)	200	280	248	242	268
Strontium (ug/L)	96	156	93	141	177
Sulfate (mg/L)	88	121	113	117	112
TKN (mg/L)	.24	.27	.26	.33	< .2
Total Phosphorus (mg/L)	.013	.015	.012	< .01	< .01
Total Suspended Solids (mg/L)	10	< 5	8	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	276	390	354	368	410
DissolvedOxygen(mg/L)	8.25	5.39	6.65	5.22	5.39
pH(su)	7.75	7.51	7.98	7.83	7.84
Saturation(percent)	87.3	62.5	76.9	62.4	60.4
Temperature(deg C)	18.02	22.63	22.55	24.29	20.84
UncorrectedConductance(umhos/cm)	239	373	337	363	377

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**63.8**	Location:	RACCOON CREEK 0.3 MI. UPST. ZINNS RUN @ CO. RD. 28
Basin:	Southeast Ohio River Tribs	Drainage:	296.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	31.2	49.1	51	52.2	62.6
Aluminum (ug/L)	229	< 200	208	244	< 200
Ammonia (mg/L)	< .05	.059	.061	.059	.054
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	30	33	38	33	39
Bromide (ug/L)		48	40.3		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	25.5	31.4	38.2	29.2	37.8
Chloride (mg/L)	9.7	16.8	15.5	11.9	15.9
Chlorophyll_a (ug/L)		2			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	272	359	367	308	373
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	110	136	160	118	162
Iron (ug/L)	649	572	700	1050	710
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	11.2	14	15.8	10.9	16.3
Manganese (ug/L)	396	385	400	372	907
Nickel (ug/L)	4.1	2.5	3.3	2.6	2.9
Nitrate, nitrite (mg/L)	.17	.13	.19	.27	.13
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		< 1.4			
Potassium (mg/L)	< 2	2.2	2.9	2.7	3.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	9.1	12.7	13.6	10.6	15.1
Solids, Total Dissolved (mg/L)	182	218	242	198	246
Strontium (ug/L)	113	146	166	121	181
Sulfate (mg/L)	85.4	95.7	110	71.4	101
TKN (mg/L)	< .2	.24	.22	.36	< .2
Total Phosphorus (mg/L)	.011	.015	.012	.021	< .01
Total Suspended Solids (mg/L)	5	5	9	9	< 5
Zinc (ug/L)	11	< 10	< 10	< 10	19
CorrectedConductance(umhos/cm)	269	362	382	275	404
DissolvedOxygen(mg/L)	14.95	5.95	6.41	8.5	5.03
pH(su)	7.85	7.22	7.97	7.46	7.51
Saturation(percent)	160.6	67.9	74.2	102.4	58.7
Temperature(deg C)	18.79	21.9	22.63	24.76	23
UncorrectedConductance(umhos/cm)	237		365	273	389

River Code:	**09-575-000**	Stream:	**WEST BRANCH RACCOON CREEK**
River Mile:	**5.7**	Location:	W. BR. RACCOON CREEK @ ILESBORO-CEDAR FALLS RD
Basin:	Southeast Ohio River Tribs	Drainage:	3.8 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	21.1	28.5	23.3	26.6	63.6
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	< .05	< .05	< .05	< .05	.05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	33	51	39	52	43
Bromide (ug/L)			73.4		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	26	32.5	32.4	43.2	42.5
Chloride (mg/L)	12.7	16	16	16.7	17.6
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	294	360	338	456	382
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	115	143	141	183	173
Iron (ug/L)	73	97	75	82	185
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	12.2	14.9	14.7	18.2	16.2
Manganese (ug/L)	215	605	181	428	1730
Nickel (ug/L)	5.3	3.9	2.8	4	5.8
Nitrate, nitrite (mg/L)	.14	.12	.27	.17	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	2.2	< 2	2.2	5.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.7	10.3	9.5	10.7	11.9
Solids, Total Dissolved (mg/L)	182	264	238	308	258
Strontium (ug/L)	104	136	125	160	175
Sulfate (mg/L)	93.6	111	111	150	105
TKN (mg/L)	< .2	< .2	< .2	.21	.25
Total Phosphorus (mg/L)	.012	< .01	< .01	< .01	.022
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	286	357	365	449	370
DissolvedOxygen(mg/L)	8.35	5.37	9.14	6.39	4.06
pH(su)	7.43	6.98	7.68	7.31	8.77
Saturation(percent)	92.9	57.3	104.6	75.8	41.9
Temperature(deg C)	20.55	18.43	22	23.82	16.8
UncorrectedConductance(umhos/cm)	262	312	344	439	312

River Code:	**09-574-000**	Stream:	**EAST BRANCH RACCOON CREEK**
River Mile:	**6.6**	Location:	E. BR. RACCOON CREEK NE OF COONVILLE @ SANNER RD.
Basin:	Southeast Ohio River Tribs	Drainage:	3.2 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	19.8	26	17.5	7.2	8.7
Alkalinity (mg/L)	< 5	< 5	< 5	< 5	< 5
Aluminum (ug/L)	3890	4580	3310	965	1250
Ammonia (mg/L)	.075	.076	.061	.191	.097
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	25	33	30	37	34
Bromide (ug/L)			38.4		
Cadmium (ug/L)	.44	.6	.42	.28	.48
Calcium (mg/L)	101	136	116	114	130
Chloride (mg/L)	12.7	16.4	15.9	18.9	22.4
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	833	1070	916	937	959
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	394	537	453	439	499
Iron (ug/L)	333	161	307	477	196
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	34.4	47.9	39.7	37.5	42.3
Manganese (ug/L)	4910	6890	6440	8450	7190
Nickel (ug/L)	77.3	98.4	76.3	76.3	74.1
Nitrate, nitrite (mg/L)	.13	.13	.18	.16	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.3	3.6	2.8	4.8	5.1
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	9	11.5	10.8	11.9	15.8
Solids, Total Dissolved (mg/L)	630	894	760	756	776
Strontium (ug/L)	207	281	231	236	282
Sulfate (mg/L)	422	548	460	450	472
TKN (mg/L)	< .2	< .2	.22	.46	.2
Total Phosphorus (mg/L)	< .01	< .01	< .01	.01	.016
Total Suspended Solids (mg/L)	9	< 10	7	< 5	< 5
Zinc (ug/L)	136	152	132	89	92
CorrectedConductance(umhos/cm)	799	1051	962	939	908
DissolvedOxygen(mg/L)	8.69	8.21	8.24	6.47	7.96
pH(su)	5.57	6.71	6.16	7.99	6.82
Saturation(percent)	98.8	87.6	95.9	73.8	88.4
Temperature(deg C)	21.61	18.34	22.77	21.78	20.31
UncorrectedConductance(umhos/cm)	747	917	921	882	826

River Code:	**09-510-000**	Stream:	**LITTLE RACCOON CREEK**
River Mile:	**33.0**	Location:	L. RACCOON CREEK DST. LAKE RUPERT @ ST. RT. 93
Basin:	Southeast Ohio River Tribs	Drainage:	25.0 sq mi

Sample Type: Inorganic	**04-12-2016**	**04-27-2016**	**05-11-2016**	**06-07-2016**	**06-23-2016**
Ammonia (mg/L)	< .05	< .05	< .05	.058	.257
Nitrate, nitrite (mg/L)	.12	< .1	< .1	< .1	.38
Orthophosphate, dissolved (mg/L)	< .01	< .01	< .01	< .01	.033
Total Phosphorus (mg/L)	.012	.023	.011	.019	.985
CorrectedConductance(umhos/cm)	149	147	148	164	119
DissolvedOxygen(mg/L)	12.07	9.85	9.69	6.42	7.14
pH(su)	7.54	7.71	7.75	7.88	7.5
Saturation(percent)	108.6	102.3	101.7	74	78.2
Temperature(deg C)	10.63	17.16	17.67	22.38	19.8
UncorrectedConductance(umhos/cm)	108	125	128	156	107

River Code:	**09-575-000**	Stream:	**WEST BRANCH RACCOON CREEK**
River Mile:	**0.2**	Location:	W. BR. RACCOON CREEK NEAR MOUTH @ ST. RT. 328
Basin:	Southeast Ohio River Tribs	Drainage:	22.7 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	29.6	39.1	31.7	48.6	84.6
Aluminum (ug/L)	< 200	< 200	< 200	511	< 200
Ammonia (mg/L)	.065	.088	.066	.086	.187
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	34	34	37	29	39
Bromide (ug/L)		44.2	44.5		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	23.5	30.8	35.8	28.1	43.4
Chloride (mg/L)	10.7	14.2	14.2	11.5	37.4
Chlorophyll_a (ug/L)		3.7			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	136
Conductivity (umhos/cm)	275	341	398	306	454
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	106	134	161	119	177
Iron (ug/L)	877	743	447	1260	746
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	11.4	13.9	17.4	11.8	16.6
Manganese (ug/L)	1440	1800	2700	985	1870
Nickel (ug/L)	12.3	8.2	15.7	5.3	4.1
Nitrate, nitrite (mg/L)	.1	.12	.13	.23	.19
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		1.6			
Potassium (mg/L)	< 2	2.5	2.6	3.5	5.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.5	10	10.7	8.1	25.1
Solids, Total Dissolved (mg/L)	168	232	290	214	286
Strontium (ug/L)	100	121	134	109	188
Sulfate (mg/L)	80.7	102	127	76.2	83.6
TKN (mg/L)	< .2	< .2	< .2	.66	.65
Total Phosphorus (mg/L)	.025	.019	< .01	.035	.031
Total Suspended Solids (mg/L)	< 5	5	< 5	< 5	10
Zinc (ug/L)	19	< 10	< 10	14	< 10
CorrectedConductance(umhos/cm)	268		419	314	428
DissolvedOxygen(mg/L)	7.6	4.65	6.64	7.61	4.22
pH(su)	7.29	6.84	6.78	7.03	7.12
Saturation(percent)	86.9	52.2	77.7	93.6	47.5
Temperature(deg C)	21.96	21.1	23.16	25.85	21.13
UncorrectedConductance(umhos/cm)	252	342.1	405	319	396

River Code:	**09-500-000**	Stream:	**RACCOON CREEK**
River Mile:	**98.3**	Location:	RACCOON CREEKSW OF ZALESKI @ FOREST ROAD #3
Basin:	Southeast Ohio River Tribs	Drainage:	100.0 sq mi

Sample Type: Inorganic	**05-26-2016**	**06-22-2016**	**07-07-2016**	**08-03-2016**	**09-14-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	21.4	31.3	26.2	43	45.9
Aluminum (ug/L)	< 200	< 200	216	< 200	< 200
Ammonia (mg/L)	.064	.103	.081	.07	.063
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	31	43	42	28	32
Bromide (ug/L)			36.9		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	27.1	47.8	48.8	45.5	54.7
Chloride (mg/L)	9.5	16.1	13.3	13.8	18.6
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	311	506	465	492	561
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	124	219	222	208	257
Iron (ug/L)	453	471	613	317	345
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	13.8	24.3	24.2	22.9	29.2
Manganese (ug/L)	1080	1210	1570	674	767
Nickel (ug/L)	11.4	8.3	12.7	6.2	4.3
Nitrate, nitrite (mg/L)	.14	.17	.18	.14	.14
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	3.1	3.3	3.1	4.5
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	8.2	12.9	12	11.4	15.8
Solids, Total Dissolved (mg/L)	244	388	364	344	392
Strontium (ug/L)	106	185	175	175	219
Sulfate (mg/L)	111	186	188	165	202
TKN (mg/L)	< .2	< .2	< .2	.36	.21
Total Phosphorus (mg/L)	< .01	< .01	.011	< .01	< .01
Total Suspended Solids (mg/L)	7	< 5	5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	323	510	483	490	626
DissolvedOxygen(mg/L)	8.95	7.37	6.29	4.84	5.87
pH(su)	7.25	7.22	7.58	6.83	7.04
Saturation(percent)	94	83.8	72.1	58.1	67.7
Temperature(deg C)	17.7	21.67	22.01	24.5	22.38
UncorrectedConductance(umhos/cm)	278	478	456	485	595

River Code:	**09-561-000**	Stream:	**ONION CREEK**
River Mile:	**1.4**	Location:	ONION CREEK SE OF KNOX @ CO. RD. 4
Basin:	Southeast Ohio River Tribs	Drainage:	8.3 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	94.7	122	102	110	157
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.124	.134	.07	.137	.133
Arsenic (ug/L)	< 2	< 2	< 2	< 2	2.7
Barium (ug/L)	48	48	49	53	56
Bromide (ug/L)			33.5		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	33.4	39.4	34.9	37.1	44.5
Chloride (mg/L)	11.1	16.5	15	14.8	16
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	134
Conductivity (umhos/cm)	288	341	301	327	337
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	118	138	123	129	152
Iron (ug/L)	692	354	633	740	1180
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	8.5	9.7	8.7	8.8	10
Manganese (ug/L)	487	752	329	490	1970
Nickel (ug/L)	< 2	< 2	< 2	< 2	2.1
Nitrate, nitrite (mg/L)	.13	< .1	.43	.22	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.6	3.6	3.4	4.2	5.6
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	10.7	14.1	12.1	12.6	13.8
Solids, Total Dissolved (mg/L)	158	204	186	184	208
Strontium (ug/L)	130	151	131	138	161
Sulfate (mg/L)	35.5	29.5	33.2	30.5	9.5
TKN (mg/L)	.26	.36	.22	.65	.64
Total Phosphorus (mg/L)	.015	.026	.02	.026	.053
Total Suspended Solids (mg/L)	< 5	< 5	7	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	279	342	322	327	318
DissolvedOxygen(mg/L)	6.12	5.23	7.49	5.61	4
pH(su)	7.74	7.23	7.76	7.31	7.77
Saturation(percent)	67.1	59.2	83.3	65.2	43.4
Temperature(deg C)	19.81	21.38	20.53	22.82	19.22
UncorrectedConductance(umhos/cm)	251	319	294	313	283

River Code:	**09-553-000**	Stream:	**PIERCE RUN**
River Mile:	**1.7**	Location:	PIERCE RUN AT RADCLIFF @ TWP. RD. 2
Basin:	Southeast Ohio River Tribs	Drainage:	9.5 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	70.7	65.1	78.1	65.9	65.3
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.268	.137	.203	.164	.08
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	30	34	33	35	38
Bromide (ug/L)		50.9	41.9		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	171	233	186	263	292
Chloride (mg/L)	14.6	15.3	15.9	17.3	13.3
Chlorophyll_a (ug/L)		.9			
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	1480	1790	1440	1600	2350
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	699	916	747	962	1160
Iron (ug/L)	479	468	585	949	1170
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	66.1	81.1	68.5	74.2	105
Manganese (ug/L)	1570	1240	1440	1410	921
Nickel (ug/L)	19.6	16.4	17.2	15.7	14.6
Nitrate, nitrite (mg/L)	.39	.43	.41	.59	.75
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Orthophosphate, dissolved (mg/L)		< .01			
Pheophytin_a (ug/L)		< 1.4			
Potassium (mg/L)	8.4	10.3	9.2	10	14
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	79.2	98	82.3	99.1	153
Solids, Total Dissolved (mg/L)	1200	1510	1210	1360	2200
Strontium (ug/L)	1210	1440	1230	1350	1940
Sulfate (mg/L)	738	991	791	843	1400
TKN (mg/L)	.35	.4	.48	.44	.29
Total Phosphorus (mg/L)	< .01	.02	< .01	< .01	.297
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	1431	1813	1428	1644	2335
DissolvedOxygen(mg/L)	7.39		6.29	6.74	7.07
pH(su)	7.7	7.3	7.59	7.56	7.3
Saturation(percent)	83.8		75.3	83.1	80.4
Temperature(deg C)	21.36	21	24.17	25.75	21.35
UncorrectedConductance(umhos/cm)	1331		1405	1667	2173

River Code:	**09-565-000**	Stream:	**COAL RUN**
River Mile:	**0.1**	Location:	COAL RUN SE OF MINERAL @ ST. RT. 681
Basin:	Southeast Ohio River Tribs	Drainage:	0.8 sq mi

Sample Type: Inorganic	**05-25-2016**	**07-05-2016**	**07-27-2016**
Acidity (mg/L)	< 5	< 5	< 5
Alkalinity (mg/L)	62	71.6	76.3
Aluminum (ug/L)	< 200	204	200
Ammonia (mg/L)	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	27	34	29
Cadmium (ug/L)	< .2	< .2	< .2
Calcium (mg/L)	21.7	26	23.4
Chloride (mg/L)	< 5	< 5	< 5
Chromium (ug/L)	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20
Conductivity (umhos/cm)	181	195	209
Copper, Low Level (ug/L)	< 2	< 2	< 2
Hardness, Total (mg/L)	79	92	83
Iron (ug/L)	155	357	389
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	6.1	6.6	5.9
Manganese (ug/L)	178	496	330
Nickel (ug/L)	< 2	< 2	< 2
Nitrate, nitrite (mg/L)	< .1	< .1	< .1
Nitrite (mg/L)	< .02	< .02	< .02
Potassium (mg/L)	< 2	< 2	2
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	< 5	5.2	< 5
Solids, Total Dissolved (mg/L)	128	124	132
Strontium (ug/L)	98	110	99
Sulfate (mg/L)	27.9	25.7	20.6
TKN (mg/L)	< .2	.22	.81
Total Phosphorus (mg/L)	.01	.02	.021
Total Suspended Solids (mg/L)	< 5	8	< 5
Zinc (ug/L)	< 10	39	< 10
CorrectedConductance(umhos/cm)	148	203	211
DissolvedOxygen(mg/L)	9.9	6.91	6.86
pH(su)	7.51	7.54	7.56
Saturation(percent)	101.2	77.2	79
Temperature(deg C)	16.41	20.8	22.3
UncorrectedConductance(umhos/cm)	124	186	200

River Code:	**09-557-000**	Stream:	**FLAT RUN**
River Mile:	**1.6**	Location:	FLAT RUN SE OF BOLINS MILLS @ U.S. RT. 50
Basin:	Southeast Ohio River Tribs	Drainage:	4.8 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	150	158	140	138
Aluminum (ug/L)	246	< 200	< 200	< 200
Ammonia (mg/L)	.158	.087	.071	.08
Arsenic (ug/L)	< 2	< 2	< 2	< 2
Barium (ug/L)	54	58	65	57
Bromide (ug/L)			51.8	
Cadmium (ug/L)	< .2	< .2	< .2	< .2
Calcium (mg/L)	46.5	49.3	54.2	50
Chloride (mg/L)	21	27.9	31.1	23.3
Chromium (ug/L)	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	21	< 20	< 20
Conductivity (umhos/cm)	449	522	553	455
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	181	205	219	185
Iron (ug/L)	1450	1400	1350	1220
Lead (ug/L)	< 2	< 2	< 2	< 2
Magnesium (mg/L)	15.7	19.9	20.2	14.7
Manganese (ug/L)	769	640	377	387
Nickel (ug/L)	2.1	< 2	2.1	< 2
Nitrate, nitrite (mg/L)	.24	.21	.39	.33
Nitrite (mg/L)	.028	< .02	< .02	< .02
Potassium (mg/L)	2.7	4	3.5	3.2
Selenium (ug/L)	< 2	< 2	< 2	< 2
Sodium (mg/L)	22.3	30.7	28.3	21.3
Solids, Total Dissolved (mg/L)	260	322	362	268
Strontium (ug/L)	222	268	271	211
Sulfate (mg/L)	56.7	75.6	107	56.5
TKN (mg/L)	.37	.48	.45	.4
Total Phosphorus (mg/L)	.027	.045	.051	.04
Total Suspended Solids (mg/L)	13	10	9	7
Zinc (ug/L)	< 10	< 10	< 10	10
CorrectedConductance(umhos/cm)	439	519	646	446
DissolvedOxygen(mg/L)	6.04	7.11	6.46	4.35
pH(su)	7.75	7.43	7.88	7.62
Saturation(percent)	66.9	80.5	73	51.2
Temperature(deg C)	20.32	21.41	21.29	23.37
UncorrectedConductance(umhos/cm)	400	483	600	432

River Code:	**09-552-000**	Stream:	**ROCKCAMP RUN**
River Mile:	**0.1**	Location:	ROCKCAMP RUN NEAR HAWKS @ OLD RR NEAR MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	2.8 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	5.7
Alkalinity (mg/L)	396	399	350	303	395
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.144	.128	.09	.119	.13
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	18	19	29	28	20
Bromide (ug/L)			53.6		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	329	330	307	328	308
Chloride (mg/L)	< 5	< 5	5.1	5.8	5.5
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	3360	3640	2760	2460	3200
Copper, Low Level (ug/L)	3.1	4.4	3.7	3.1	3.6
Hardness, Total (mg/L)	1320	1320	1170	1190	1170
Iron (ug/L)	840	899	743	772	693
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	120	120	97.5	89	97.8
Manganese (ug/L)	1990	2270	2040	2150	1970
Nickel (ug/L)	7.7	5.8	7.2	8.5	8.6
Nitrate, nitrite (mg/L)	.37	.36	.46	.59	.42
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	15.8	15.5	14.7	12.6	13.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	499	492	406	360	430
Solids, Total Dissolved (mg/L)	2860	3080	2360	2080	2840
Strontium (ug/L)	2860	2700	2340	2010	2360
Sulfate (mg/L)	1780	1450	1500	1230	1770
TKN (mg/L)	.34	.36	.35	.57	.34
Total Phosphorus (mg/L)	< .01	.011	.015	.01	.034
Total Suspended Solids (mg/L)	< 5	< 5	< 5	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	3310	3587	2687	2552	3236
DissolvedOxygen(mg/L)	6.19	7.1	5.94	6.55	7.22
pH(su)	7.31	7.45	7.58	7.51	7.33
Saturation(percent)	71.1	79.4	73.8	82.5	82.8
Temperature(deg C)	21.71	20.29	26.08	26.85	21.63
UncorrectedConductance(umhos/cm)	3102	3264	2742	2642	3028

River Code:	**09-539-000**	Stream:	**INDIAN CREEK**
River Mile:	**1.5**	Location:	INDIAN CREEK DST. RIO GRANDE WWTP, UPST. L. INDIAN CREEK
Basin:	Southeast Ohio River Tribs	Drainage:	10.4 sq mi

Sample Type: Inorganic	**06-22-2016**	**08-02-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	5.1
Alkalinity (mg/L)	86.4	91.3	31.2
Aluminum (ug/L)	220	< 200	< 200
Ammonia (mg/L)	.079	.067	.108
Arsenic (ug/L)	< 2	< 2	< 2
Barium (ug/L)	50	50	28
Bromide (ug/L)	62.3		
Cadmium (ug/L)	< .2	< .2	< .2
Calcium (mg/L)	45.1	37.8	74.9
Chloride (mg/L)	82.7	45.4	151
Chlorophyll_a (ug/L)	5.4		
Chromium (ug/L)	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	23
Conductivity (umhos/cm)	636	460	1150
Copper, Low Level (ug/L)	5.7	3.9	15.7
Hardness, Total (mg/L)	155	130	248
Iron (ug/L)	812	643	148
Lead (ug/L)	< 2	< 2	< 2
Magnesium (mg/L)	10.3	8.7	14.7
Manganese (ug/L)	560	296	97
Nickel (ug/L)	3.1	2	7
Nitrate, nitrite (mg/L)	14	8.36	50
Nitrite (mg/L)	.02	< .02	.083
Orthophosphate, dissolved (mg/L)	2		
Pheophytin_a (ug/L)	4.4		
Potassium (mg/L)	7.9	5.8	18.5
Selenium (ug/L)	< 2	< 2	< 2
Sodium (mg/L)	54.1	33.6	115
Solids, Total Dissolved (mg/L)	426	268	864
Strontium (ug/L)	155	133	189
Sulfate (mg/L)	45.3	33.2	90.2
TKN (mg/L)	.44	.4	.91
Total Phosphorus (mg/L)	2.1	.893	7.45
Total Suspended Solids (mg/L)	5	< 5	< 5
Zinc (ug/L)	25	< 10	39
CorrectedConductance(umhos/cm)	637	450	1180
DissolvedOxygen(mg/L)	5.47	5.97	4.52
pH(su)	7.19	7.49	6.85
Saturation(percent)	62.5	70.7	50.6
Temperature(deg C)	21.8	23.82	20.76
UncorrectedConductance(umhos/cm)		440	1084

River Code:	**09-551-000**	Stream:	**INDIANCAMP RUN**
River Mile:	**0.3**	Location:	INDIANCAMP RUN SW OF CLARION, ADJ. CO. RD. 26
Basin:	Southeast Ohio River Tribs	Drainage:	2.1 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	210	180	139	131	182
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.054	.056	< .05	< .05	< .05
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	53	70	58	50	61
Bromide (ug/L)			30.1		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	150	141	104	91.5	128
Chloride (mg/L)	24.9	28	34.1	29.5	26.1
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	< 20
Conductivity (umhos/cm)	1330	1340	966	857	1150
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	579	540	396	351	477
Iron (ug/L)	259	313	164	272	115
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	49.7	45.6	33.2	29.8	38.2
Manganese (ug/L)	245	403	310	349	322
Nickel (ug/L)	4.2	3.4	4.3	3.9	4.3
Nitrate, nitrite (mg/L)	< .1	< .1	.13	.18	< .1
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	7.2	6.3	5.7	5.7	6.3
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	98.6	93.2	70.1	61	96.2
Solids, Total Dissolved (mg/L)	992	1040	698	608	880
Strontium (ug/L)	1100	906	661	587	788
Sulfate (mg/L)	489	531	325	261	431
TKN (mg/L)	< .2	.47	< .2	.23	.23
Total Phosphorus (mg/L)	.01	< .01	< .01	< .01	< .01
Total Suspended Solids (mg/L)	< 5	8	< 5	< 5	< 5
Zinc (ug/L)	< 10	28	< 10	< 10	11
CorrectedConductance(umhos/cm)	1325	1341	930	871	1134
DissolvedOxygen(mg/L)	6.42	5.79	6.26	7.3	5.92
pH(su)	7.47	7.18	7.32	7.73	7.2
Saturation(percent)	70.8	61.2	72	83.4	65.9
Temperature(deg C)	19.92	17.83	22.2	21.87	20.45
UncorrectedConductance(umhos/cm)	1196	1157	880	819	1035

River Code:	**09-573-000**	Stream:	**TWOMILE RUN**
River Mile:	**0.2**	Location:	TWOMILE RUN 4.8 MI. N OF ZALESKI @ ROAD NEAR MOUTH
Basin:	Southeast Ohio River Tribs	Drainage:	4.9 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	35.6	43.4	50.8	54.1	61.9
Aluminum (ug/L)	< 200	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.081	.081	.059	.065	.055
Arsenic (ug/L)	< 2	< 2	< 2	< 2	< 2
Barium (ug/L)	41	51	52	53	44
Bromide (ug/L)			34.6		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	28.3	42.3	52.4	51.4	43.5
Chloride (mg/L)	5.7	6.6	< 5	6.2	6.8
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	< 20	< 20	< 20	135
Conductivity (umhos/cm)	315	452	535	531	424
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	137	208	260	251	208
Iron (ug/L)	758	645	724	688	945
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	16	24.9	31.4	29.9	24.1
Manganese (ug/L)	698	855	672	684	515
Nickel (ug/L)	5	4	4.3	3.9	3.1
Nitrate, nitrite (mg/L)	< .1	.16	.2	.2	.83
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	2.1	2.7	2.8	2.9	2.9
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	6.3	8.3	7.4	8	9.2
Solids, Total Dissolved (mg/L)	204	338	396	372	288
Strontium (ug/L)	172	261	304	301	255
Sulfate (mg/L)	104	162	209	192	137
TKN (mg/L)	< .2	< .2	.24	.37	< .2
Total Phosphorus (mg/L)	< .01	< .01	.013	< .01	.014
Total Suspended Solids (mg/L)	< 5	< 5	7	< 5	< 5
Zinc (ug/L)	< 10	< 10	< 10	< 10	< 10
CorrectedConductance(umhos/cm)	307	458	565	535	400
DissolvedOxygen(mg/L)	8.24	8.01	7.95	7.34	7.89
pH(su)	7.36	7.58	7.46	7.23	7.39
Saturation(percent)	97	86.5	89.2	88.4	85.3
Temperature(deg C)	23.47	19.03	20.94	24.66	19.07
UncorrectedConductance(umhos/cm)	298	406	521	531	355

River Code:	**09-562-000**	Stream:	**LAUREL RUN**
River Mile:	**0.2**	Location:	LAUREL RUN NEAR KNOX @ TWP. RD. 18
Basin:	Southeast Ohio River Tribs	Drainage:	2.6 sq mi

Sample Type: Inorganic	**05-31-2016**	**06-22-2016**	**07-06-2016**	**08-03-2016**	**09-13-2016**
Acidity (mg/L)	< 5	< 5	< 5	< 5	< 5
Alkalinity (mg/L)	61.2	107	68.8	65.4	148
Aluminum (ug/L)	349	< 200	< 200	< 200	< 200
Ammonia (mg/L)	.085	.269	.087	.106	.277
Arsenic (ug/L)	< 2	2.4	< 2	< 2	2.3
Barium (ug/L)	28	48	30	28	60
Bromide (ug/L)			23.7		
Cadmium (ug/L)	< .2	< .2	< .2	< .2	< .2
Calcium (mg/L)	18.2	23.6	17.6	18.8	33.3
Chloride (mg/L)	< 5	< 5	< 5	< 5	< 5
Chromium (ug/L)	< 2	< 2	< 2	< 2	< 2
COD, Chemical Oxygen Demand (mg/L)	< 20	26	< 20	< 20	33
Conductivity (umhos/cm)	168	229	165	188	283
Copper, Low Level (ug/L)	< 2	< 2	< 2	< 2	< 2
Hardness, Total (mg/L)	70	93	67	70	127
Iron (ug/L)	1660	4540	2100	1620	3390
Lead (ug/L)	< 2	< 2	< 2	< 2	< 2
Magnesium (mg/L)	5.9	8.2	5.7	5.7	10.6
Manganese (ug/L)	1570	6820	1370	1310	9230
Nickel (ug/L)	2.1	2.4	< 2	< 2	2.1
Nitrate, nitrite (mg/L)	.16	< .1	.11	< .1	.12
Nitrite (mg/L)	< .02	< .02	< .02	< .02	< .02
Potassium (mg/L)	< 2	< 2	< 2	< 2	2.2
Selenium (ug/L)	< 2	< 2	< 2	< 2	< 2
Sodium (mg/L)	5.2	5.9	< 5	5.6	7
Solids, Total Dissolved (mg/L)	100	142	116	116	170
Strontium (ug/L)	75	102	72	71	138
Sulfate (mg/L)	18.9	10.2	13.1	17	7.6
TKN (mg/L)	.33	.52	.4	.57	.7
Total Phosphorus (mg/L)	.031	.04	.041	.024	.026
Total Suspended Solids (mg/L)	20	14	11	< 5	7
Zinc (ug/L)	< 10	< 10	< 10	19	< 10
CorrectedConductance(umhos/cm)	164	233	178	189	270
DissolvedOxygen(mg/L)	6.7	4.54	6.84	5.84	5.39
pH(su)	7.78	7.15	8.01	7.58	7.63
Saturation(percent)	74.9	50	78.2	68.7	57.3
Temperature(deg C)	20.8	20	21.98	23.47	18.29
UncorrectedConductance(umhos/cm)	151	211	168	183	235

Appendix Table 2. Results from organic scans of water column samples collected during the 2016 Raccoon Creek survey.
All units are ug/L.

303474 WELLSTON PWS NORTH PLANT INTAKE FROM L RACCOON CREEK

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-510-000	30.00	36.1	05090101-04-01	39.13861	-82.51687

	2016/4/12	2016/4/27	2016/5/11	2016/6/7	2016/6/23
Atrazine	<.2	<.2	<.2	<.2	<.2

i Deteced in Blank; o Exceeds Calibration; ¿ QC Criteria Not Met; 1 Invalid Colony Count; ¥ CoAnalyeCorrelation; £ Matrix Interference; ªEstimatedValue; ¯Holding/Shipping Time Exceeded: ¤ PesticideGCDiff

Appendix J — Sediment Chemistry Results

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

203926 TYCOON LAKE, L-1

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-500-002	0.55	1.7	05090101-06-02	38.92690	-82.35360

	19-JUL-2016
% Solids percent	27.3
Aluminum mg/kg	34800
Ammonia mg/kg	160
Arsenic mg/kg	14.3
Barium mg/kg	350
Cadmium mg/kg	.917
Calcium mg/kg	2800
Carbon, Total Organic (TOC) percent	3.5
Chromium mg/kg	28.3
Copper mg/kg	24
Iron mg/kg	53800
Lead mg/kg	32.1
Magnesium mg/kg	3790
Manganese mg/kg	2570
Mercury mg/kg	<.076
Nickel mg/kg	45.7¡
Phosphorus mg/kg	893
Potassium mg/kg	3670
Selenium mg/kg	<2.57
Sodium mg/kg	<6430
Strontium mg/kg	<39
Substrate - clay, fine/medium percent	37
Substrate - claypan soil percent	12
Substrate - sand, coarse percent	0
Substrate - silt, coarse percent	14
Substrate - silt, fine percent	8.2
Substrate - silt, medium percent	4.1
Substrate - silt, very fine percent	25
Zinc mg/kg	191

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

301747 RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-500-000	111.38	42.8	05090101-02-04	39.37289	-82.39531

	15-AUG-2016
% Solids percent	54.4
Aluminum mg/kg	11900
Ammonia mg/kg	12
Arsenic mg/kg	7.84
Barium mg/kg	95.1
Cadmium mg/kg	.291
Calcium mg/kg	1710
Carbon, Total Organic (TOC) percent	1.8
Chromium mg/kg	16
Copper mg/kg	19.7
Iron mg/kg	33900
Lead mg/kg	24.6
Magnesium mg/kg	2760
Manganese mg/kg	343
Mercury mg/kg	<.037
Nickel mg/kg	20.1
Phosphorus mg/kg	635
Potassium mg/kg	1310
Selenium mg/kg	<1.3
Sodium mg/kg	<3240
Strontium mg/kg	22
Substrate - clay, fine/medium percent	38
Substrate - claypan soil percent	8
Substrate - sand, coarse percent	0
Substrate - silt, coarse percent	22
Substrate - silt, fine percent	8
Substrate - silt, medium percent	2
Substrate - silt, very fine percent	22
Zinc mg/kg	81.2

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

302519 RACCOON CREEK DST. HEWETT FORK @ CO. RD. 18 B

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-500-000	89.36	176.0	05090101-03-04	39.30260	-82.32588

	15-AUG-2016
% Solids percent	55.8
Aluminum mg/kg	13000
Ammonia mg/kg	35
Arsenic mg/kg	6.86
Barium mg/kg	130
Cadmium mg/kg	.334
Calcium mg/kg	1520
Carbon, Total Organic (TOC) percent	1.5
Chromium mg/kg	15.9
Copper mg/kg	21.8
Iron mg/kg	29800
Lead mg/kg	18.8
Magnesium mg/kg	2140
Manganese mg/kg	1150
Mercury mg/kg	<.031
Nickel mg/kg	21
Phosphorus mg/kg	494
Potassium mg/kg	<1340
Selenium mg/kg	<1.34
Sodium mg/kg	<3360
Strontium mg/kg	<20
Substrate - clay, fine/medium percent	37
Substrate - claypan soil percent	10
Substrate - sand, coarse percent	0
Substrate - silt, coarse percent	23
Substrate - silt, fine percent	16
Substrate - silt, medium percent	4.1
Substrate - silt, very fine percent	10
Zinc mg/kg	88

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

601400 RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-500-000	29.20	586.0	05090101-06-03	38.87360	-82.35610

	23-AUG-2016
% Solids percent	58.2
Aluminum mg/kg	6540
Ammonia mg/kg	33
Arsenic mg/kg	3.01
Barium mg/kg	106
Cadmium mg/kg	.31
Calcium mg/kg	1500
Carbon, Total Organic (TOC) percent	1
Chromium mg/kg	9.41
Copper mg/kg	12.1
Iron mg/kg	16300
Lead mg/kg	12
Magnesium mg/kg	1100
Manganese mg/kg	720
Mercury mg/kg	<.04
Nickel mg/kg	17.1
Phosphorus mg/kg	435
Potassium mg/kg	<1250
Selenium mg/kg	<1.25
Sodium mg/kg	<3130
Strontium mg/kg	<19
Substrate - clay, fine/medium percent	37
Substrate - claypan soil percent	7.8
Substrate - sand, coarse percent	0
Substrate - silt, coarse percent	26
Substrate - silt, fine percent	18
Substrate - silt, medium percent	2
Substrate - silt, very fine percent	9.7
Zinc mg/kg	71.2

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

W03G50 RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-500-000	80.62	200.0	05090101-03-04	39.23080	-82.28600

	15-AUG-2016
% Solids percent	58.8
Aluminum mg/kg	20400
Ammonia mg/kg	55
Arsenic mg/kg	5.81
Barium mg/kg	125
Cadmium mg/kg	.293
Calcium mg/kg	<1270
Carbon, Total Organic (TOC) percent	1.1
Chromium mg/kg	15.5
Copper mg/kg	16.9
Iron mg/kg	44200
Lead mg/kg	17.1
Magnesium mg/kg	2220
Manganese mg/kg	631
Mercury mg/kg	<.04
Nickel mg/kg	21.7
Phosphorus mg/kg	604
Potassium mg/kg	<1270
Selenium mg/kg	<1.27
Sodium mg/kg	<3170
Strontium mg/kg	<19
Substrate - clay, fine/medium percent	35
Substrate - claypan soil percent	10
Substrate - sand, coarse percent	0
Substrate - silt, coarse percent	21
Substrate - silt, fine percent	22
Substrate - silt, medium percent	4.1
Substrate - silt, very fine percent	8.1
Zinc mg/kg	96.5

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

W03K39 BRUSHY CREEK @ SR 328 NEAR MOUTH

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-571-000	0.36	33.4	05090101-02-03	39.30860	-82.44000

	15-AUG-2016
% Solids percent	53.8
Aluminum mg/kg	8790
Ammonia mg/kg	24
Arsenic mg/kg	4.41
Barium mg/kg	56.4
Cadmium mg/kg	.326
Calcium mg/kg	<1380
Carbon, Total Organic (TOC) percent	2.3
Chromium mg/kg	8.26
Copper mg/kg	10.8
Iron mg/kg	24200
Lead mg/kg	10.5
Magnesium mg/kg	1070
Manganese mg/kg	460
Mercury mg/kg	<.034
Nickel mg/kg	19.6
Phosphorus mg/kg	341
Potassium mg/kg	<1380
Selenium mg/kg	<1.38
Sodium mg/kg	<3440
Strontium mg/kg	<21
Substrate - clay, fine/medium percent	24
Substrate - claypan soil percent	5.9
Substrate - sand, coarse percent	0
Substrate - silt, coarse percent	35
Substrate - silt, fine percent	18
Substrate - silt, medium percent	9.8
Substrate - silt, very fine percent	7.9
Zinc mg/kg	95.2

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

W03P05 RACCOON CREEK AT VINTON @ ST. RT. 160

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-500-000	40.01	381.0	05090101-05-04	38.97610	-82.33830

	23-AUG-2016
% Solids percent	56.4
Aluminum mg/kg	9980
Ammonia mg/kg	23
Arsenic mg/kg	4.04
Barium mg/kg	55.4
Cadmium mg/kg	.4
Calcium mg/kg	<1390
Carbon, Total Organic (TOC) percent	1.5
Chromium mg/kg	11.4
Copper mg/kg	15.6
Iron mg/kg	18500
Lead mg/kg	18.7
Magnesium mg/kg	1320
Manganese mg/kg	368
Mercury mg/kg	.037
Nickel mg/kg	21.3
Phosphorus mg/kg	419
Potassium mg/kg	<1390
Selenium mg/kg	<1.39
Sodium mg/kg	<3480
Strontium mg/kg	<21
Substrate - clay, fine/medium percent	20
Substrate - claypan soil percent	6.1
Substrate - sand, coarse percent	45
Substrate - silt, coarse percent	4[a]
Substrate - silt, fine percent	14[a]
Substrate - silt, medium percent	4[a]
Substrate - silt, very fine percent	6.1
Zinc mg/kg	102

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

W03P18 RACCOON CREEK S OF CLARION @ ST. RT. 124

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-500-000	55.48	322.0	05090101-05-03	39.08420	-82.39110

	23-AUG-2016
% Solids percent	44.9
Aluminum mg/kg	12500
Ammonia mg/kg	43
Arsenic mg/kg	9.59
Barium mg/kg	77.8
Cadmium mg/kg	.586
Calcium mg/kg	2130
Carbon, Total Organic (TOC) percent	2.1
Chromium mg/kg	14.5
Copper mg/kg	21.6
Iron mg/kg	51800
Lead mg/kg	17.6
Magnesium mg/kg	1420
Manganese mg/kg	807
Mercury mg/kg	.058
Nickel mg/kg	27.6
Phosphorus mg/kg	397
Potassium mg/kg	<1620
Selenium mg/kg	2.24
Sodium mg/kg	<4060
Strontium mg/kg	26
Substrate - clay, fine/medium percent	24
Substrate - claypan soil percent	6
Substrate - sand, coarse percent	38
Substrate - silt, coarse percent	4
Substrate - silt, fine percent	18
Substrate - silt, medium percent	2
Substrate - silt, very fine percent	8
Zinc mg/kg	125

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

W03P31 ELK FORK NE OF RADCLIFF @ CO. RD. 43B

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-530-000	0.01	59.8	05090101-03-03	39.16147	-82.35233

	15-AUG-2016
% Solids percent	68.6
Aluminum mg/kg	7470
Ammonia mg/kg	28
Arsenic mg/kg	3.39
Barium mg/kg	92.7
Cadmium mg/kg	.235
Calcium mg/kg	<1020
Carbon, Total Organic (TOC) percent	1.1
Chromium mg/kg	9.16
Copper mg/kg	11
Iron mg/kg	19800
Lead mg/kg	11.3
Magnesium mg/kg	1330
Manganese mg/kg	434
Mercury mg/kg	<.023
Nickel mg/kg	14.9
Phosphorus mg/kg	477
Potassium mg/kg	<1020
Selenium mg/kg	<1.02
Sodium mg/kg	<2560
Strontium mg/kg	<15
Substrate - clay, fine/medium percent	24
Substrate - claypan soil percent	5.6
Substrate - sand, coarse percent	39
Substrate - silt, coarse percent	3.7
Substrate - silt, fine percent	13
Substrate - silt, medium percent	5.6
Substrate - silt, very fine percent	9.3
Zinc mg/kg	61

Appdendix Table 3. Sediment inorganic results for samples collected in support of the 2016 Raccoon Creek survey.

W03S06 L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.

Rivercode	River Mile	Drainage Area	Hydro Unit	Lat	Long
09-510-000	12.71	99.0	05090101-04-03	39.01060	-82.45220

	23-AUG-2016
% Solids percent	49.5
Aluminum mg/kg	14600
Ammonia mg/kg	26
Arsenic mg/kg	8.12
Barium mg/kg	73.2
Cadmium mg/kg	.615
Calcium mg/kg	1850
Carbon, Total Organic (TOC) percent	2.2
Chromium mg/kg	16.9
Copper mg/kg	18.8
Iron mg/kg	48500
Lead mg/kg	23.8
Magnesium mg/kg	1650
Manganese mg/kg	767
Mercury mg/kg	.045
Nickel mg/kg	32.8
Phosphorus mg/kg	558
Potassium mg/kg	<1370
Selenium mg/kg	<1.37
Sodium mg/kg	<3440
Strontium mg/kg	<21
Substrate - clay, fine/medium percent	26
Substrate - claypan soil percent	6.1
Substrate - sand, coarse percent	39
Substrate - silt, coarse percent	4.1
Substrate - silt, fine percent	14
Substrate - silt, medium percent	2
Substrate - silt, very fine percent	8.1
Zinc mg/kg	145

¡ Deteced in Blank; º Exceeds Calibration; ¿ QC Criteria Not Met; ¹ Invalid Colony Count; ¥ CoAnalyeCorrelation; £ Matrix Interference; ªEstimatedValue; ¯Holding/Shipping Time Exceeded; ¤ PesticideGCDiff

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
203930 LAKE RUPERT, L-1			
OTHER	**25-JUL-2016**		
% Solids	31.2		percent
4-Chloro-3-methylphenol	<6.38		mg/kg
Acetophenone	<1.28		mg/kg
2-Acetylaminofluorene	<1.28		mg/kg
Aniline	<1.28		mg/kg
Benzyl Alcohol	<1.28		mg/kg
4-Bromophenyl-phenylether	<1.28		mg/kg
Butylbenzylphthalate	<1.28		mg/kg
2-Chloronaphthalene	<1.28		mg/kg
2-Chlorophenol	<1.28		mg/kg
4-Chlorophenyl-phenylether	<1.28		mg/kg
2-Methylphenol	<1.28		mg/kg
3-,4-methylphenol	<6.38		mg/kg
Dinoseb	<1.28		mg/kg
Di-n-butylphthalate	<1.28		mg/kg
1,2-Dichlorobenzene	<1.28		mg/kg
1,3-Dichlorobenzene	<1.28		mg/kg
1,4-Dichlorobenzene	<1.28		mg/kg
3,3'-Dichlorobenzidine	<6.4		mg/kg
2,4-Dichlorophenol	<1.28		mg/kg
2,6-Dichlorophenol	<1.28		mg/kg
Diethylphthalate	<1.28		mg/kg
Dimethylphthalate	<1.28		mg/kg
p-Dimethylaminoazobenzene	<1.28		mg/kg
7,12-Dimethylbenz[a]anthracene	<1.3		mg/kg
2,4-Dimethylphenol	<1.28		mg/kg
4,6-Dinitro-2-methylphenol	<6.38		mg/kg
1,3-Dinitrobenzene	<1.28		mg/kg
2,4-Dinitrophenol	<6.4		mg/kg
2,4-Dinitrotoluene	<1.28		mg/kg
2,6-Dinitrotoluene	<1.28		mg/kg
Diphenylamine	<1.28		mg/kg
Ethyl methanesulfonate	<1.28		mg/kg
Hexachlorobenzene	<1.28		mg/kg
Hexachlorobutadiene	<1.28		mg/kg
Hexachlorocyclopentadiene	<1.28		mg/kg
Hexachloroethane	<1.28		mg/kg
Hexachloropropene	<1.28		mg/kg
Isophorone	<1.28		mg/kg
Methyl methanesulfonate	<1.28		mg/kg
Nitrobenzene	<1.28		mg/kg
2-Nitroaniline	<1.28		mg/kg
4-Nitroaniline	<1.28		mg/kg
2-Nitrophenol	<1.28		mg/kg
4-Nitrophenol	<6.4		mg/kg
N-Nitroso-di-n-butylamine	<1.28		mg/kg
N-Nitroso-di-n-propylamine	<1.28		mg/kg
N-Nitrosomorpholine	<1.28		mg/kg
N-Nitrosopiperidine	<1.28		mg/kg
N-Nitrosopyrrolidine	<1.28		mg/kg
PCB-1016	<32		ug/kg
PCB-1221	<32		ug/kg
PCB-1232	<32		ug/kg
PCB-1242	<32		ug/kg
PCB-1248	<32		ug/kg
PCB-1254	<32		ug/kg
PCB-1260	<32		ug/kg
Pentachlorobenzene	<1.28		mg/kg
Pentachlorophenol	<6.38		mg/kg
Phenacetin	<1.28		mg/kg
Phenol	<1.28		mg/kg
2-Picoline	<1.28		mg/kg
Pronamide	<1.28		mg/kg
Safrole	<1.28		mg/kg
1,2,4,5-Tetrachlorobenzene	<1.28		mg/kg
2,3,4,6-Tetrachlorophenol	<1.28		mg/kg
1,2,4-Trichlorobenzene	<1.28		mg/kg
2,4,5-Trichlorophenol	<1.28		mg/kg
2,4,6-Trichlorophenol	<1.28		mg/kg
bis(2-Chloroisopropyl)ether	<1.28		mg/kg
bis(2-Chloroethoxy)methane	<1.28		mg/kg
bis(2-Chloroethyl)ether	<1.28		mg/kg
bis(2-Ethylhexyl)phthalate	<1.28		mg/kg
Di-n-octylphthalate	<1.28		mg/kg
PAH	**25-JUL-2016**		
Acenaphthene	<1.28	30	mg/kg
Acenaphthylene	<1.28	30	mg/kg
Anthracene	<1.28	30	mg/kg
Benzo(a)anthracene	<1.28	30	mg/kg
Benzo(a)pyrene	<1.28	30	mg/kg
Benzo(b)fluoranthene	<1.28	30	mg/kg
Benzo[g,h,i]perylene	<1.28	30	mg/kg
Benzo[k]fluoranthene	<1.28	30	mg/kg
Chrysene	<1.28	30	mg/kg
Dibenz[a,h]anthracene	<1.28	30	mg/kg
Dibenzofuran	<1.28	30	mg/kg
Fluoranthene	<1.28	30	mg/kg
Fluorene	<1.28	30	mg/kg
Indeno[1,2,3-cd]pyrene	<1.28	30	mg/kg
3-Methylcholanthrene	<1.28	30	mg/kg
2-Methylnaphthalene	<1.28	30	mg/kg
Naphthalene	<1.28	30	mg/kg
1,4-Naphthoquinone	<1.28	30	mg/kg
Phenanthrene	<1.28	30	mg/kg
Pyrene	<1.28	30	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
301747 RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328			
OTHER	**15-AUG-2016**		
% Solids	58.3		percent
1,2,4,5-Tetrachlorobenzene	<3.41		mg/kg
1,2,4-Trichlorobenzene	<3.41		mg/kg
1,2-Dichlorobenzene	<3.41		mg/kg
1,3-Dichlorobenzene	<3.41		mg/kg
1,3-Dinitrobenzene	<3.41		mg/kg
1,4-Dichlorobenzene	<3.41		mg/kg
2,3,4,6-Tetrachlorophenol	<3.41		mg/kg
2,4,5-Trichlorophenol	<3.41		mg/kg
2,4,6-Trichlorophenol	<3.41		mg/kg
2,4-Dichlorophenol	<3.41		mg/kg
2,4-Dimethylphenol	<3.41		mg/kg
2,4-Dinitrophenol	<17.1		mg/kg
2,4-Dinitrotoluene	<3.41		mg/kg
2,6-Dichlorophenol	<3.41		mg/kg
2,6-Dinitrotoluene	<3.41		mg/kg
2-Acetylaminofluorene	<3.41		mg/kg
2-Chloronaphthalene	<3.41		mg/kg
2-Chlorophenol	<3.41		mg/kg
2-Methylphenol	<3.41		mg/kg
2-Nitroaniline	<3.41		mg/kg
2-Nitrophenol	<3.41		mg/kg
2-Picoline	<3.41		mg/kg
3-,4-methylphenol	<17.1		mg/kg
3,3'-Dichlorobenzidine	<17.1		mg/kg
4,6-Dinitro-2-methylphenol	<17.1		mg/kg
4-Bromophenyl-phenylether	<3.41		mg/kg
4-Chloro-3-methylphenol	<17.1		mg/kg
4-Chlorophenyl-phenylether	<3.41		mg/kg
4-Nitroaniline	<3.41		mg/kg
4-Nitrophenol	<17.1		mg/kg
7,12-Dimethylbenz[a]anthracene	<3.4		mg/kg
Acetophenone	<3.41		mg/kg
Aniline	<3.41		mg/kg
Benzyl Alcohol	<3.41		mg/kg
Butylbenzylphthalate	<3.41		mg/kg
Di-n-butylphthalate	<3.41		mg/kg
Di-n-octylphthalate	<3.41		mg/kg
Diethylphthalate	<3.41		mg/kg
Dimethylphthalate	<3.41		mg/kg
Dinoseb	<3.41		mg/kg
Diphenylamine	<3.41		mg/kg
Ethyl methanesulfonate	<3.41		mg/kg
Hexachlorobenzene	<3.41		mg/kg
Hexachlorobutadiene	<3.41		mg/kg
Hexachlorocyclopentadiene	<3.41		mg/kg
Hexachloroethane	<3.41		mg/kg
Hexachloropropene	<3.41		mg/kg
Isophorone	<3.41		mg/kg
Methyl methanesulfonate	<3.41		mg/kg
N-Nitroso-di-n-butylamine	<3.41		mg/kg
N-Nitroso-di-n-propylamine	<3.41		mg/kg
N-Nitrosomorpholine	<3.41		mg/kg
N-Nitrosopiperidine	<3.41		mg/kg
N-Nitrosopyrrolidine	<3.41		mg/kg
Nitrobenzene	<3.41		mg/kg
Pentachlorobenzene	<3.41		mg/kg
Pentachlorophenol	<17.1		mg/kg
Phenacetin	<3.41		mg/kg
Phenol	<3.41		mg/kg
Pronamide	<3.41		mg/kg
Safrole	<3.41		mg/kg
bis(2-Chloroethoxy)methane	<3.41		mg/kg
bis(2-Chloroethyl)ether	<3.41		mg/kg
bis(2-Chloroisopropyl)ether	<3.41		mg/kg
bis(2-Ethylhexyl)phthalate	<3.41		mg/kg
p-Dimethylaminoazobenzene	<3.41		mg/kg
PAH	**15-AUG-2016**		
1,4-Naphthoquinone	<3.41	95	mg/kg
2-Methylnaphthalene	<3.41	95	mg/kg
3-Methylcholanthrene	<3.41	95	mg/kg
Acenaphthene	<3.41	95	mg/kg
Acenaphthylene	<3.41	95	mg/kg
Anthracene	<3.41	95	mg/kg
Benzo(a)anthracene	<3.41	95	mg/kg
Benzo(a)pyrene	<3.41	95	mg/kg
Benzo(b)fluoranthene	<3.41	95	mg/kg
Benzo[g,h,i]perylene	<3.41	95	mg/kg
Benzo[k]fluoranthene	<3.41	95	mg/kg
Chrysene	<3.41	95	mg/kg
Dibenz[a,h]anthracene	<3.41	95	mg/kg
Dibenzofuran	<3.41	95	mg/kg
Fluoranthene	<3.41	95	mg/kg
Fluorene	<3.41	95	mg/kg
Indeno[1,2,3-cd]pyrene	<3.41	95	mg/kg
Naphthalene	<3.41	95	mg/kg
Phenanthrene	<3.41	95	mg/kg
Pyrene	<3.41	95	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
302519 RACCOON CREEK DST. HEWETT FORK @ CO. RD. 18 B			
OTHER	**15-AUG-2016**		
% Solids	53.7		percent
1,2,4,5-Tetrachlorobenzene	<3.71		mg/kg
1,2,4-Trichlorobenzene	<3.71		mg/kg
1,2-Dichlorobenzene	<3.71		mg/kg
1,3-Dichlorobenzene	<3.71		mg/kg
1,3-Dinitrobenzene	<3.71		mg/kg
1,4-Dichlorobenzene	<3.71		mg/kg
2,3,4,6-Tetrachlorophenol	<3.71		mg/kg
2,4,5-Trichlorophenol	<3.71		mg/kg
2,4,6-Trichlorophenol	<3.71		mg/kg
2,4-Dichlorophenol	<3.71		mg/kg
2,4-Dimethylphenol	<3.71		mg/kg
2,4-Dinitrophenol	<18.6		mg/kg
2,4-Dinitrotoluene	<3.71		mg/kg
2,6-Dichlorophenol	<3.71		mg/kg
2,6-Dinitrotoluene	<3.71		mg/kg
2-Acetylaminofluorene	<3.71		mg/kg
2-Chloronaphthalene	<3.71		mg/kg
2-Chlorophenol	<3.71		mg/kg
2-Methylphenol	<3.71		mg/kg
2-Nitroaniline	<3.71		mg/kg
2-Nitrophenol	<3.71		mg/kg
2-Picoline	<3.71		mg/kg
3-,4-methylphenol	<18.6		mg/kg
3,3'-Dichlorobenzidine	<18.6		mg/kg
4,6-Dinitro-2-methylphenol	<18.6		mg/kg
4-Bromophenyl-phenylether	<3.71		mg/kg
4-Chloro-3-methylphenol	<18.6		mg/kg
4-Chlorophenyl-phenylether	<3.71		mg/kg
4-Nitroaniline	<3.71		mg/kg
4-Nitrophenol	<18.6		mg/kg
7,12-Dimethylbenz[a]anthracene	<3.7		mg/kg
Acetophenone	<3.71		mg/kg
Aniline	<3.71		mg/kg
Benzyl Alcohol	<3.71		mg/kg
Butylbenzylphthalate	<3.71		mg/kg
Di-n-butylphthalate	<3.71		mg/kg
Di-n-octylphthalate	<3.71		mg/kg
Diethylphthalate	<3.71		mg/kg
Dimethylphthalate	<3.71		mg/kg
Dinoseb	<3.71		mg/kg
Diphenylamine	<3.71		mg/kg
Ethyl methanesulfonate	<3.71		mg/kg
Hexachlorobenzene	<3.71		mg/kg
Hexachlorobutadiene	<3.71		mg/kg
Hexachlorocyclopentadiene	<3.71		mg/kg
Hexachloroethane	<3.71		mg/kg
Hexachloropropene	<3.71		mg/kg
Isophorone	<3.71		mg/kg
Methyl methanesulfonate	<3.71		mg/kg
N-Nitroso-di-n-butylamine	<3.71		mg/kg
N-Nitroso-di-n-propylamine	<3.71		mg/kg
N-Nitrosomorpholine	<3.71		mg/kg
N-Nitrosopiperidine	<3.71		mg/kg
N-Nitrosopyrrolidine	<3.71		mg/kg
Nitrobenzene	<3.71		mg/kg
Pentachlorobenzene	<3.71		mg/kg
Pentachlorophenol	<18.6		mg/kg
Phenacetin	<3.71		mg/kg
Phenol	<3.71		mg/kg
Pronamide	<3.71		mg/kg
Safrole	<3.71		mg/kg
bis(2-Chloroethoxy)methane	<3.71		mg/kg
bis(2-Chloroethyl)ether	<3.71		mg/kg
bis(2-Chloroisopropyl)ether	<3.71		mg/kg
bis(2-Ethylhexyl)phthalate	<3.71		mg/kg
p-Dimethylaminoazobenzene	<3.71		mg/kg
PAH	**15-AUG-2016**		
1,4-Naphthoquinone	<3.71	124	mg/kg
2-Methylnaphthalene	<3.71	124	mg/kg
3-Methylcholanthrene	<3.71	124	mg/kg
Acenaphthene	<3.71	124	mg/kg
Acenaphthylene	<3.71	124	mg/kg
Anthracene	<3.71	124	mg/kg
Benzo(a)anthracene	<3.71	124	mg/kg
Benzo(a)pyrene	<3.71	124	mg/kg
Benzo(b)fluoranthene	<3.71	124	mg/kg
Benzo[g,h,i]perylene	<3.71	124	mg/kg
Benzo[k]fluoranthene	<3.71	124	mg/kg
Chrysene	<3.71	124	mg/kg
Dibenz[a,h]anthracene	<3.71	124	mg/kg
Dibenzofuran	<3.71	124	mg/kg
Fluoranthene	<3.71	124	mg/kg
Fluorene	<3.71	124	mg/kg
Indeno[1,2,3-cd]pyrene	<3.71	124	mg/kg
Naphthalene	<3.71	124	mg/kg
Phenanthrene	<3.71	124	mg/kg
Pyrene	<3.71	124	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
601400 RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35			
OTHER	**23-AUG-2016**		
% Solids	59.2		percent
1,2,4,5-Tetrachlorobenzene	<2.66		mg/kg
1,2,4-Trichlorobenzene	<2.66		mg/kg
1,2-Dichlorobenzene	<2.66		mg/kg
1,3-Dichlorobenzene	<2.66		mg/kg
1,3-Dinitrobenzene	<2.66		mg/kg
1,4-Dichlorobenzene	<2.66		mg/kg
2,3,4,6-Tetrachlorophenol	<2.66		mg/kg
2,4,5-Trichlorophenol	<2.66		mg/kg
2,4,6-Trichlorophenol	<2.66		mg/kg
2,4-Dichlorophenol	<2.66		mg/kg
2,4-Dimethylphenol	<2.66		mg/kg
2,4-Dinitrophenol	<13.3		mg/kg
2,4-Dinitrotoluene	<2.66		mg/kg
2,6-Dichlorophenol	<2.66		mg/kg
2,6-Dinitrotoluene	<2.66		mg/kg
2-Acetylaminofluorene	<2.66		mg/kg
2-Chloronaphthalene	<2.66		mg/kg
2-Chlorophenol	<2.66		mg/kg
2-Methylphenol	<2.66		mg/kg
2-Nitroaniline	<2.66		mg/kg
2-Nitrophenol	<2.66		mg/kg
2-Picoline	<2.66		mg/kg
3-,4-methylphenol	<13.3		mg/kg
3,3'-Dichlorobenzidine	<13.3		mg/kg
4,6-Dinitro-2-methylphenol	<13.3		mg/kg
4-Bromophenyl-phenylether	<2.66		mg/kg
4-Chloro-3-methylphenol	<13.3		mg/kg
4-Chlorophenyl-phenylether	<2.66		mg/kg
4-Nitroaniline	<2.66		mg/kg
4-Nitrophenol	<13.3		mg/kg
7,12-Dimethylbenz[a]anthracene	<2.7		mg/kg
Acetophenone	<2.66		mg/kg
Aniline	<2.66		mg/kg
Benzyl Alcohol	<2.66		mg/kg
Butylbenzylphthalate	<2.66		mg/kg
Di-n-butylphthalate	<2.66		mg/kg
Di-n-octylphthalate	<2.66		mg/kg
Diethylphthalate	<2.66		mg/kg
Dimethylphthalate	<2.66		mg/kg
Dinoseb	<2.66		mg/kg
Diphenylamine	<2.66		mg/kg
Ethyl methanesulfonate	<2.66		mg/kg
Hexachlorobenzene	<2.66		mg/kg
Hexachlorobutadiene	<2.66		mg/kg
Hexachlorocyclopentadiene	<2.66		mg/kg
Hexachloroethane	<2.66		mg/kg
Hexachloropropene	<2.66		mg/kg
Isophorone	<2.66		mg/kg
Methyl methanesulfonate	<2.66		mg/kg
N-Nitroso-di-n-butylamine	<2.66		mg/kg
N-Nitroso-di-n-propylamine	<2.66		mg/kg
N-Nitrosomorpholine	<2.66		mg/kg
N-Nitrosopiperidine	<2.66		mg/kg
N-Nitrosopyrrolidine	<2.66		mg/kg
Nitrobenzene	<2.66		mg/kg
Pentachlorobenzene	<2.66		mg/kg
Pentachlorophenol	<13.3		mg/kg
Phenacetin	<2.66		mg/kg
Phenol	<2.66		mg/kg
Pronamide	<2.66		mg/kg
Safrole	<2.66		mg/kg
bis(2-Chloroethoxy)methane	<2.66		mg/kg
bis(2-Chloroethyl)ether	<2.66		mg/kg
bis(2-Chloroisopropyl)ether	<2.66		mg/kg
bis(2-Ethylhexyl)phthalate	<2.66		mg/kg
p-Dimethylaminoazobenzene	<2.66		mg/kg
PAH	**23-AUG-2016**		
1,4-Naphthoquinone	<2.66	133	mg/kg
2-Methylnaphthalene	<2.66	133	mg/kg
3-Methylcholanthrene	<2.66	133	mg/kg
Acenaphthene	<2.66	133	mg/kg
Acenaphthylene	<2.66	133	mg/kg
Anthracene	<2.66	133	mg/kg
Benzo(a)anthracene	<2.66	133	mg/kg
Benzo(a)pyrene	<2.66	133	mg/kg
Benzo(b)fluoranthene	<2.66	133	mg/kg
Benzo[g,h,i]perylene	<2.66	133	mg/kg
Benzo[k]fluoranthene	<2.66	133	mg/kg
Chrysene	<2.66	133	mg/kg
Dibenz[a,h]anthracene	<2.66	133	mg/kg
Dibenzofuran	<2.66	133	mg/kg
Fluoranthene	<2.66	133	mg/kg
Fluorene	<2.66	133	mg/kg
Indeno[1,2,3-cd]pyrene	<2.66	133	mg/kg
Naphthalene	<2.66	133	mg/kg
Phenanthrene	<2.66	133	mg/kg
Pyrene	<2.66	133	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
W03G50 RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50			
OTHER	**15-AUG-2016**		
% Solids	57.5		percent
1,2,4,5-Tetrachlorobenzene	<3.47		mg/kg
1,2,4-Trichlorobenzene	<3.47		mg/kg
1,2-Dichlorobenzene	<3.47		mg/kg
1,3-Dichlorobenzene	<3.47		mg/kg
1,3-Dinitrobenzene	<3.47		mg/kg
1,4-Dichlorobenzene	<3.47		mg/kg
2,3,4,6-Tetrachlorophenol	<3.47		mg/kg
2,4,5-Trichlorophenol	<3.47		mg/kg
2,4,6-Trichlorophenol	<3.47		mg/kg
2,4-Dichlorophenol	<3.47		mg/kg
2,4-Dimethylphenol	<3.47		mg/kg
2,4-Dinitrophenol	<17.4		mg/kg
2,4-Dinitrotoluene	<3.47		mg/kg
2,6-Dichlorophenol	<3.47		mg/kg
2,6-Dinitrotoluene	<3.47		mg/kg
2-Acetylaminofluorene	<3.47		mg/kg
2-Chloronaphthalene	<3.47		mg/kg
2-Chlorophenol	<3.47		mg/kg
2-Methylphenol	<3.47		mg/kg
2-Nitroaniline	<3.47		mg/kg
2-Nitrophenol	<3.47		mg/kg
2-Picoline	<3.47		mg/kg
3-,4-methylphenol	<17.4		mg/kg
3,3'-Dichlorobenzidine	<17.4		mg/kg
4,6-Dinitro-2-methylphenol	<17.4		mg/kg
4-Bromophenyl-phenylether	<3.47		mg/kg
4-Chloro-3-methylphenol	<17.4		mg/kg
4-Chlorophenyl-phenylether	<3.47		mg/kg
4-Nitroaniline	<3.47		mg/kg
4-Nitrophenol	<17.4		mg/kg
7,12-Dimethylbenz[a]anthracene	<3.5		mg/kg
Acetophenone	<3.47		mg/kg
Aniline	<3.47		mg/kg
Benzyl Alcohol	<3.47		mg/kg
Butylbenzylphthalate	<3.47		mg/kg
Di-n-butylphthalate	<3.47		mg/kg
Di-n-octylphthalate	<3.47		mg/kg
Diethylphthalate	<3.47		mg/kg
Dimethylphthalate	<3.47		mg/kg
Dinoseb	<3.47		mg/kg
Diphenylamine	<3.47		mg/kg
Ethyl methanesulfonate	<3.47		mg/kg
Hexachlorobenzene	<3.47		mg/kg
Hexachlorobutadiene	<3.47		mg/kg
Hexachlorocyclopentadiene	<3.47		mg/kg
Hexachloroethane	<3.47		mg/kg
Hexachloropropene	<3.47		mg/kg
Isophorone	<3.47		mg/kg
Methyl methanesulfonate	<3.47		mg/kg
N-Nitroso-di-n-butylamine	<3.47		mg/kg
N-Nitroso-di-n-propylamine	<3.47		mg/kg
N-Nitrosomorpholine	<3.47		mg/kg
N-Nitrosopiperidine	<3.47		mg/kg
N-Nitrosopyrrolidine	<3.47		mg/kg
Nitrobenzene	<3.47		mg/kg
Pentachlorobenzene	<3.47		mg/kg
Pentachlorophenol	<17.4		mg/kg
Phenacetin	<3.47		mg/kg
Phenol	<3.47		mg/kg
Pronamide	<3.47		mg/kg
Safrole	<3.47		mg/kg
bis(2-Chloroethoxy)methane	<3.47		mg/kg
bis(2-Chloroethyl)ether	<3.47		mg/kg
bis(2-Chloroisopropyl)ether	<3.47		mg/kg
bis(2-Ethylhexyl)phthalate	<3.47		mg/kg
p-Dimethylaminoazobenzene	<3.47		mg/kg
PAH	**15-AUG-2016**		
1,4-Naphthoquinone	<3.47	158	mg/kg
2-Methylnaphthalene	<3.47	158	mg/kg
3-Methylcholanthrene	<3.47	158	mg/kg
Acenaphthene	<3.47	158	mg/kg
Acenaphthylene	<3.47	158	mg/kg
Anthracene	<3.47	158	mg/kg
Benzo(a)anthracene	<3.47	158	mg/kg
Benzo(a)pyrene	<3.47	158	mg/kg
Benzo(b)fluoranthene	<3.47	158	mg/kg
Benzo[g,h,i]perylene	<3.47	158	mg/kg
Benzo[k]fluoranthene	<3.47	158	mg/kg
Chrysene	<3.47	158	mg/kg
Dibenz[a,h]anthracene	<3.47	158	mg/kg
Dibenzofuran	<3.47	158	mg/kg
Fluoranthene	<3.47	158	mg/kg
Fluorene	<3.47	158	mg/kg
Indeno[1,2,3-cd]pyrene	<3.47	158	mg/kg
Naphthalene	<3.47	158	mg/kg
Phenanthrene	<3.47	158	mg/kg
Pyrene	<3.47	158	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
W03K39 BRUSHY CREEK @ SR 328 NEAR MOUTH			
OTHER	**15-AUG-2016**		
% Solids	51		percent
1,2,4,5-Tetrachlorobenzene	<3.89		mg/kg
1,2,4-Trichlorobenzene	<3.89		mg/kg
1,2-Dichlorobenzene	<3.89		mg/kg
1,3-Dichlorobenzene	<3.89		mg/kg
1,3-Dinitrobenzene	<3.89		mg/kg
1,4-Dichlorobenzene	<3.89		mg/kg
2,3,4,6-Tetrachlorophenol	<3.89		mg/kg
2,4,5-Trichlorophenol	<3.89		mg/kg
2,4,6-Trichlorophenol	<3.89		mg/kg
2,4-Dichlorophenol	<3.89		mg/kg
2,4-Dimethylphenol	<3.89		mg/kg
2,4-Dinitrophenol	<19.4		mg/kg
2,4-Dinitrotoluene	<3.89		mg/kg
2,6-Dichlorophenol	<3.89		mg/kg
2,6-Dinitrotoluene	<3.89		mg/kg
2-Acetylaminofluorene	<3.89		mg/kg
2-Chloronaphthalene	<3.89		mg/kg
2-Chlorophenol	<3.89		mg/kg
2-Methylphenol	<3.89		mg/kg
2-Nitroaniline	<3.89		mg/kg
2-Nitrophenol	<3.89		mg/kg
2-Picoline	<3.89		mg/kg
3-,4-methylphenol	<19.4		mg/kg
3,3'-Dichlorobenzidine	<19.4		mg/kg
4,6-Dinitro-2-methylphenol	<19.4		mg/kg
4-Bromophenyl-phenylether	<3.89		mg/kg
4-Chloro-3-methylphenol	<19.4		mg/kg
4-Chlorophenyl-phenylether	<3.89		mg/kg
4-Nitroaniline	<3.89		mg/kg
4-Nitrophenol	<19.4		mg/kg
7,12-Dimethylbenz[a]anthracene	<3.9		mg/kg
Acetophenone	<3.89		mg/kg
Aniline	<3.89		mg/kg
Benzyl Alcohol	<3.89		mg/kg
Butylbenzylphthalate	<3.89		mg/kg
Di-n-butylphthalate	<3.89		mg/kg
Di-n-octylphthalate	<3.89		mg/kg
Diethylphthalate	<3.89		mg/kg
Dimethylphthalate	<3.89		mg/kg
Dinoseb	<3.89		mg/kg
Diphenylamine	<3.89		mg/kg
Ethyl methanesulfonate	<3.89		mg/kg
Hexachlorobenzene	<3.89		mg/kg
Hexachlorobutadiene	<3.89		mg/kg
Hexachlorocyclopentadiene	<3.89		mg/kg
Hexachloroethane	<3.89		mg/kg
Hexachloropropene	<3.89		mg/kg
Isophorone	<3.89		mg/kg
Methyl methanesulfonate	<3.89		mg/kg
N-Nitroso-di-n-butylamine	<3.89		mg/kg
N-Nitroso-di-n-propylamine	<3.89		mg/kg
N-Nitrosomorpholine	<3.89		mg/kg
N-Nitrosopiperidine	<3.89		mg/kg
N-Nitrosopyrrolidine	<3.89		mg/kg
Nitrobenzene	<3.89		mg/kg
Pentachlorobenzene	<3.89		mg/kg
Pentachlorophenol	<19.4		mg/kg
Phenacetin	<3.89		mg/kg
Phenol	<3.89		mg/kg
Pronamide	<3.89		mg/kg
Safrole	<3.89		mg/kg
bis(2-Chloroethoxy)methane	<3.89		mg/kg
bis(2-Chloroethyl)ether	<3.89		mg/kg
bis(2-Chloroisopropyl)ether	<3.89		mg/kg
bis(2-Ethylhexyl)phthalate	<3.89		mg/kg
p-Dimethylaminoazobenzene	<3.89		mg/kg
PAH	**15-AUG-2016**		
1,4-Naphthoquinone	<3.89	85	mg/kg
2-Methylnaphthalene	<3.89	85	mg/kg
3-Methylcholanthrene	<3.89	85	mg/kg
Acenaphthene	<3.89	85	mg/kg
Acenaphthylene	<3.89	85	mg/kg
Anthracene	<3.89	85	mg/kg
Benzo(a)anthracene	<3.89	85	mg/kg
Benzo(a)pyrene	<3.89	85	mg/kg
Benzo(b)fluoranthene	<3.89	85	mg/kg
Benzo[g,h,i]perylene	<3.89	85	mg/kg
Benzo[k]fluoranthene	<3.89	85	mg/kg
Chrysene	<3.89	85	mg/kg
Dibenz[a,h]anthracene	<3.89	85	mg/kg
Dibenzofuran	<3.89	85	mg/kg
Fluoranthene	<3.89	85	mg/kg
Fluorene	<3.89	85	mg/kg
Indeno[1,2,3-cd]pyrene	<3.89	85	mg/kg
Naphthalene	<3.89	85	mg/kg
Phenanthrene	<3.89	85	mg/kg
Pyrene	<3.89	85	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
W03P05 RACCOON CREEK AT VINTON @ ST. RT. 160			
OTHER	**23-AUG-2016**		
% Solids	57		percent
1,2,4,5-Tetrachlorobenzene	<2.73		mg/kg
1,2,4-Trichlorobenzene	<2.73		mg/kg
1,2-Dichlorobenzene	<2.73		mg/kg
1,3-Dichlorobenzene	<2.73		mg/kg
1,3-Dinitrobenzene	<2.73		mg/kg
1,4-Dichlorobenzene	<2.73		mg/kg
2,3,4,6-Tetrachlorophenol	<2.73		mg/kg
2,4,5-Trichlorophenol	<2.73		mg/kg
2,4,6-Trichlorophenol	<2.73		mg/kg
2,4-Dichlorophenol	<2.73		mg/kg
2,4-Dimethylphenol	<2.73		mg/kg
2,4-Dinitrophenol	<13.6		mg/kg
2,4-Dinitrotoluene	<2.73		mg/kg
2,6-Dichlorophenol	<2.73		mg/kg
2,6-Dinitrotoluene	<2.73		mg/kg
2-Acetylaminofluorene	<2.73		mg/kg
2-Chloronaphthalene	<2.73		mg/kg
2-Chlorophenol	<2.73		mg/kg
2-Methylphenol	<2.73		mg/kg
2-Nitroaniline	<2.73		mg/kg
2-Nitrophenol	<2.73		mg/kg
2-Picoline	<2.73		mg/kg
3-,4-methylphenol	<13.6		mg/kg
3,3'-Dichlorobenzidine	<13.6		mg/kg
4,6-Dinitro-2-methylphenol	<13.6		mg/kg
4-Bromophenyl-phenylether	<2.73		mg/kg
4-Chloro-3-methylphenol	<13.6		mg/kg
4-Chlorophenyl-phenylether	<2.73		mg/kg
4-Nitroaniline	<2.73		mg/kg
4-Nitrophenol	<13.6		mg/kg
7,12-Dimethylbenz[a]anthracene	<2.7		mg/kg
Acetophenone	<2.73		mg/kg
Aniline	<2.73		mg/kg
Benzyl Alcohol	<2.73		mg/kg
Butylbenzylphthalate	<2.73		mg/kg
Di-n-butylphthalate	<2.73		mg/kg
Di-n-octylphthalate	<2.73		mg/kg
Diethylphthalate	<2.73		mg/kg
Dimethylphthalate	<2.73		mg/kg
Dinoseb	<2.73		mg/kg
Diphenylamine	<2.73		mg/kg
Ethyl methanesulfonate	<2.73		mg/kg
Hexachlorobenzene	<2.73		mg/kg
Hexachlorobutadiene	<2.73		mg/kg
Hexachlorocyclopentadiene	<2.73		mg/kg
Hexachloroethane	<2.73		mg/kg
Hexachloropropene	<2.73		mg/kg
Isophorone	<2.73		mg/kg
Methyl methanesulfonate	<2.73		mg/kg
N-Nitroso-di-n-butylamine	<2.73		mg/kg
N-Nitroso-di-n-propylamine	5.09		mg/kg
N-Nitrosomorpholine	<2.73		mg/kg
N-Nitrosopiperidine	<2.73		mg/kg
N-Nitrosopyrrolidine	<2.73		mg/kg
Nitrobenzene	<2.73		mg/kg
Pentachlorobenzene	<2.73		mg/kg
Pentachlorophenol	<13.6		mg/kg
Phenacetin	<2.73		mg/kg
Phenol	<2.73		mg/kg
Pronamide	<2.73		mg/kg
Safrole	<2.73		mg/kg
bis(2-Chloroethoxy)methane	<2.73		mg/kg
bis(2-Chloroethyl)ether	<2.73		mg/kg
bis(2-Chloroisopropyl)ether	<2.73		mg/kg
bis(2-Ethylhexyl)phthalate	<2.73		mg/kg
p-Dimethylaminoazobenzene	<2.73		mg/kg
PAH	**23-AUG-2016**		
1,4-Naphthoquinone	<2.73	91	mg/kg
2-Methylnaphthalene	<2.73	91	mg/kg
3-Methylcholanthrene	<2.73	91	mg/kg
Acenaphthene	<2.73	91	mg/kg
Acenaphthylene	<2.73	91	mg/kg
Anthracene	<2.73	91	mg/kg
Benzo(a)anthracene	<2.73	91	mg/kg
Benzo(a)pyrene	<2.73	91	mg/kg
Benzo(b)fluoranthene	<2.73	91	mg/kg
Benzo[g,h,i]perylene	<2.73	91	mg/kg
Benzo[k]fluoranthene	<2.73	91	mg/kg
Chrysene	<2.73	91	mg/kg
Dibenz[a,h]anthracene	<2.73	91	mg/kg
Dibenzofuran	<2.73	91	mg/kg
Fluoranthene	<2.73	91	mg/kg
Fluorene	<2.73	91	mg/kg
Indeno[1,2,3-cd]pyrene	<2.73	91	mg/kg
Naphthalene	<2.73	91	mg/kg
Phenanthrene	<2.73	91	mg/kg
Pyrene	<2.73	91	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
W03P18 RACCOON CREEK S OF CLARION @ ST. RT. 124			
OTHER	**23-AUG-2016**		
% Solids	49.7		percent
1,2,4,5-Tetrachlorobenzene	<3.07		mg/kg
1,2,4-Trichlorobenzene	<3.07		mg/kg
1,2-Dichlorobenzene	<3.07		mg/kg
1,3-Dichlorobenzene	<3.07		mg/kg
1,3-Dinitrobenzene	<3.07		mg/kg
1,4-Dichlorobenzene	<3.07		mg/kg
2,3,4,6-Tetrachlorophenol	<3.07		mg/kg
2,4,5-Trichlorophenol	<3.07		mg/kg
2,4,6-Trichlorophenol	<3.07		mg/kg
2,4-Dichlorophenol	<3.07		mg/kg
2,4-Dimethylphenol	<3.07		mg/kg
2,4-Dinitrophenol	<15.3		mg/kg
2,4-Dinitrotoluene	<3.07		mg/kg
2,6-Dichlorophenol	<3.07		mg/kg
2,6-Dinitrotoluene	<3.07		mg/kg
2-Acetylaminofluorene	<3.07		mg/kg
2-Chloronaphthalene	<3.07		mg/kg
2-Chlorophenol	<3.07		mg/kg
2-Methylphenol	<3.07		mg/kg
2-Nitroaniline	<3.07		mg/kg
2-Nitrophenol	<3.07		mg/kg
2-Picoline	<3.07		mg/kg
3-,4-methylphenol	<15.3		mg/kg
3,3'-Dichlorobenzidine	<15.3		mg/kg
4,6-Dinitro-2-methylphenol	<15.3		mg/kg
4-Bromophenyl-phenylether	<3.07		mg/kg
4-Chloro-3-methylphenol	<15.3		mg/kg
4-Chlorophenyl-phenylether	<3.07		mg/kg
4-Nitroaniline	<3.07		mg/kg
4-Nitrophenol	<15.3		mg/kg
7,12-Dimethylbenz[a]anthracene	<3.1		mg/kg
Acetophenone	<3.07		mg/kg
Aniline	<3.07		mg/kg
Benzyl Alcohol	<3.07		mg/kg
Butylbenzylphthalate	<3.07		mg/kg
Di-n-butylphthalate	<3.07		mg/kg
Di-n-octylphthalate	<3.07		mg/kg
Diethylphthalate	<3.07		mg/kg
Dimethylphthalate	<3.07		mg/kg
Dinoseb	<3.07		mg/kg
Diphenylamine	<3.07		mg/kg
Ethyl methanesulfonate	<3.07		mg/kg
Hexachlorobenzene	<3.07		mg/kg
Hexachlorobutadiene	<3.07		mg/kg
Hexachlorocyclopentadiene	<3.07		mg/kg
Hexachloroethane	<3.07		mg/kg
Hexachloropropene	<3.07		mg/kg
Isophorone	<3.07		mg/kg
Methyl methanesulfonate	<3.07		mg/kg
N-Nitroso-di-n-butylamine	<3.07		mg/kg
N-Nitroso-di-n-propylamine	<3.07		mg/kg
N-Nitrosomorpholine	<3.07		mg/kg
N-Nitrosopiperidine	<3.07		mg/kg
N-Nitrosopyrrolidine	<3.07		mg/kg
Nitrobenzene	<3.07		mg/kg
Pentachlorobenzene	<3.07		mg/kg
Pentachlorophenol	<15.3		mg/kg
Phenacetin	<3.07		mg/kg
Phenol	<3.07		mg/kg
Pronamide	<3.07		mg/kg
Safrole	<3.07		mg/kg
bis(2-Chloroethoxy)methane	<3.07		mg/kg
bis(2-Chloroethyl)ether	<3.07		mg/kg
bis(2-Chloroisopropyl)ether	<3.07		mg/kg
bis(2-Ethylhexyl)phthalate	<3.07		mg/kg
p-Dimethylaminoazobenzene	<3.07		mg/kg
PAH	**23-AUG-2016**		
1,4-Naphthoquinone	<3.07	73	mg/kg
2-Methylnaphthalene	<3.07	73	mg/kg
3-Methylcholanthrene	<3.07	73	mg/kg
Acenaphthene	<3.07	73	mg/kg
Acenaphthylene	<3.07	73	mg/kg
Anthracene	<3.07	73	mg/kg
Benzo(a)anthracene	<3.07	73	mg/kg
Benzo(a)pyrene	<3.07	73	mg/kg
Benzo(b)fluoranthene	<3.07	73	mg/kg
Benzo[g,h,i]perylene	<3.07	73	mg/kg
Benzo[k]fluoranthene	<3.07	73	mg/kg
Chrysene	<3.07	73	mg/kg
Dibenz[a,h]anthracene	<3.07	73	mg/kg
Dibenzofuran	<3.07	73	mg/kg
Fluoranthene	<3.07	73	mg/kg
Fluorene	<3.07	73	mg/kg
Indeno[1,2,3-cd]pyrene	<3.07	73	mg/kg
Naphthalene	<3.07	73	mg/kg
Phenanthrene	<3.07	73	mg/kg
Pyrene	<3.07	73	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
W03P31 ELK FORK NE OF RADCLIFF @ CO. RD. 43B			
OTHER	**15-AUG-2016**		
% Solids	66.4		percent
1,2,4,5-Tetrachlorobenzene	<2.3		mg/kg
1,2,4-Trichlorobenzene	<2.3		mg/kg
1,2-Dichlorobenzene	<2.3		mg/kg
1,3-Dichlorobenzene	<2.3		mg/kg
1,3-Dinitrobenzene	<2.3		mg/kg
1,4-Dichlorobenzene	<2.3		mg/kg
2,3,4,6-Tetrachlorophenol	<2.3		mg/kg
2,4,5-Trichlorophenol	<2.3		mg/kg
2,4,6-Trichlorophenol	<2.3		mg/kg
2,4-Dichlorophenol	<2.3		mg/kg
2,4-Dimethylphenol	<2.3		mg/kg
2,4-Dinitrophenol	<11.5		mg/kg
2,4-Dinitrotoluene	<2.3		mg/kg
2,6-Dichlorophenol	<2.3		mg/kg
2,6-Dinitrotoluene	<2.3		mg/kg
2-Acetylaminofluorene	<2.3		mg/kg
2-Chloronaphthalene	<2.3		mg/kg
2-Chlorophenol	<2.3		mg/kg
2-Methylphenol	<2.3		mg/kg
2-Nitroaniline	<2.3		mg/kg
2-Nitrophenol	<2.3		mg/kg
2-Picoline	<2.3		mg/kg
3-,4-methylphenol	<11.5		mg/kg
3,3'-Dichlorobenzidine	<11.5		mg/kg
4,6-Dinitro-2-methylphenol	<11.5		mg/kg
4-Bromophenyl-phenylether	<2.3		mg/kg
4-Chloro-3-methylphenol	<11.5		mg/kg
4-Chlorophenyl-phenylether	<2.3		mg/kg
4-Nitroaniline	<2.3		mg/kg
4-Nitrophenol	<11.5		mg/kg
7,12-Dimethylbenz[a]anthracene	<2.3		mg/kg
Acetophenone	<2.3		mg/kg
Aniline	<2.3		mg/kg
Benzyl Alcohol	<2.3		mg/kg
Butylbenzylphthalate	<2.3		mg/kg
Di-n-butylphthalate	<2.3		mg/kg
Di-n-octylphthalate	<2.3		mg/kg
Diethylphthalate	<2.3		mg/kg
Dimethylphthalate	<2.3		mg/kg
Dinoseb	<2.3		mg/kg
Diphenylamine	<2.3		mg/kg
Ethyl methanesulfonate	<2.3		mg/kg
Hexachlorobenzene	<2.3		mg/kg
Hexachlorobutadiene	<2.3		mg/kg
Hexachlorocyclopentadiene	<2.3		mg/kg
Hexachloroethane	<2.3		mg/kg
Hexachloropropene	<2.3		mg/kg
Isophorone	<2.3		mg/kg
Methyl methanesulfonate	<2.3		mg/kg
N-Nitroso-di-n-butylamine	<2.3		mg/kg
N-Nitroso-di-n-propylamine	<2.3		mg/kg
N-Nitrosomorpholine	<2.3		mg/kg
N-Nitrosopiperidine	<2.3		mg/kg
N-Nitrosopyrrolidine	<2.3		mg/kg
Nitrobenzene	<2.3		mg/kg
Pentachlorobenzene	<2.3		mg/kg
Pentachlorophenol	<11.5		mg/kg
Phenacetin	<2.3		mg/kg
Phenol	<2.3		mg/kg
Pronamide	<2.3		mg/kg
Safrole	<2.3		mg/kg
bis(2-Chloroethoxy)methane	<2.3		mg/kg
bis(2-Chloroethyl)ether	<2.3		mg/kg
bis(2-Chloroisopropyl)ether	<2.3		mg/kg
bis(2-Ethylhexyl)phthalate	<2.3		mg/kg
p-Dimethylaminoazobenzene	<2.3		mg/kg
PAH	**15-AUG-2016**		
1,4-Naphthoquinone	<2.3	105	mg/kg
2-Methylnaphthalene	<2.3	105	mg/kg
3-Methylcholanthrene	<2.3	105	mg/kg
Acenaphthene	<2.3	105	mg/kg
Acenaphthylene	<2.3	105	mg/kg
Anthracene	<2.3	105	mg/kg
Benzo(a)anthracene	<2.3	105	mg/kg
Benzo(a)pyrene	<2.3	105	mg/kg
Benzo(b)fluoranthene	<2.3	105	mg/kg
Benzo[g,h,i]perylene	<2.3	105	mg/kg
Benzo[k]fluoranthene	<2.3	105	mg/kg
Chrysene	<2.3	105	mg/kg
Dibenz[a,h]anthracene	<2.3	105	mg/kg
Dibenzofuran	<2.3	105	mg/kg
Fluoranthene	<2.3	105	mg/kg
Fluorene	<2.3	105	mg/kg
Indeno[1,2,3-cd]pyrene	<2.3	105	mg/kg
Naphthalene	<2.3	105	mg/kg
Phenanthrene	<2.3	105	mg/kg
Pyrene	<2.3	105	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units
W03S06 L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.			
OTHER	**23-AUG-2016**		
% Solids	51.8		percent
1,2,4,5-Tetrachlorobenzene	<2.95		mg/kg
1,2,4-Trichlorobenzene	<2.95		mg/kg
1,2-Dichlorobenzene	<2.95		mg/kg
1,3-Dichlorobenzene	<2.95		mg/kg
1,3-Dinitrobenzene	<2.95		mg/kg
1,4-Dichlorobenzene	<2.95		mg/kg
2,3,4,6-Tetrachlorophenol	<2.95		mg/kg
2,4,5-Trichlorophenol	<2.95		mg/kg
2,4,6-Trichlorophenol	<2.95		mg/kg
2,4-Dichlorophenol	<2.95		mg/kg
2,4-Dimethylphenol	<2.95		mg/kg
2,4-Dinitrophenol	<14.8		mg/kg
2,4-Dinitrotoluene	<2.95		mg/kg
2,6-Dichlorophenol	<2.95		mg/kg
2,6-Dinitrotoluene	<2.95		mg/kg
2-Acetylaminofluorene	<2.95		mg/kg
2-Chloronaphthalene	<2.95		mg/kg
2-Chlorophenol	<2.95		mg/kg
2-Methylphenol	<2.95		mg/kg
2-Nitroaniline	<2.95		mg/kg
2-Nitrophenol	<2.95		mg/kg
2-Picoline	<2.95		mg/kg
3-,4-methylphenol	<14.8		mg/kg
3,3'-Dichlorobenzidine	<14.8		mg/kg
4,6-Dinitro-2-methylphenol	<14.8		mg/kg
4-Bromophenyl-phenylether	<2.95		mg/kg
4-Chloro-3-methylphenol	<14.8		mg/kg
4-Chlorophenyl-phenylether	<2.95		mg/kg
4-Nitroaniline	<2.95		mg/kg
4-Nitrophenol	<14.8		mg/kg
7,12-Dimethylbenz[a]anthracene	<3		mg/kg
Acetophenone	<2.95		mg/kg
Aniline	<2.95		mg/kg
Benzyl Alcohol	<2.95		mg/kg
Butylbenzylphthalate	<2.95		mg/kg
Di-n-butylphthalate	<2.95		mg/kg
Di-n-octylphthalate	<2.95		mg/kg
Diethylphthalate	<2.95		mg/kg
Dimethylphthalate	<2.95		mg/kg
Dinoseb	<2.95		mg/kg
Diphenylamine	<2.95		mg/kg
Ethyl methanesulfonate	<2.95		mg/kg
Hexachlorobenzene	<2.95		mg/kg
Hexachlorobutadiene	<2.95		mg/kg
Hexachlorocyclopentadiene	<2.95		mg/kg
Hexachloroethane	<2.95		mg/kg
Hexachloropropene	<2.95		mg/kg
Isophorone	<2.95		mg/kg
Methyl methanesulfonate	<2.95		mg/kg
N-Nitroso-di-n-butylamine	<2.95		mg/kg
N-Nitroso-di-n-propylamine	<2.95		mg/kg
N-Nitrosomorpholine	<2.95		mg/kg
N-Nitrosopiperidine	<2.95		mg/kg
N-Nitrosopyrrolidine	<2.95		mg/kg
Nitrobenzene	<2.95		mg/kg
Pentachlorobenzene	<2.95		mg/kg
Pentachlorophenol	<14.8		mg/kg
Phenacetin	<2.95		mg/kg
Phenol	<2.95		mg/kg
Pronamide	<2.95		mg/kg
Safrole	<2.95		mg/kg
bis(2-Chloroethoxy)methane	<2.95		mg/kg
bis(2-Chloroethyl)ether	<2.95		mg/kg
bis(2-Chloroisopropyl)ether	<2.95		mg/kg
bis(2-Ethylhexyl)phthalate	<2.95		mg/kg
p-Dimethylaminoazobenzene	<2.95		mg/kg
PAH	**23-AUG-2016**		
1,4-Naphthoquinone	<2.95	67	mg/kg
2-Methylnaphthalene	<2.95	67	mg/kg
3-Methylcholanthrene	<2.95	67	mg/kg
Acenaphthene	<2.95	67	mg/kg
Acenaphthylene	<2.95	67	mg/kg
Anthracene	<2.95	67	mg/kg
Benzo(a)anthracene	<2.95	67	mg/kg
Benzo(a)pyrene	<2.95	67	mg/kg
Benzo(b)fluoranthene	<2.95	67	mg/kg
Benzo[g,h,i]perylene	<2.95	67	mg/kg
Benzo[k]fluoranthene	<2.95	67	mg/kg
Chrysene	<2.95	67	mg/kg
Dibenz[a,h]anthracene	<2.95	67	mg/kg
Dibenzofuran	<2.95	67	mg/kg
Fluoranthene	<2.95	67	mg/kg
Fluorene	<2.95	67	mg/kg
Indeno[1,2,3-cd]pyrene	<2.95	67	mg/kg
Naphthalene	<2.95	67	mg/kg
Phenanthrene	<2.95	67	mg/kg
Pyrene	<2.95	67	mg/kg

Appendix Table 4. Organic parameters from sediment samples collected during the 2016 Raccoon Creek survey.

PARAMETER	RESULT	normalized PAH	Units	PARAMETER	RESULT	normalized PAH	Units

i Deteced in Blank; o Exceeds Calibration; ¿ QC Criteria Not Met; 1 Invalid Colony Count; ¥ CoAnalyeCorrelation; £ Matrix Interference; ªEstimatedValue; ¯Holding/Shipping Time Exceeded; ¤ PesticideGCDiff

Appendix K — Water Quality Sonde Results

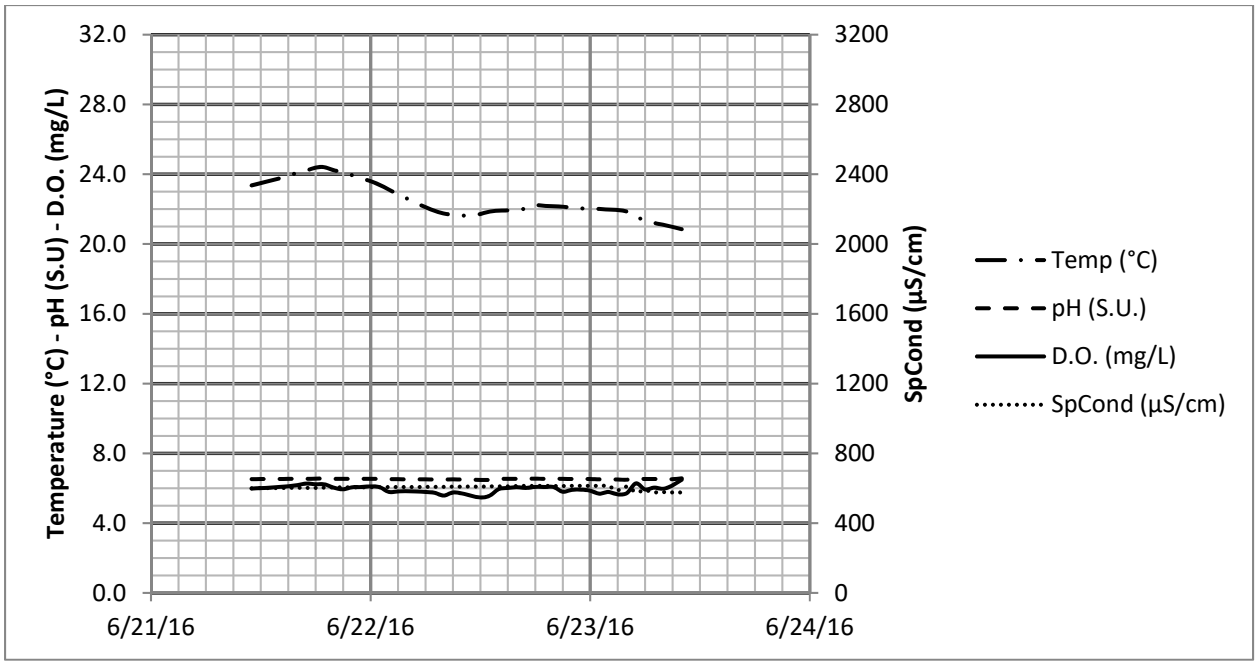

Figure 1: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 111.4; STORET: 301747). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

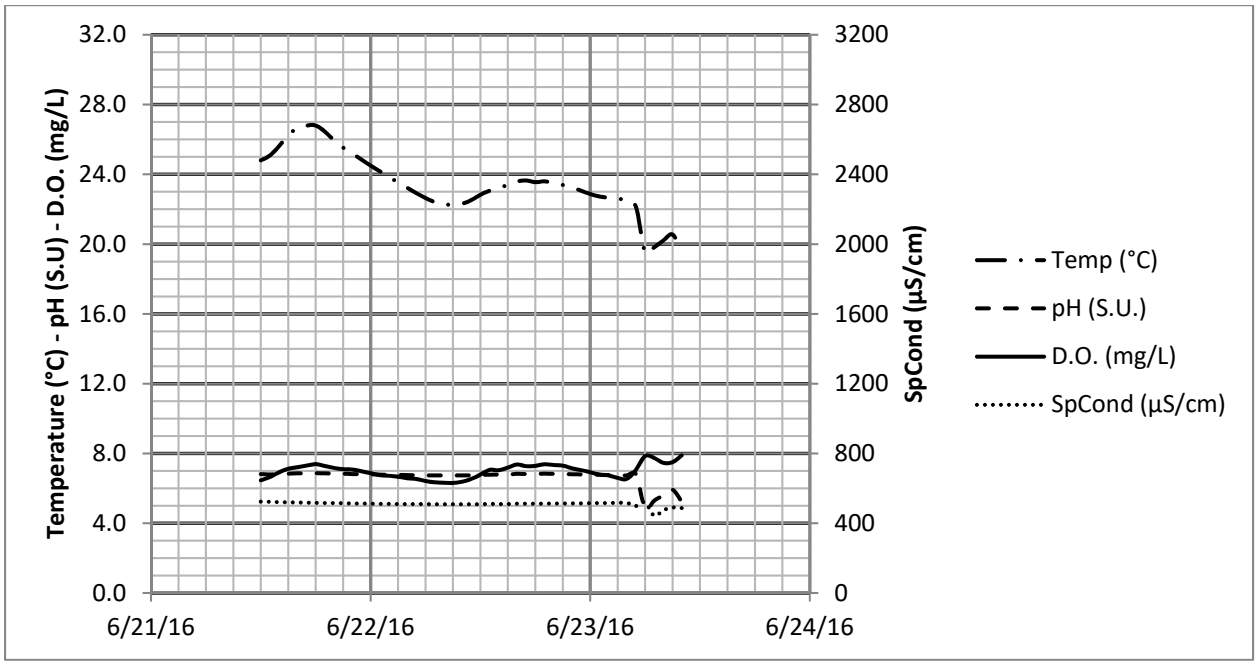

Figure 2: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 104.6; STORET: 301746). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

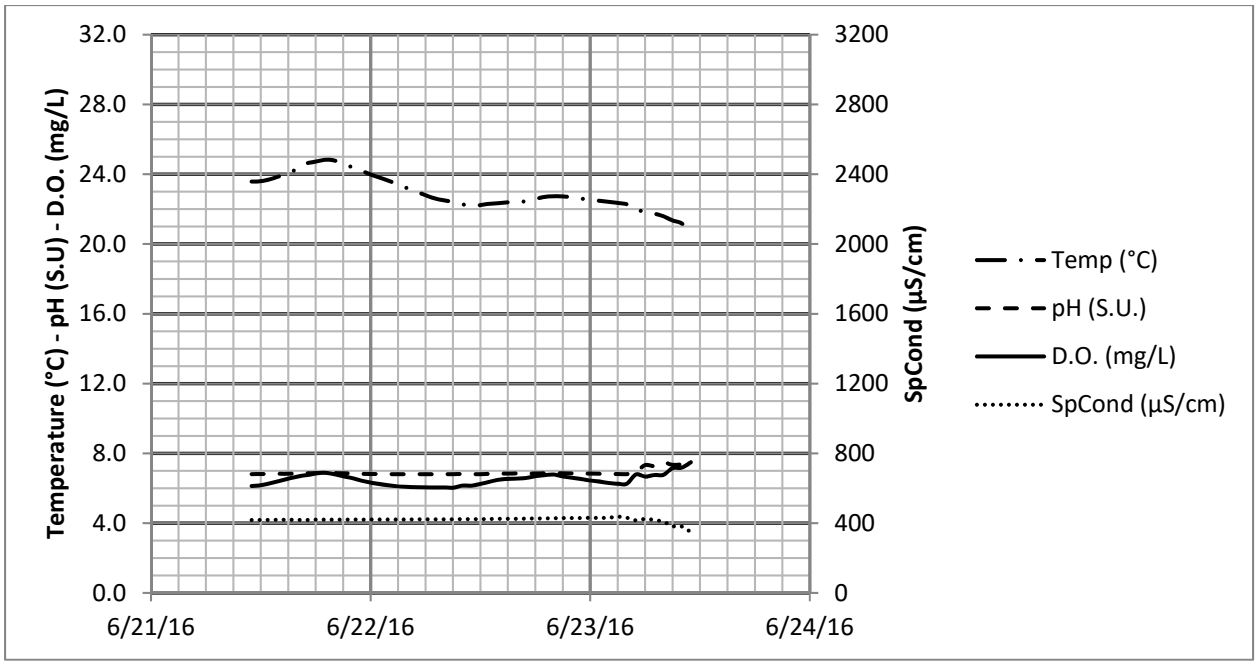

Figure 3: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 89.36; STORET: 302519). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

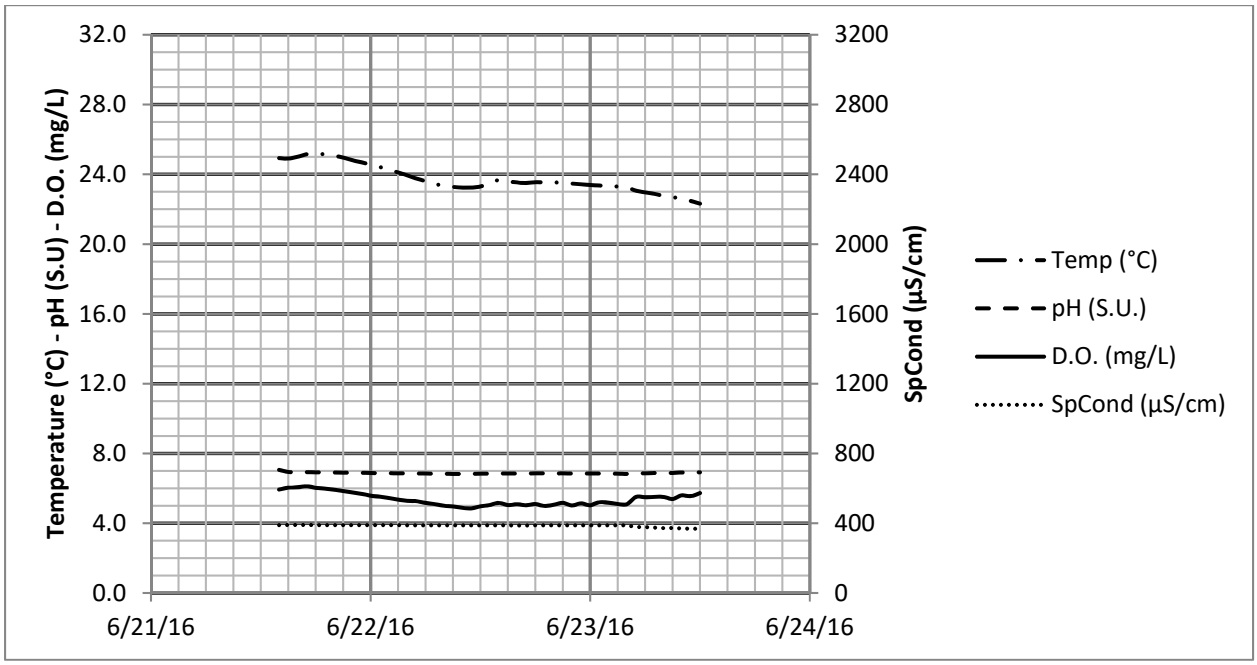

Figure 4: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 80.62; STORET: W03G50). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

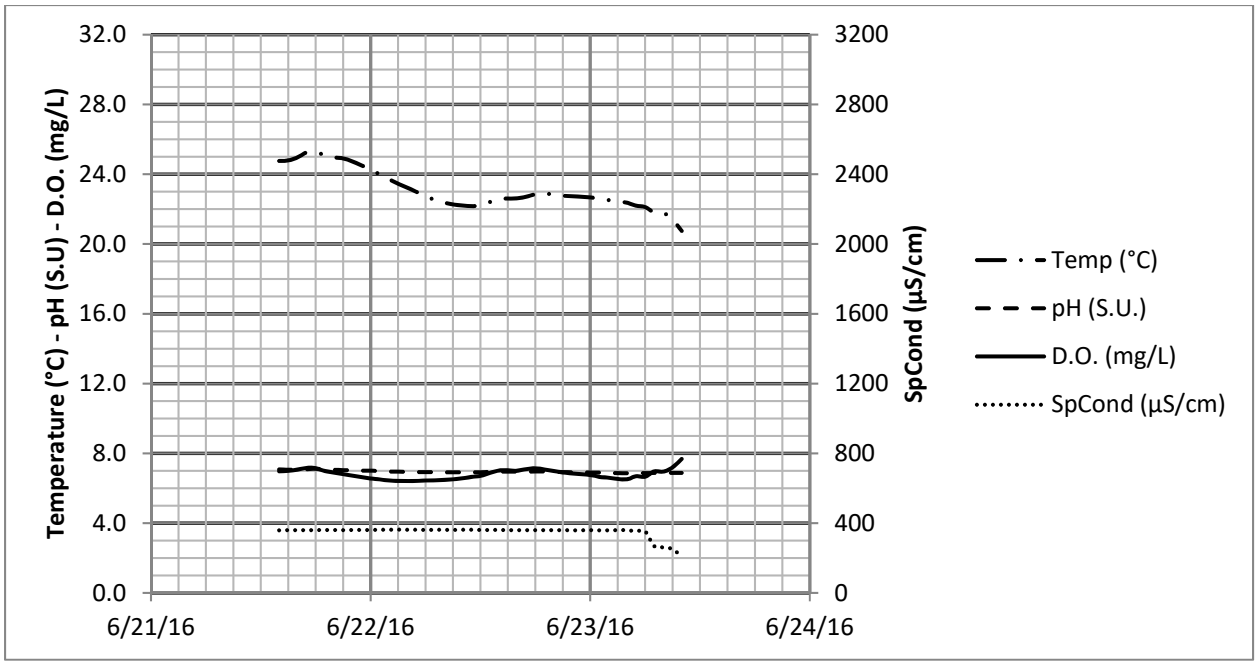

Figure 5: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 63.8; STORET: W03W35). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

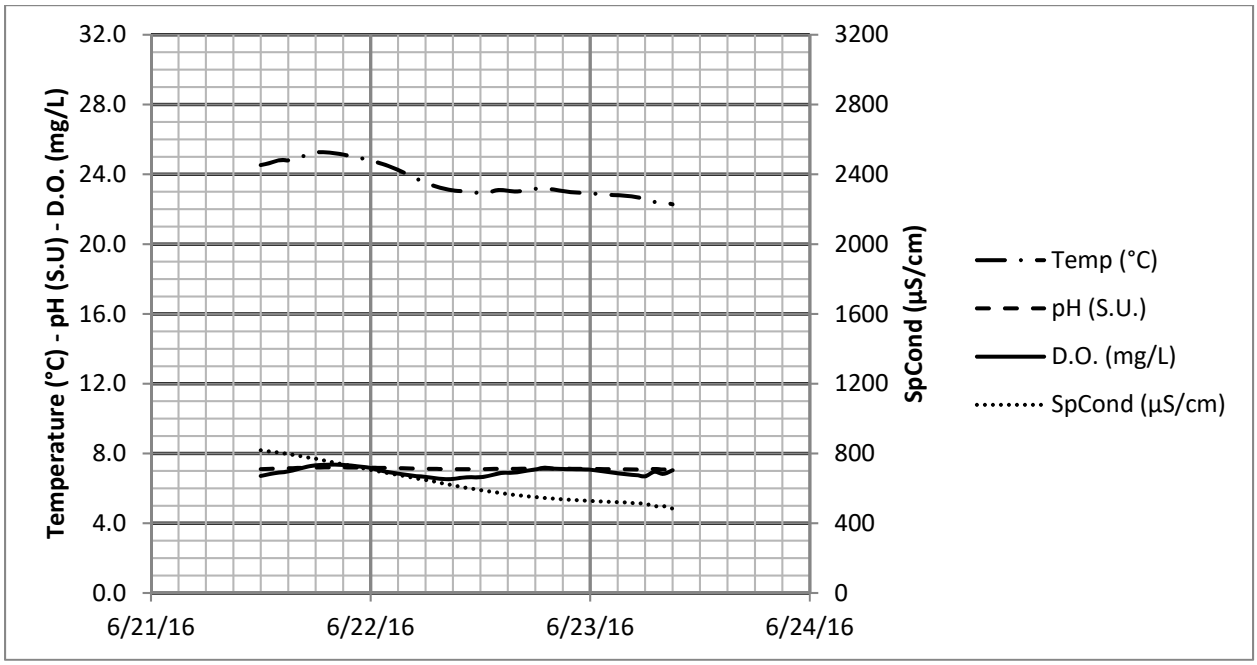

Figure 6: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 50.1; STORET: W03S34). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

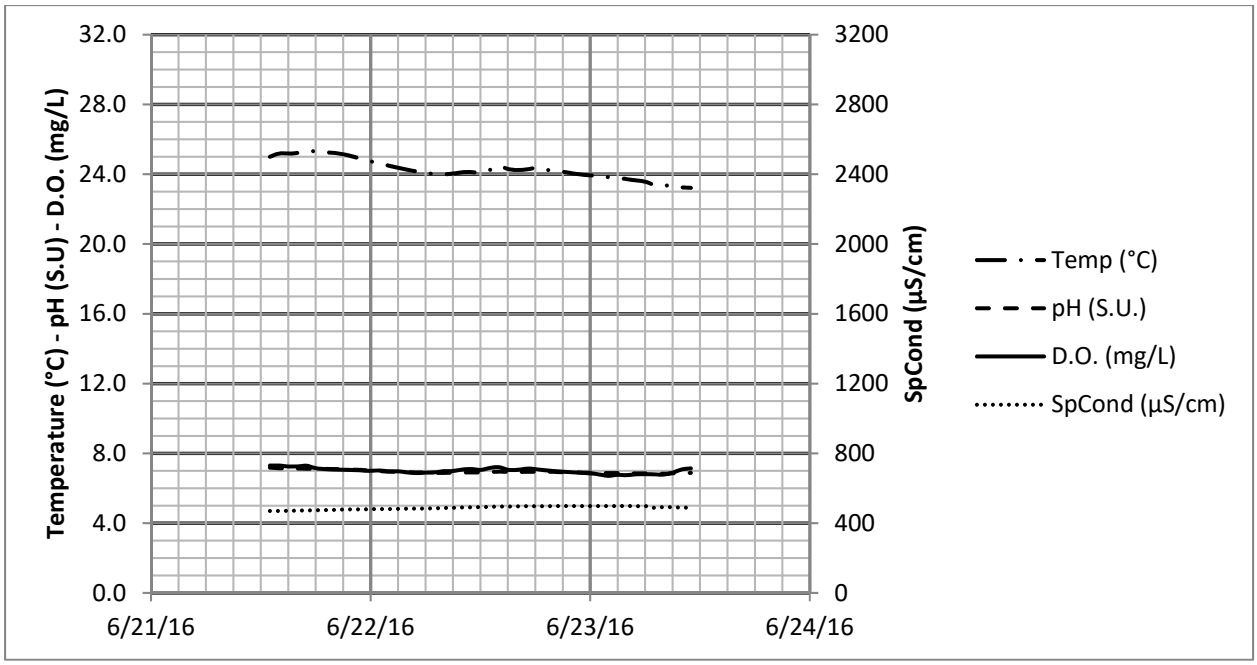

Figure 7: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 40.0; STORET: W03P05). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

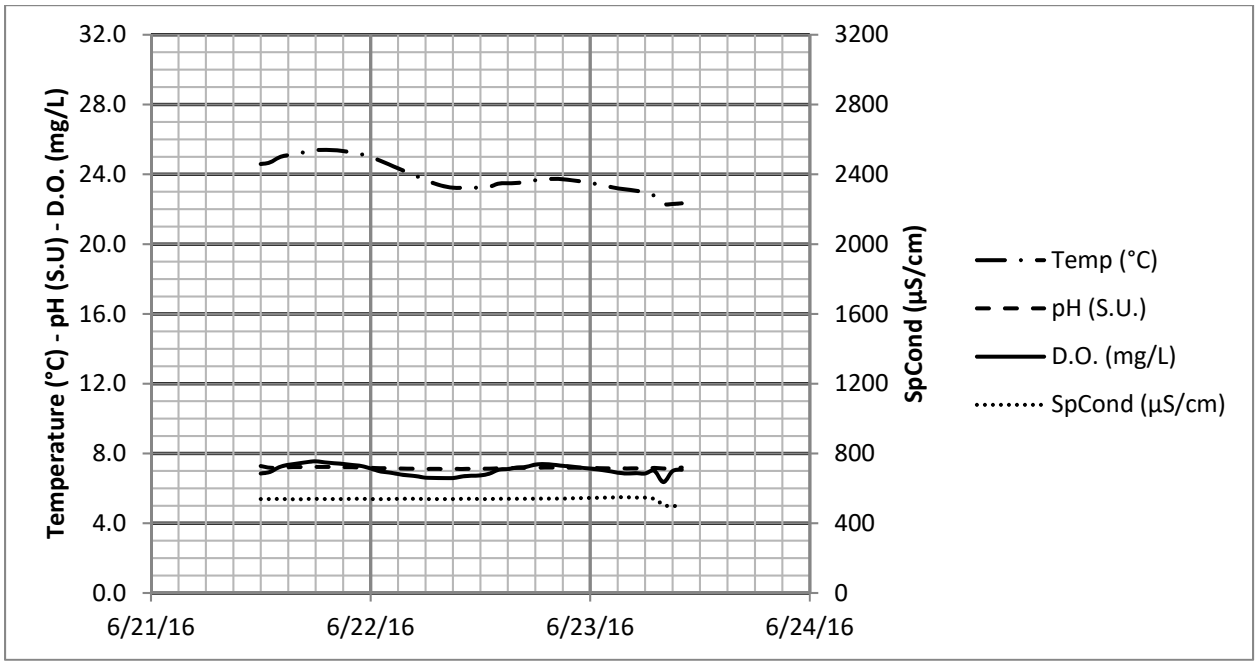

Figure 8: Plot of hourly data collected with a water quality sonde on Raccoon Creek (RM 29.2; STORET: 601400). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

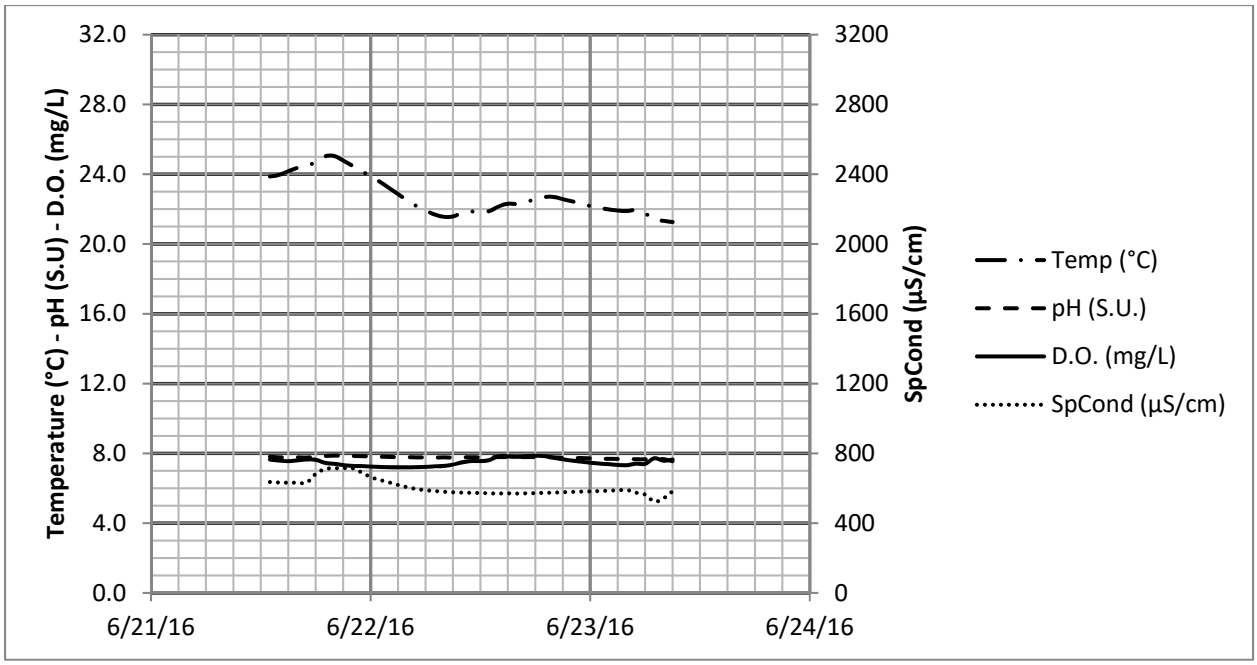

Figure 9: Plot of hourly data collected with a water quality sonde on Bullskin Creek (RM 0.4; STORET: W03K21). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

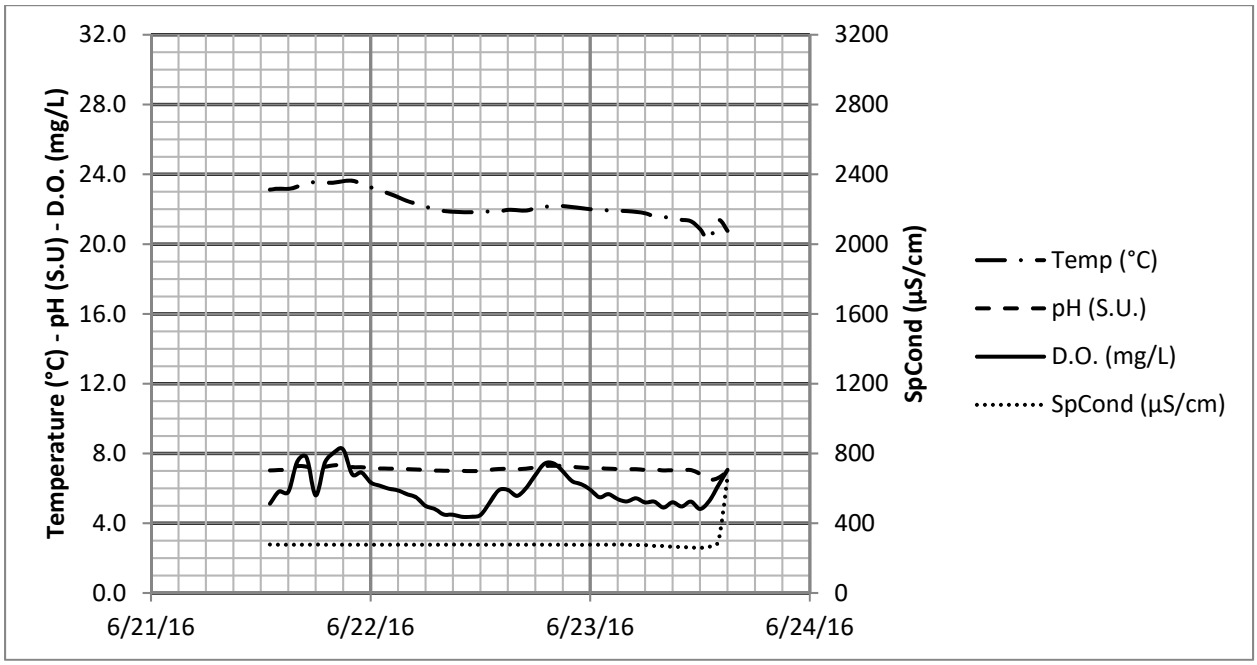

Figure 10: Plot of hourly data collected with a water quality sonde on Little Raccoon Creek (RM 27.9; STORET: W03S07). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

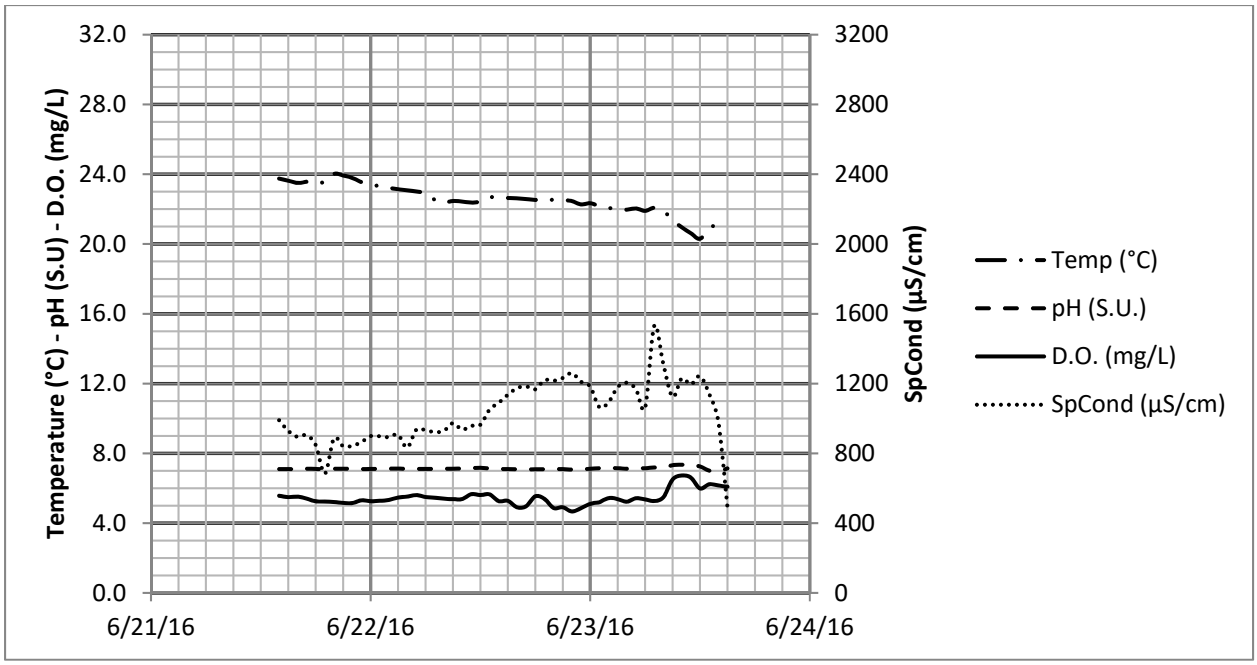

Figure 11: Plot of hourly data collected with a water quality sonde on Little Raccoon Creek (RM 24.6; STORET: W03W25). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

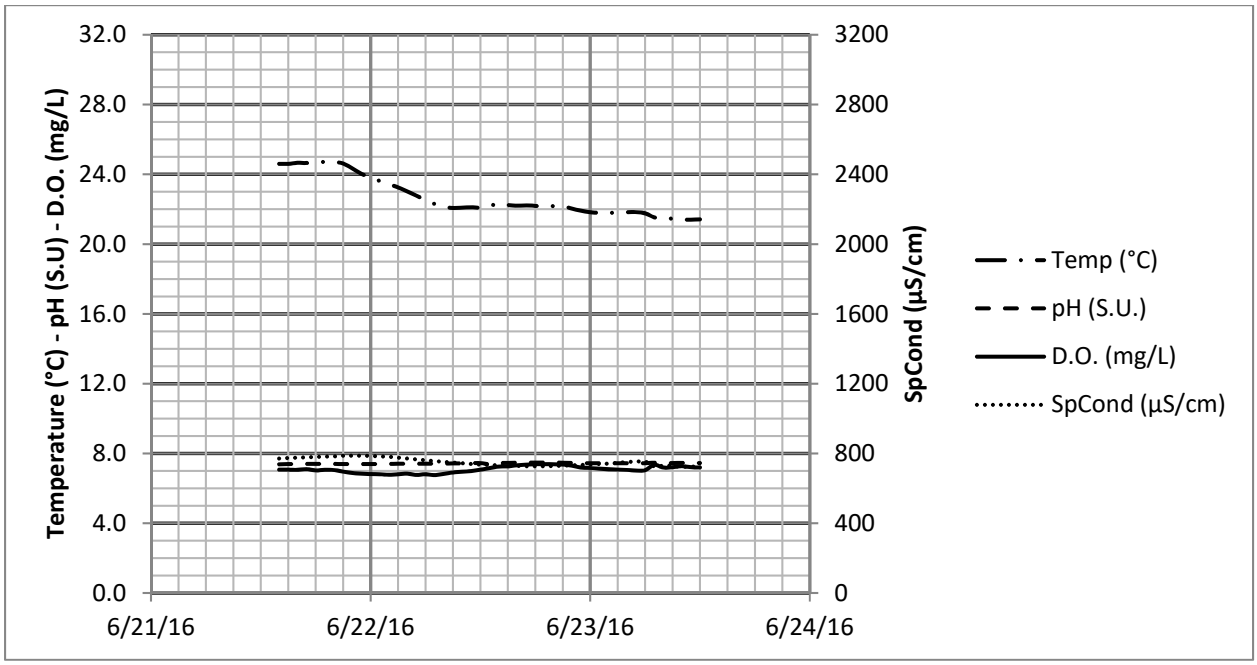

Figure 12: Plot of hourly data collected with a water quality sonde on Little Raccoon Creek (RM 12.71; STORET: W03S06). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

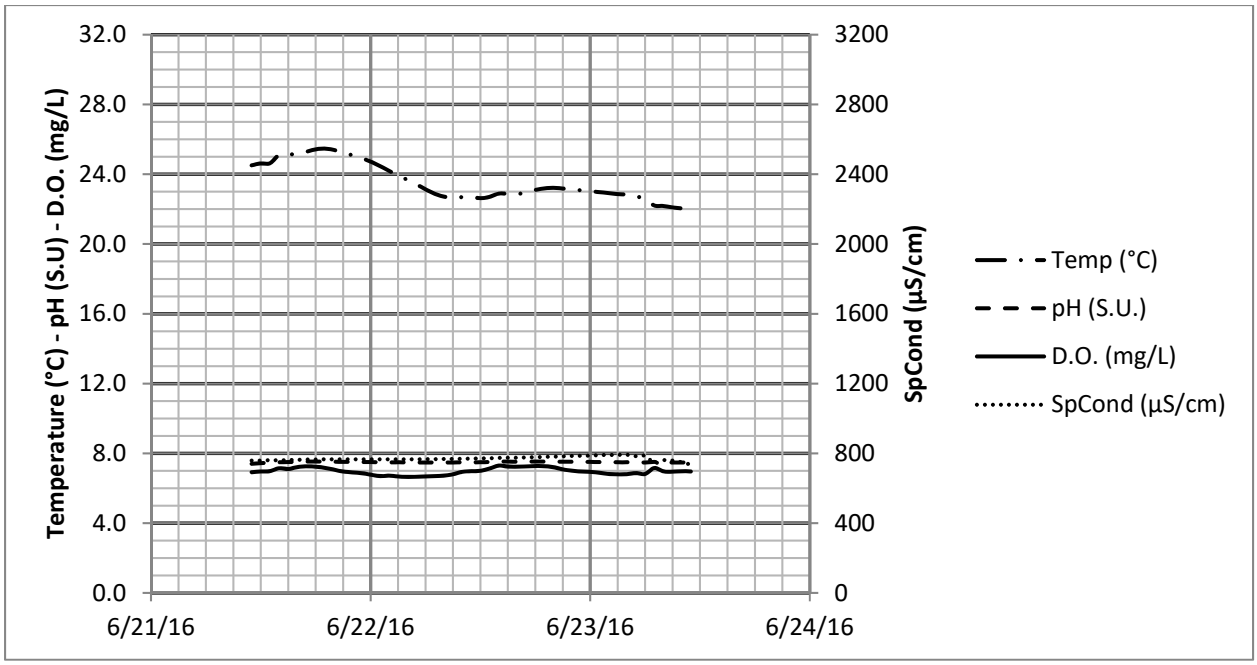

Figure 13: Plot of hourly data collected with a water quality sonde on Little Raccoon Creek (RM 1.2; STORET: W03P04). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

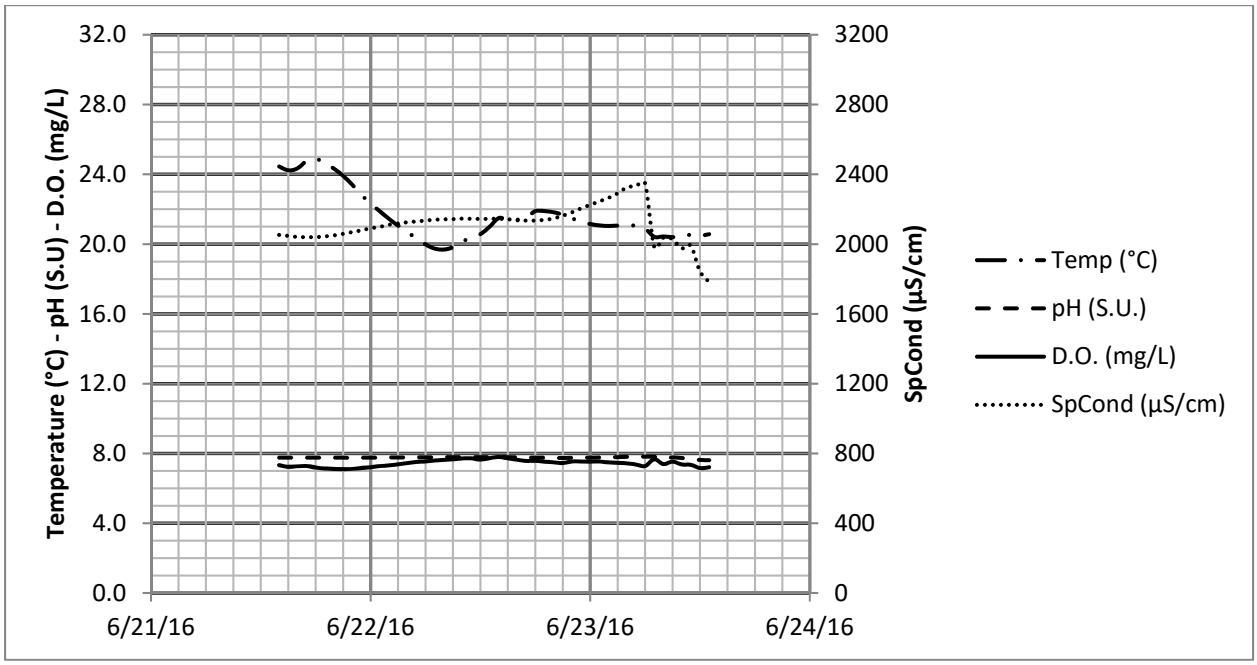

Figure 14: Plot of hourly data collected with a water quality sonde on Dickason Run (RM 0.1; STORET: W03P43). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

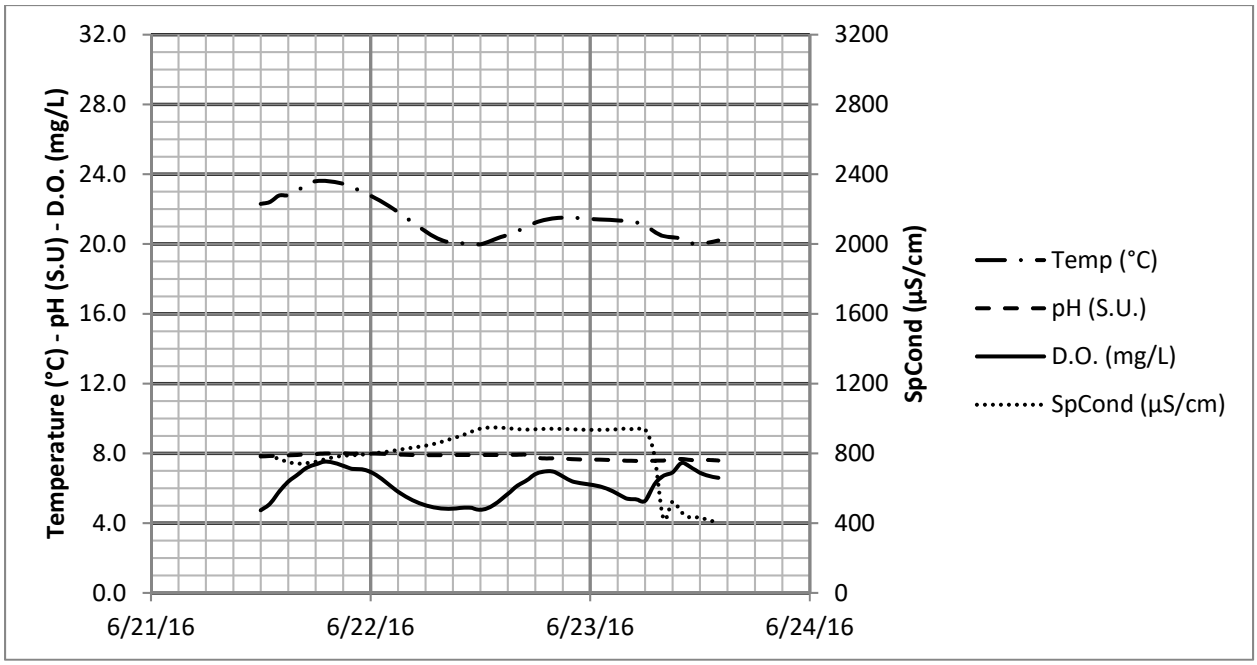

Figure 15: Plot of hourly data collected with a water quality sonde on Meadow Run (RM 0.7; STORET: W03W18). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

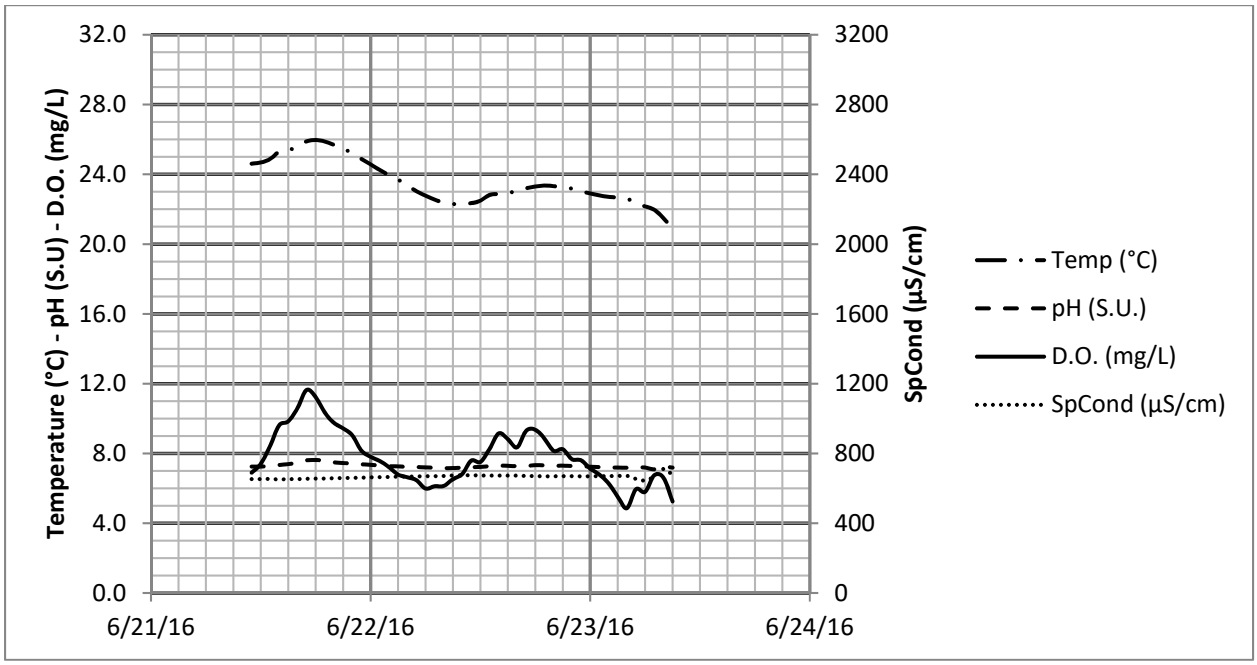

Figure 16: Plot of hourly data collected with a water quality sonde on Elk Fork (RM 13.3; STORET: W03P30). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

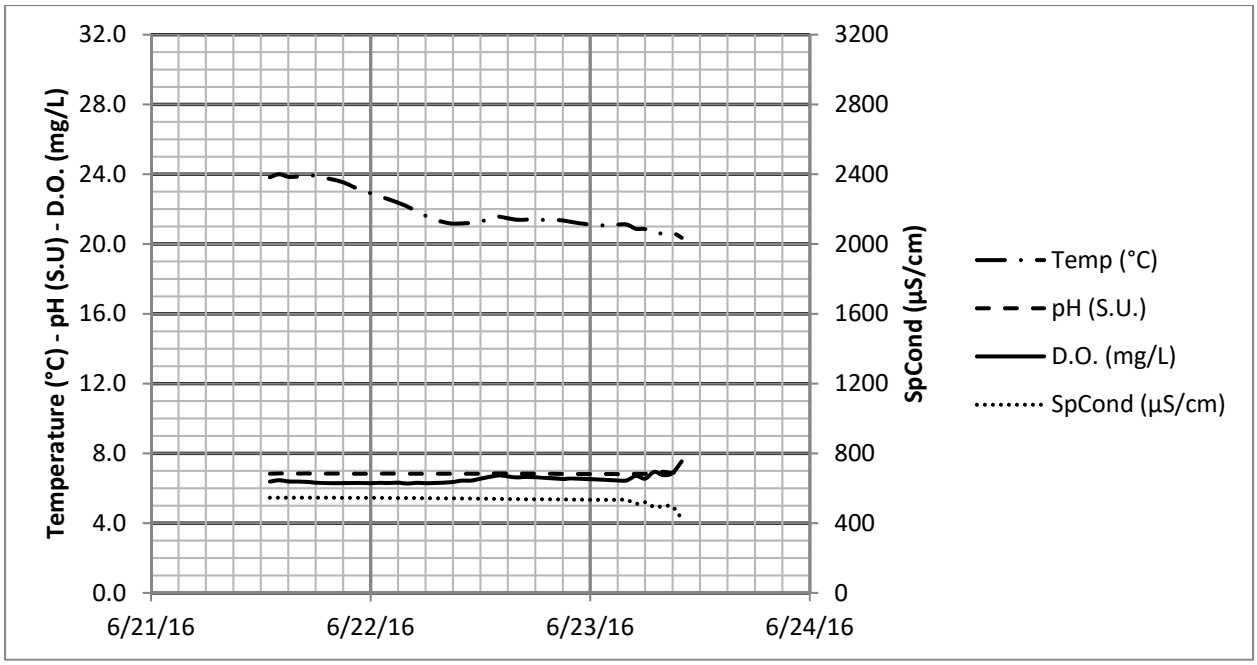

Figure 17: Plot of hourly data collected with a water quality sonde on Elk Fork (RM 0.01; STORET: W03P31). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

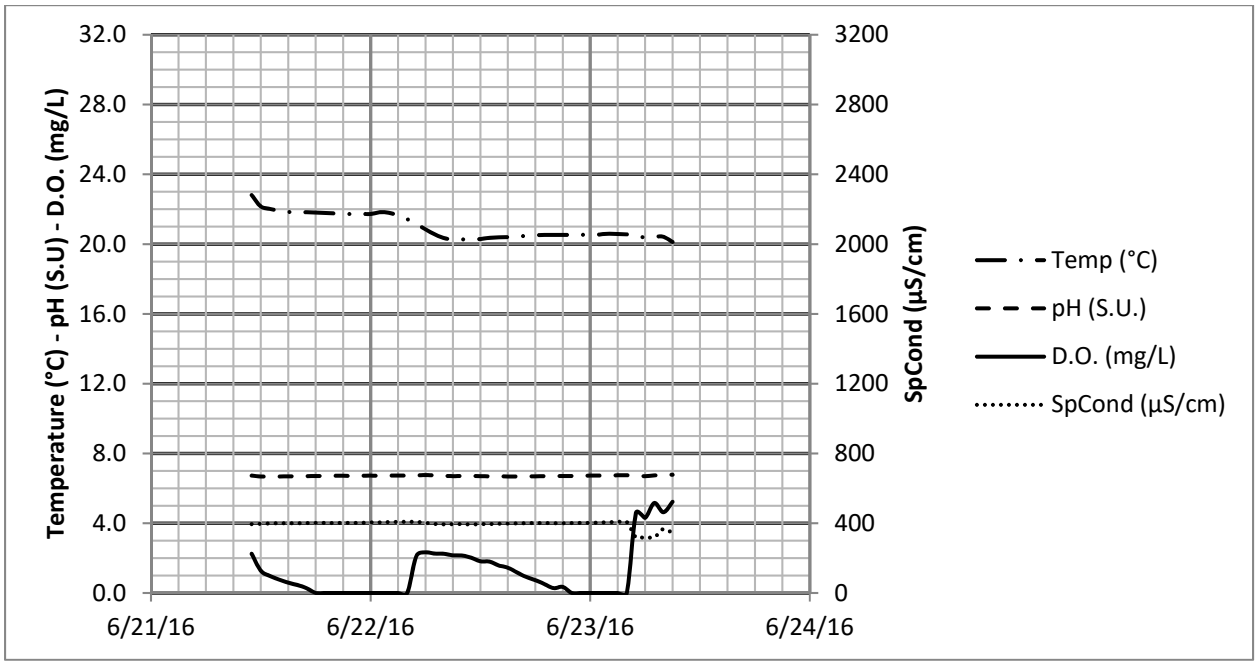

Figure 18: Plot of hourly data collected with a water quality sonde on Wolf Run (RM 3.8; STORET: 203947). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

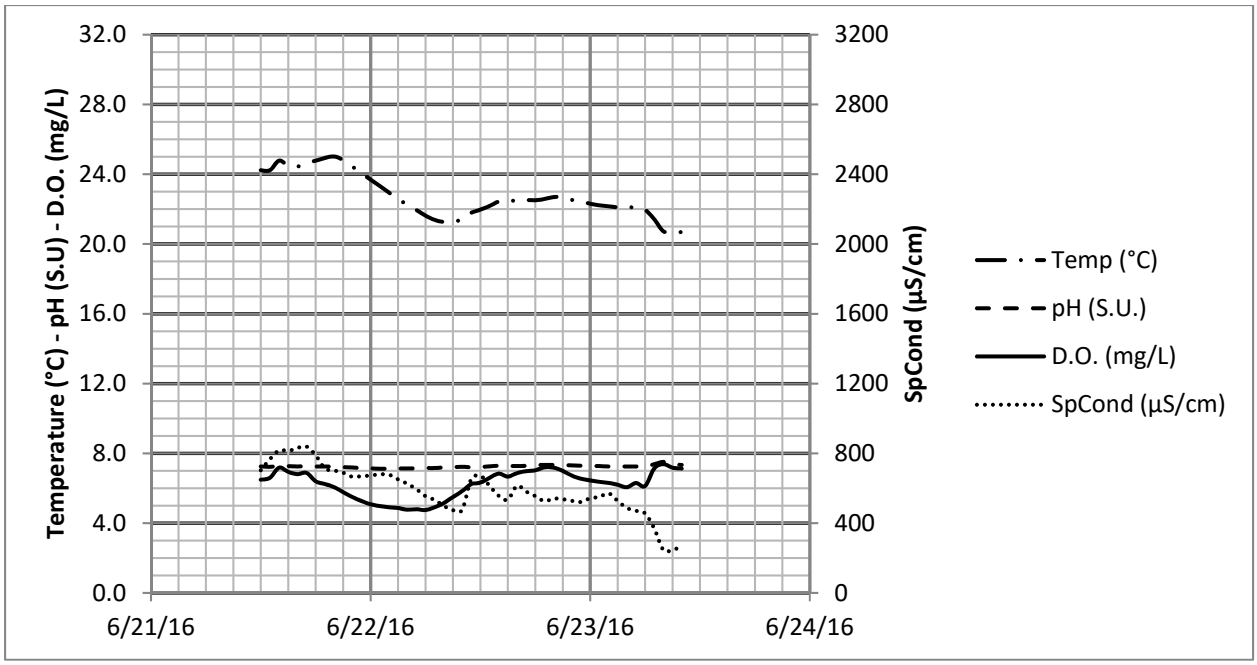

Figure 19: Plot of hourly data collected with a water quality sonde on Indian Creek (RM 1.4; STORET: W03W55). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

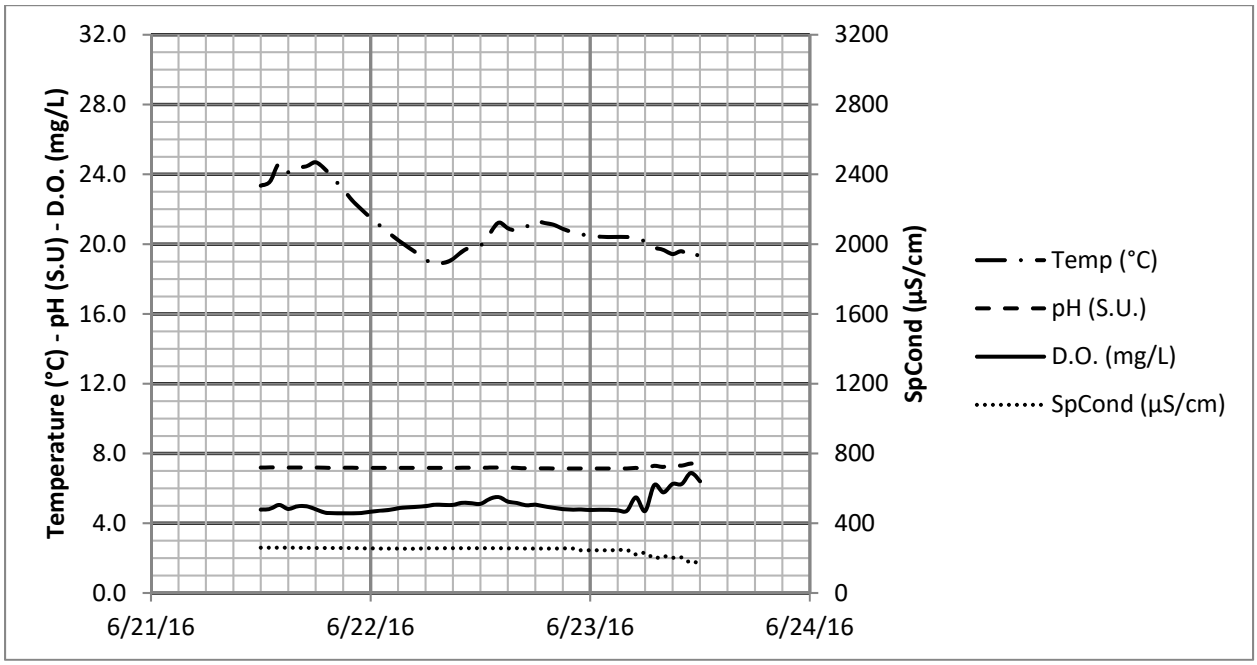

Figure 20: Plot of hourly data collected with a water quality sonde on Strongs Run (RM 0.6; STORET: W03S47). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

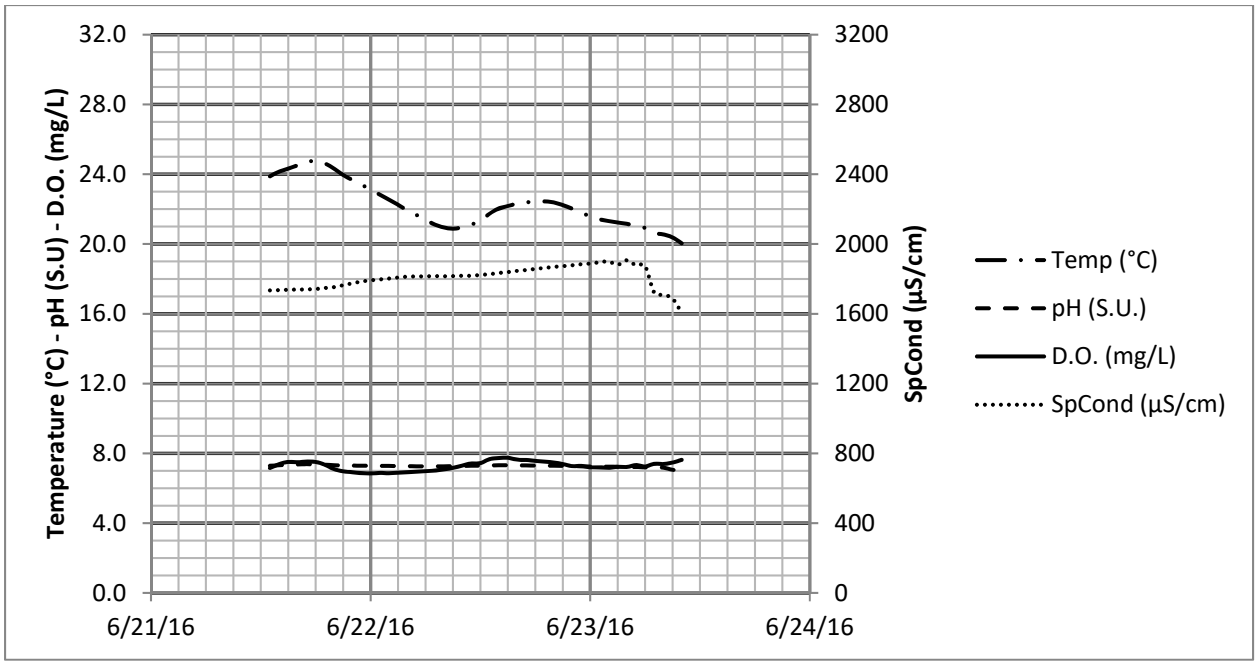

Figure 21: Plot of hourly data collected with a water quality sonde on Pierce Run (RM 1.7; STORET: W03W47). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

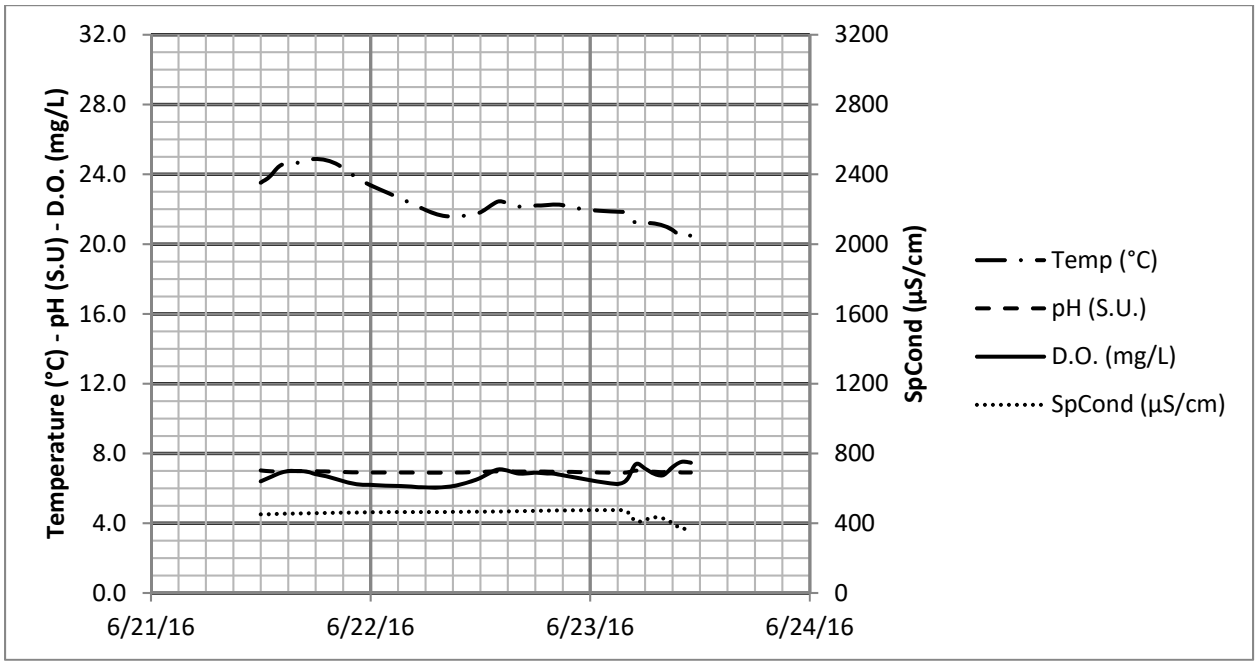

Figure 22: Plot of hourly data collected with a water quality sonde on Hewett Fork (RM 0.1; STORET: W03P32). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

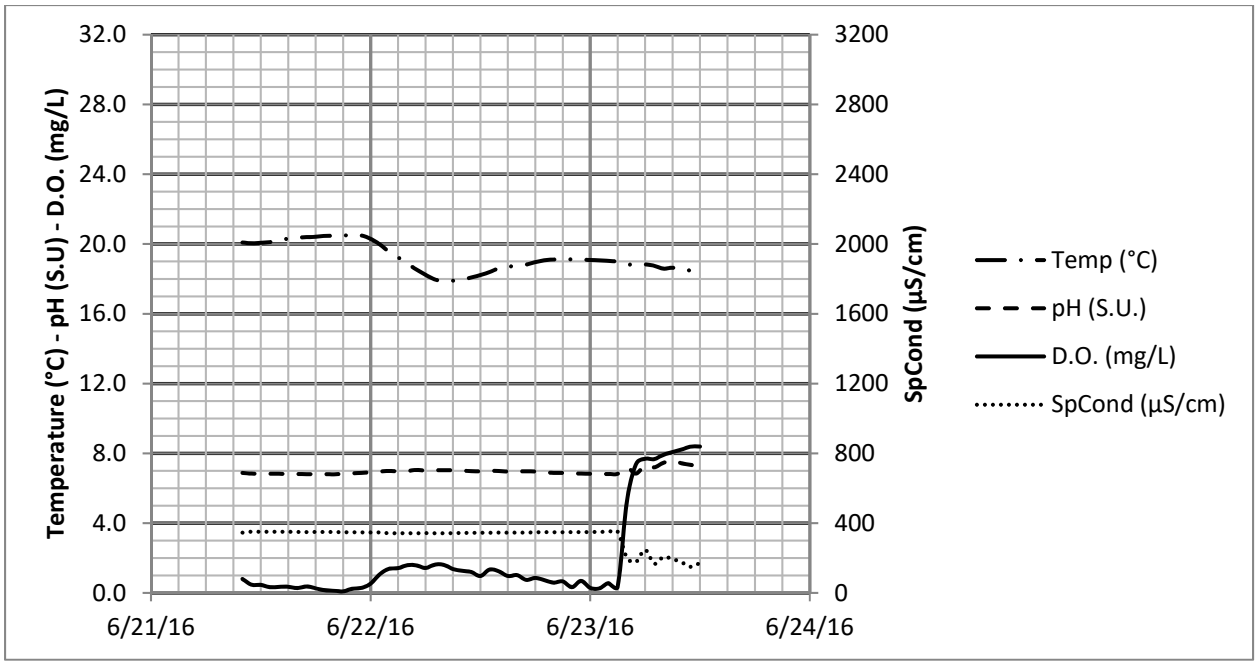

Figure 23: Plot of hourly data collected with a water quality sonde on Grass Run (RM 0.1; STORET: W03P41). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

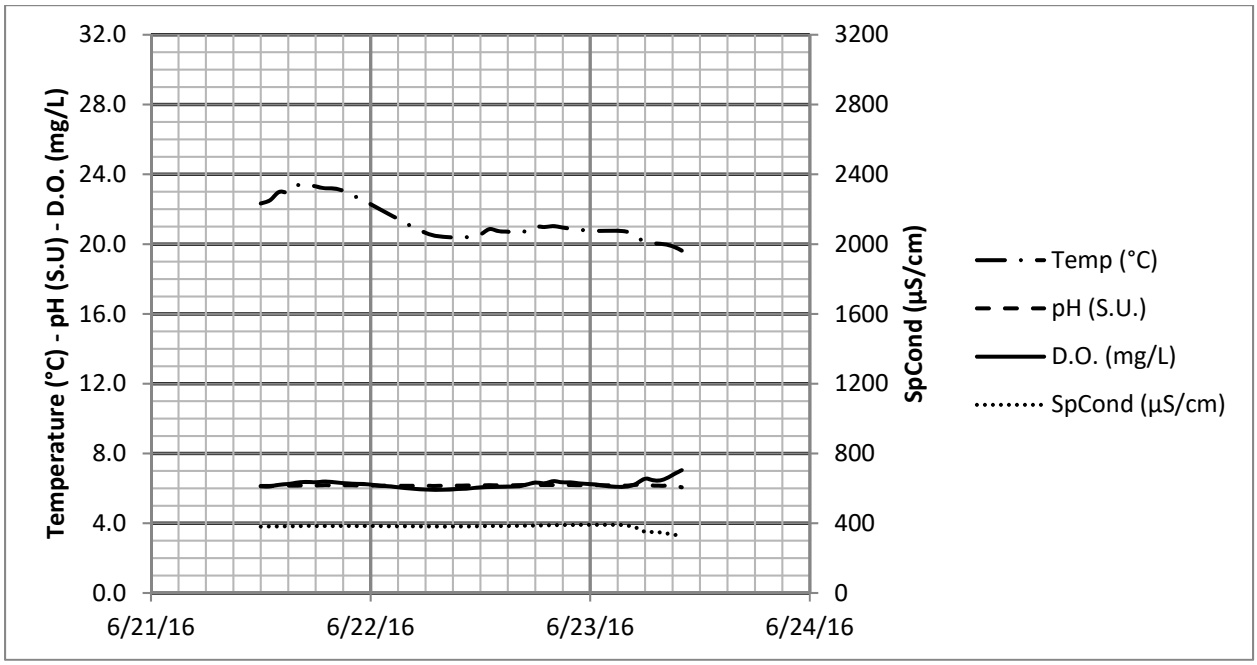

Figure 24: Plot of hourly data collected with a water quality sonde on Brushy Fork (RM 0.36; STORET: W03K39). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

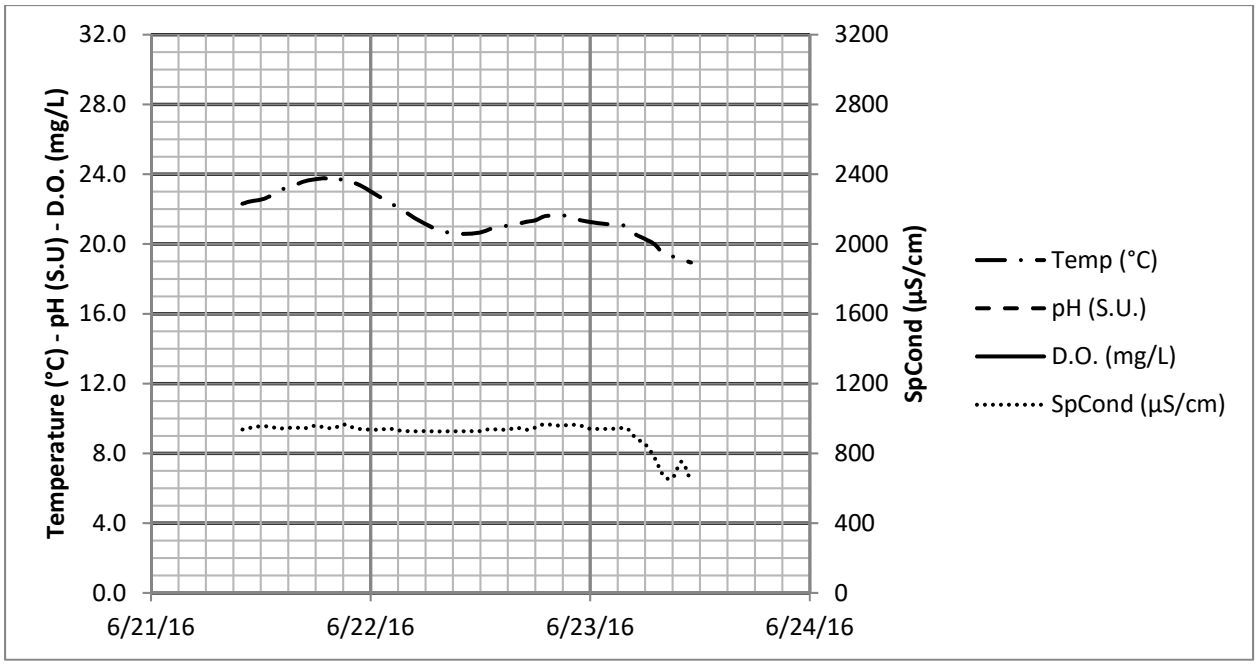

Figure 25: Plot of hourly data collected with a water quality sonde on East Branch Raccoon Creek (RM 2.1; STORET: W03K17). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

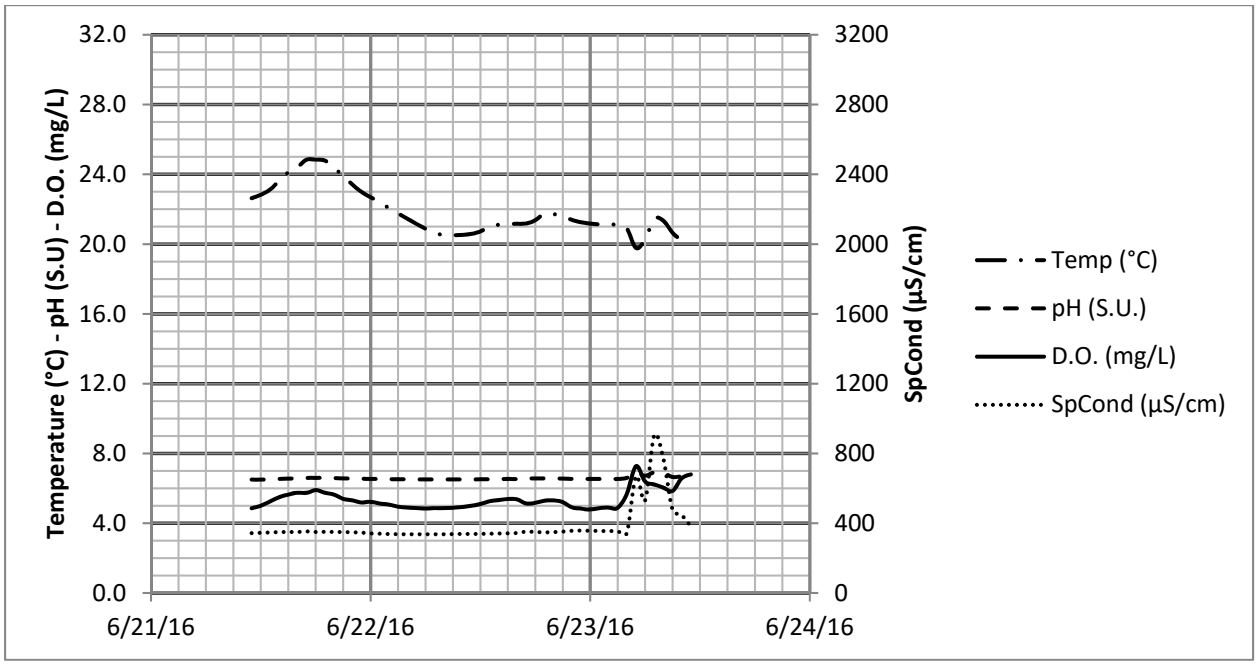

Figure 26: Plot of hourly data collected with a water quality sonde on West Branch Raccoon Creek (RM 0.15; STORET: W03W43). Temperature (°C), D.O. (mg/L), pH (S.U.) and specific conductance (µS/cm) are included. The data was collected from 6/21-23/2016.

Appendix L — Surface Water Bacteriological Results

Appendix Table L. Surface water bacterialogical (*E. coli*) results from the Raccoon Creek watershed 2016. All values are expressed in colony forming units (cfu) per 100 ml of water.

River Code	Station Name	Station	RM	6-Jun	7-Jun	8-Jun	13-Jun	21-Jun	23-Jun	27-Jun	30-Jun	5-Jul	6-Jul	7-Jul	14-Jul	18-Jul	19-Jul	20-Jul	27-Jul	1-Aug	2-Aug	11-Aug	16-Aug	17-Aug	18-Aug
09-500-000	**RACCOON CREEK DST. EAST/WEST BRANCHES @ ST. RT. 328**	301747	111.38			770	660		4800	140 JL			310		620		1200 JL			240	200	200			470
09-500-000	**RACCOON CREEK W OF ZALESKI @ ST. RT. 677**	W03W32	99.6			80 JL			5600					480				160 JL							11000 JL
09-500-000	**RACCOON CREEK DST. HEWETT FORK @ CO. RD. 18 B**	302519	89.36			60 JL	20 JL		890 JL	120 JL				90 JL	70 JL			10	50 JL	30 JL					80 JL
09-500-000	**RACCOON CREEK AT BOLINS MILLS @ ST. RT. 50**	W03G50	80.62		130 JL		60 JL		3100	310			120 JL		70 JL		400		200	50 JL					80 JL
09-500-000	**RACCOON CREEK S OF CLARION @ ST. RT. 124**	W03P18	55.48		110 JL		50 JL			110 JL	140 JL		150 JL		100 JL		130 JL		1300 JL	150 JL				110 JL	
09-500-000	**RACCOON CREEK AT VINTON @ ST. RT. 160**	W03P05	40.01			100 JL	110 JL		1300 JL	290			740		120 JL		240		10000 JL	340				240	
09-500-000	**RACCOON CREEK AT WOODS MILL @ EAGLE RD.**	W03S44	35.61		160 JL						240		630				240							330	
09-500-000	**RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35**	601400	29.2		240		270			390	250	41000			300	160 JL			33000	240				520	
09-500-000	**RACCOON CREEK ADJ. DAN JONES RD**	303503	22	1400 JL				10 JL				3100				2200							40000		
09-500-000	**RACCOON CREEK AT NORTHUP, DST. DAM**	W03S24	10.2	2000				60 JL				990 JL				300							160 JL		
09-500-000	**RACCOON CREEK NEAR THIVENER @ ST. RT. 218**	W03P16	5.36		1100 JL						160 JL		310				200							40 JL	
09-500-012	**BIG BEAVER CREEK AT GUTHRE RD. S. OF RIO GRANDE**	303508	0.9		1300 JL						380	3600				190 JL									
09-502-000	**BULLSKIN CREEK AT THIVENOR @ ST. RT. 218**	W03K21	0.37		630						570		900 JL				790							310	
09-507-000	**CLAYLICK RUN SW OF NORTHUP @ LINCLON PIKE**	203929	0.4		1100 JL						600		1400 JL				430							50 JL	
09-510-000	**L. RACCOON CREEK UPST. MEADOW RUN @ CO. RD. 39**	W03S07	27.9		140 JL						200		240				660							250	
09-510-000	**L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.**	W03S06	12.71			20 JL	50 JL		1600 JL	150 JL				100 JL	50 JL			60 JL		170 JL					280
09-510-000	**L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325**	W03P04	1.17		220						150 JL		260				160 JL							2300	
09-514-000	**DICKASON RUN NEAR KEYSTONE @ ORPHEUS-KEYSTONE RD.**	W03P43	0.11			140 JL			1100 JL					150 JL				190 JL							1000 JL
09-530-000	**ELK FORK 1 MI. E OF MCARTHUR @ ST. RT. 50**	W03P30	13.26			310			28000					960 JL				1100 JL							2500
09-530-000	**ELK FORK NE OF RADCLIFF @ CO. RD. 43B**	W03P31	0.01		150 JL		90 JL		6200	340			270		190 JL		230		160 JL	180 JL					390
09-539-000	**INDIAN CREEK UPST. RIO GRANDE WWTP @ ST. RT. 325**	W03P36	1.58		990 JL			830 JL				9300 JL				960 JL							60 JL		
09-542-000	**BARREN CREEK N OF HARRISBURG, NEAR MOUTH**	203953	0.3		1000 JL						260	44000				440								1200 JL	
09-546-000	**STRONGS RUN NE OF EWINGTON @ ADNEY RD.**	W03S47	0.58			1300 JL			76000					1300 JL				2100							350
09-553-000	**PIERCE RUN AT RADCLIFF @ TWP. RD. 2**	W03W47	1.68		130 JL				6200				150 JL				160 JL								320
09-563-000	**HEWETT FORK 1 MI SW OF MINERAL @ TWP. RD. 20**	W03P08	4.31			250			6900				380				250								290
09-571-000	**BRUSHY CREEK @ SR 328 NEAR MOUTH**	W03K39	0.36			220	160 JL		42000	350				410	310			560	560	180 JL					1700 JL
09-574-000	**E. BR. RACCOON CREEK ADJ. ST. RT. 56/328**	W03K17	2.1			140 JL			26000				270				520								520
09-575-000	**W. BR. RACCOON CREEK NEAR MOUTH @ ST. RT. 328**	W03W43	0.15			1100 JL			20000				590				2900								610

Appendix M — Statistical Methods

Statistical Methods for Ecological Data Analysis

Techniques to describe how biological assemblages relate to environmental and stressor gradients are well-established and have been made accessible by the combination of modern computing power, open-source software, and highly approachable books[1], guides[2] and online texts[3]. Ohio EPA's Division of Surface Water incorporates these techniques into making biological assessments and causal associations because these techniques help focus attention on likely causative stressors, eliminate spurious associations and generally provide a more complete picture of how assessed sites are arrayed against stressor gradients. In this context, sites that are positioned down-gradient but nominally rated as passing or marginal can be identified and potentially reclassified as necessary, thus providing a rational bridge between independent application and weight-of-evidence[4]. More generally, this context helps keep attention focused on the continuous nature of stressor gradients when navigating pass/fail or true/false constructs.

Numeric or narrative biological criteria are used in a binary sense to make a pass or fail assignment of condition status relative to a designated beneficial use. The binary nature of the assessment decision and the need to ascribe a cause in cases of failure sets the stage for just so[5] associations (for example, the concentration of ammonia was elevated at this site; therefore, ammonia is the culprit). This is not to say that assessments and associated causes are rife with errors. Errors are minimized by the disciplined process embodied by the compilation of the technical support document, as recently described in Norton et al. 2014[6]. Also, summary biotic index scores can be used in direct gradient analysis to help diagnose causes of impairment or identify significant stressors. A familiar example of direct gradient analysis is a bivariate x-y plot accompanied with a correlation coefficient. In simple cases, direct gradient analysis may be the most parsimonious route to stressor identification; however, as is often the case with environmental data sets, stressors are many, often colinear, and sometimes additive or covariate in nature. Applying direct gradient analysis in this context can obviously lead to misidentification of stressors.

When described in lay terms, the routine employed is remarkably straightforward:

1) group survey sites based on the similarity (or dis-similarity) of biological assemblages;
2) represent the assemblage data in 2- or 3-dimensional space as a plot with points color-coded by the groups identified in the previous step; and
3) overlay measured (for example, water quality data, QHEI habitat attributes) and derived (for example, GIS information such as land use, latitude/longitude, etc.) environmental variables in the plot to help understand how the points (survey sites) are related to the environmental gradients.

Distance Measures

Distance measures evaluate a similarity distance between sites in terms of the species abundances (or in the case of an environmental table, values of parameters). The most common distance measure used on biological assemblages is the Bray-Curtis[7] distance. This distance is essentially the ratio between the total abundance of commonly held species between two sites, and the total abundance of all species collected at

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[1] Gauch, H.G., 1982. *Multivariate analysis in community ecology* (No. 1). Cambridge University Press.

[2] McCune, B. and Mefford, M.J., 1999. PC-ord. *Multivariate analysis of ecological data, version*, *4*(0).

[3] Oksanen, J., 2009. Multivariate analysis of ecological communities in R: vegan tutorial. *URL:[http://cc. oulu. fi/, jarioksa/opetus/metodi/vegantutor. pdf]*.
Zuur, A.F., Ieno, E.N., Walker, N.J., Saveliev, A.A. and Smith, G.M., 2009. Mixed effects models and extensions in ecology with R. Gail M, Krickeberg K, Samet JM, Tsiatis A, Wong W, editors. *New York, NY: Spring Science and Business Media*.

[4] The converse is also true and nominally failing sites can be objectively classified as "impaired" due to natural causes, or the result of sampling error.

[5] *sensu* Rudyard Kipling.

[6] Norton, S.B., Cormier, S.M. and Suter II, G.W. eds., 2014. *Ecological causal assessment*. CRC Press.

[7] Beals, E.W. (1984). Bray-Curtis ordination: an effective strategy for analysis of multivariate ecological data. *Advances in Ecological Research*, 14, 1-55.

the two sites. With more species in common, the ratio will track closer to one. The other frequently used distance is Euclidean distance, and that can be thought of as the hypotenuse resulting if a given species abundance (or parameter measure) at two sites were taken as x-y coordinates (for instance, for three found at one site and four at the other, the coordinates would be 0,3 for the x; 0,4 for the y)[8]. Euclidean distances are more typically calculated for the environmental table after the environmental measures have been standardized based on how much each parameter at each assessment site deviated from the mean of all sites (z scores).

Hierarchical Clustering

Once distance measures have been calculated for the biological matrix, groups of sites can be identified using hierarchical clustering. Essentially, the clustering algorithm identifies the two most similar sites (or least dissimilar) and joins them with a branch, finds the next two most similar objects (for instance, the sites joined previously are considered an object) and joins them, and so forth. The results can be conveniently viewed as a dendrogram, or tree diagram, (Figure 1, Figure 2) where the branches represent distances; sites clustered together on one branch being more similar to each other than sites on another, such that the different branches represent different groups.

Groups were identified via indicator species analysis and verified by PERMANOVA[9] results of the two most similar groups. Indicator species analysis identifies the fish species or groups of species that are indicative of a group of sites. This is done in two ways, identifying which species (or groups of species) are found only in the identified group (exclusivity) and which species are found in most of the sites in the identified group (specificity). A species with high exclusivity and specificity to a group is considered an indicator of the group. Indicator species analysis was run putting the sites into 1 - 15 groups and identifying the number of groups which maximizes the average indicator species score (i.e. the groups identified have unique aspects to the fish assemblages).

In this case, fish assemblages were broken into five groups, and macroinvertebrate assemblages into three. The resulting groups can then be used as a categorical variable to color-code points, or to bin environmental variables, for example, as box plots (Figure 3).

Non-Metric Multi-Dimensional Scaling (NMDS)

NMDS can be thought of as a data reduction method that seeks to represent a large data set, in this case distance scores from a biological matrix, by a reduced number of dimensions. Here the dimensions are represented by axes, typically two or three. The degree of similarity between sites determines axes scores (coordinates) such that the sites can be plotted as a scatterplot (Figure 4). Sites clustering together on the plot are more similar to each other than to other sites, and in this regard, NMDS is analogous and complementary to hierarchical clustering. Color-coding the points on the NMDS plot by groups identified in the hierarchical clustering exercise is a way to cross-check the results to determine if a given site was misclassified and to gain confidence that the groups are meaningful.

Because NMDS transforms the biological matrix into constructs of two or more axes, associations with environmental variables can be measured, and the results plotted as vectors emanating from the center of the plot (Figure 5,). For example, because drainage area (DA) strongly correlates with the first NMDS axis (x-axis) and weakly correlates with the second or y-axis, it plots as a long arrow almost parallel with the x-axis. In this way, the relationships between sites and environmental stressors or gradients can be

[8] Euclidean distances are actually calculated from squared differences.

[9] adonis {R package 'vegan'}

visualized simultaneously, thus facilitating the identification of which stressor or gradient is most proximate to a given site.

Using the Resulting Information

Knowing how individual sites group together and relate to stressors or gradients provides for a more informed interpretation of bivariate plots of summary index scores (for example, IBI) or proxies (EPT richness) against identified stressors. For example, sites can be coded to the groups identified by hierarchical clustering, and separate regression lines drawn for the various groups. More generally, succinct narratives can be constructed for the various groups to quickly communicate ecological status in a way that is at least complementary to the traditional biological narratives, but arguably more literal and informative.

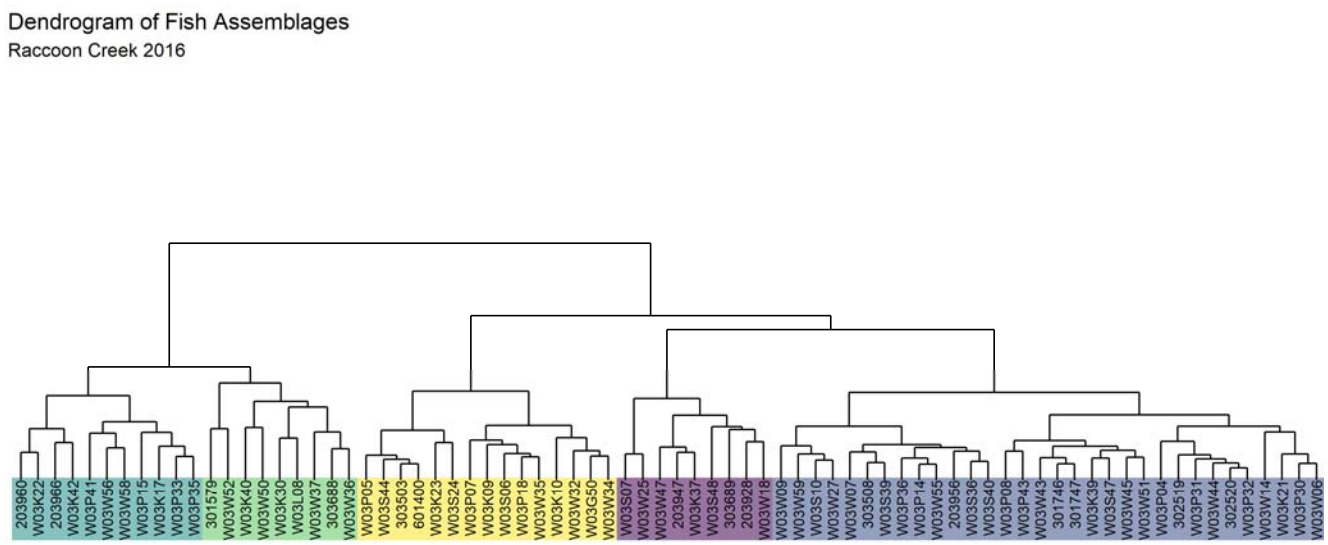

Figure 1 — A dendrogram resulting from hierarchical clustering of fish assemblages sampled from the Raccoon Creek watershed. Labels hanging from the terminal branches are station codes.

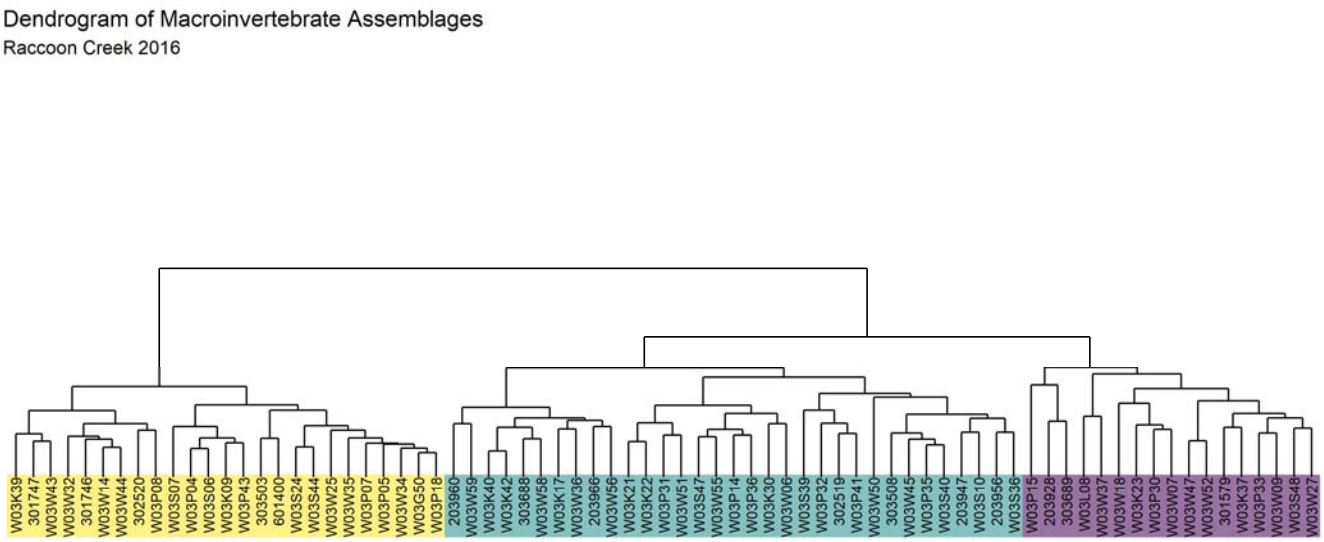

Figure 2 - A dendrogram resulting from hierarchical clustering of macroinvertebrate assemblages sampled from the Raccoon Creek watershed. Labels hanging from the terminal branches are station codes.

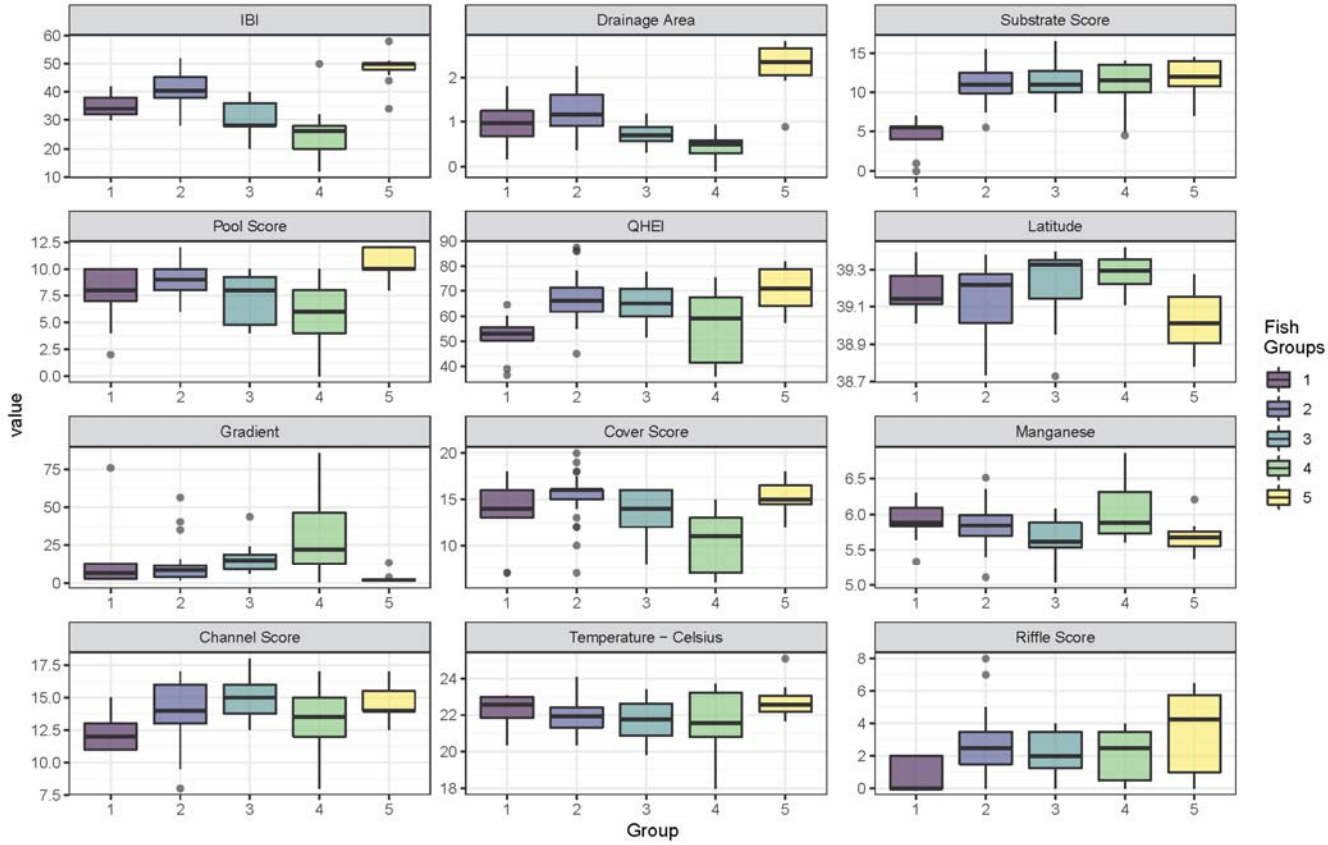

Figure 3 — Boxplots of select environmental variables by hierarchical clustering groupings of fish assemblages.

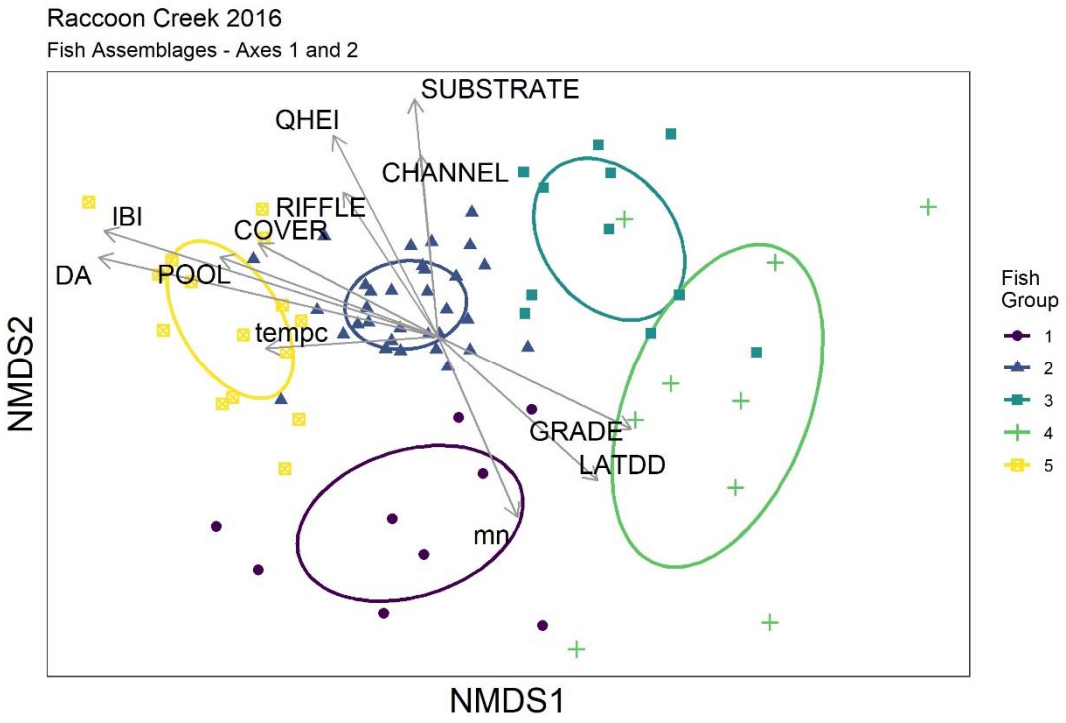

Figure 4 — Raccoon Creek fish assemblages plotted by axis scores assigned by two-dimensional NMDS. Points are colored to reflect groups suggested by hierarchical clustering.

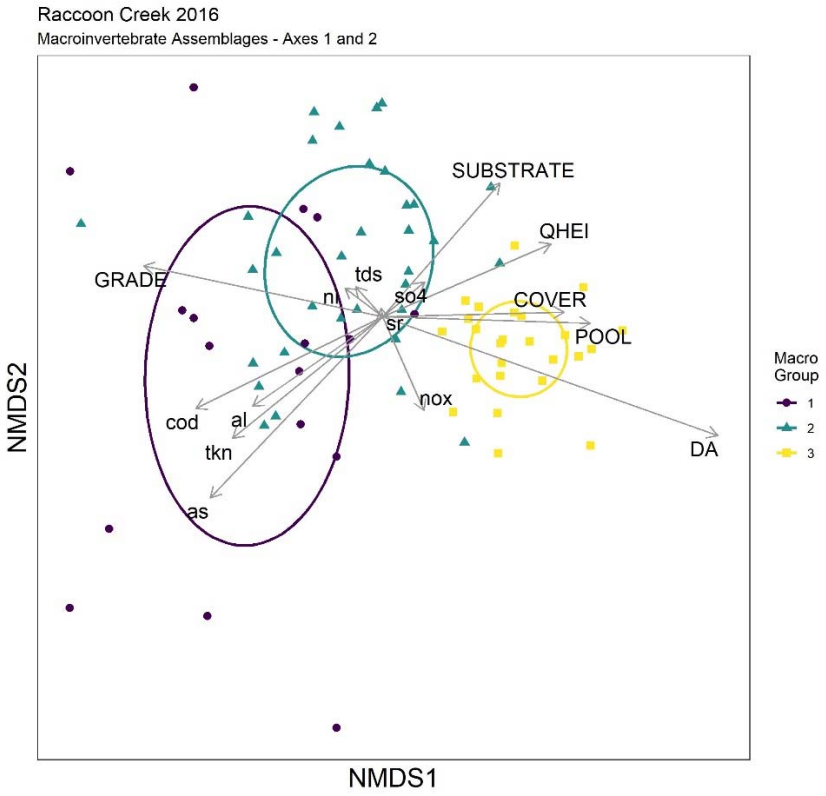

Figure 5 — Raccoon Creek macroinvertebrate assemblages axes one and two of a three-dimensional NMDS plot with environmental variable overlay.

Appendix N — Lake Sampling Results

Lake Alma, 2016-17

Inland Lake Water Quality Report

Lake Alma 2018

Division of Surface Water
Inland Lakes Program
2019

Lake Alma

Inland Lake Water Quality Report

2019

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Introduction: Inland Lakes Monitoring

Ohio EPA has implemented a sampling strategy that focuses on evaluating chemical conditions near the surface and physical conditions in the water column of inland lakes. Physical profile measurements are summarized either for the entire water column or the epilimnion depending on the existence of thermal stratification. The sampling target consists of an even distribution of 10 sampling events divided over a two-year period and collected during the recreation season of May 1 through October 31.

Key parameters analyzed in lakes include chlorophyll-*a*, ammonia, D.O., pH, total dissolved solids along with various metals for multiple beneficial use assessments. Other parameters used to evaluate lakes include Secchi depth, total phosphorus and total nitrogen. Details of the sampling protocol used at the time of this sampling are outlined in the ***2016 Inland Lakes Sampling Procedures Manual***. Sampling objectives for inland lake surveys are defined in Ohio EPA's Inland Lakes Sampling QAPP, and the rules relative to inland lakes beneficial uses are described in the 2010 and successive Water Quality Monitoring Integrated Reports.

Figure 1 — Location of Lake Alma in southeastern Ohio

Study Lake: Lake Alma

This lake report will describe the physical characteristics of Lake Alma and the watershed that feeds it. It will then discuss the physical, chemical and biological aspects that existed during the 2016-2017 sampling effort. These sampling results are then applied to relevant beneficial uses, and a trend assessment is provided comparing 2016/2017 results to data collected from Lake Alma during 2015 and 1980. Finally, lake management implications are discussed for potential water quality improvement strategies.

Lake Alma is owned by the City of Wellston and located within the Lake Alma State Park, which is managed by the Ohio Department of Natural Resources. The lake is in Vinton County, on the northern border of the Village of Wellston (Figure 1). An in-stream impoundment fed by two unnamed tributaries to Little Raccoon Creek, Lake Alma lies within the Headwaters Little Raccoon Creek watershed (hydrologic unit 05090101-04-01) and is within the Western Allegheny Plateau (WAP) ecoregion (Table 1). It has a surface area of 65 acres and a maximum depth of 4 meters. The lake was built along the east bank of Little Raccoon Creek by placing the dam (1500 feet) at the confluence of two unnamed tributaries (UNT), creating 159.8 million-gallon lake and a 457.4-acre watershed. The lake has an 8.2-acre island near the west shore.

Table 1 — Lake Alma Key Attributes

Lake Type:	**Dam/Permanent Impoundment[1]**
Ecoregion:	Western Allegheny Plateau (WAP)
Surface Area:	65 acres[1]
Length of Dam:	1500 feet[1]
Storage Capacity:	*110.6 million gallons[1] (21.4 million ft3)
Shoreline:	2.26 miles
Watershed:	457.4 acres
Maximum Depth:	4.5 meters (14.6 ft.)[2]
*at Principal Spillway Elevation	

[1] ODNR Division of Water **(Ohio Department of Natural Resources, 2018)**
[2] Ohio EPA 2016 study data

Physical Attributes

The L1 sampling location is centered at GPS location 39.1466 latitude -82.5166 longitude (Figure 2). The "L1" naming convention indicates a primary sampling location that is deemed representative of the whole lake and is the location used to determine attainment status of applicable beneficial uses. Other locations (e.g. L2, L3 etc.) may be determined necessary to support attainment decisions on larger lakes and reservoirs. Constructed in 1903 by a wealthy coal operator, C.K. Davis, Lake Alma was built as part of an amusement park. The amusement park lasted seven years and the lake was later purchased by the city of Wellston as a public water supply (ODNR website). Wellston leases the area to the Ohio Department of Natural Resources for the use as a state park. Lake Alma State Park has two swimming beaches, sand volleyball and a fenced-off dog swim area. Hiking, hunting, fishing, boating rental and an 82-site campground are all located within the 292-acre park. The park is used heavily by the nearby residents. There is a concrete public boat ramp located on the east side of the lake and an electric motor only restriction for motor-boating.

Figure 2 — Aerial imagery of Lake Alma with location of L1 shown. Sources: Ohio Statewide Imagery Program Service.

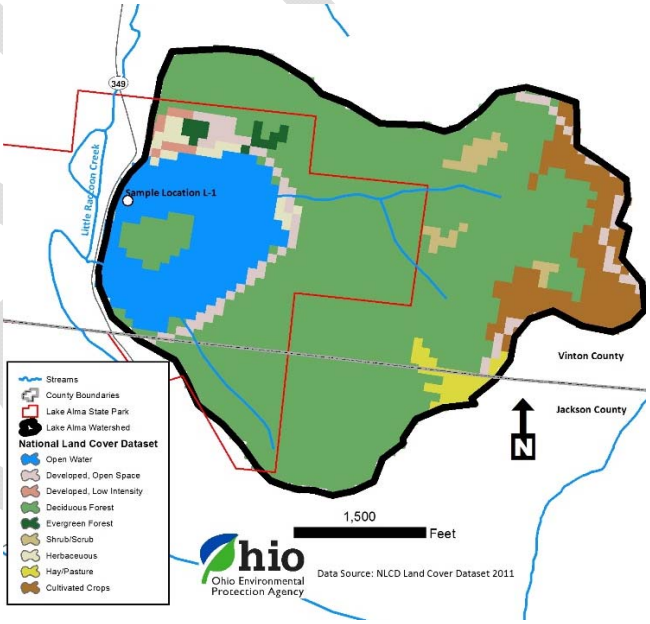


Figure 3 — Land cover in the watershed draining to Lake Alma.

Watershed Overview

Lake Alma discharges to Little Raccoon Creek at RM 30.65. The two UNTs that feeds Lake Alma drain only 457.4 acres of which 327.3 acres (71.6%) is contained within the Lake Alma State Park. The landscape is heavily wooded and is dominated by mixed oak forests. Land use within the Lake Alma watershed is comprised of 9.5 percent agriculture, 69.4 percent forested areas (mostly deciduous forest) and 13.8

percent open water. The other 7.3 percent is composed of developed and open spaces, 4.7 percent and shrubland areas, 2.6 percent. (Figure 3).

Geological characteristics associated with the Lake Alma area are made up of Pennsylvanian-aged Allegheny and Pottsville Group - Shale, siltstone, and underclay. The Allegheny and Pottsville Group has extensive coal seams, some as much as 12 feet thick. Coal mining within Lake Alma watershed was comprised of 24-acres of underground mining on the southern border of the watershed (below the elevation of the lake bottom) and 161-acres of surface mining in the 1980s and 1990s. The reclaimed surface mining accounts for much of the shrubland and pasture lands. The soils in the valley of the watershed originate from loess and silty colluvium or old alluvium in valley fills formed by abandoned pre-glacial drainage systems. The soils surrounding Lake Alma itself are moderately to poorly well drained. The soils on the hillsides are well drained and originate from sandstones. The Lake Alma area is moderately hilly with a change in elevation of only 160 feet.

Results Discussion

Water Column Chemistry

A physical profile of the water column was evaluated during each sampling event at the L1 sampling location at Lake Alma. Readings were recorded at the surface (which is defined as a 0.5-meter depth), at 0.5-meter intervals thereafter, with a final measurement collected 0.5 meters above the bottom of the lake.

Physical conditions changed very little throughout the sampling season in this shallow lake. No thermal stratification occurred during the sampling season. Thermal stratification occurs in deep lakes during the warm summer months, consisting of an upper mixed zone (epilimnion), a slightly denser middle zone (metalimnion), and a lower zone (hypolimnion) where mixing is impeded by a density barrier caused by lower water temperatures near the bottom of a lake. A sharp decrease in temperature and dissolved oxygen is often noted where the hypolimnion forms. However, in the case of Lake Alma, water temperature and dissolved oxygen decreased slightly through the water column (Figure 4). The largest thermal change in the water column was 5.6 ^{o}C, although the dissolved oxygen reached hypoxic conditions in the last 0.5 meters of water during late summer. The low oxygen condition near the bottom of the lake occurred during widespread blue-green algal blooms in 2016.

Fish access to habitat, cool water and benthic prey can be limited if any part of the water column becomes hypoxic. An oxygen deficit, defined for the purposes of this report as a concentration of 4 mg/L or less, was documented during late summer 2016 sampling event at L1. The zone of oxygen deficit extended from the bottom of the lake to 1.0-meters in depth. Under these conditions, organically bound phosphate in lake sediments decomposes and is converted to orthophosphate (the biologically available form of phosphate), that is available for biological uptake. Because orthophosphate is a reactive form of phosphorus, its concentration is often a good indication of the amount of phosphorus that is readily available for plant and algae growth. Orthophosphate averaged 2.15 ug/L during the 2016-2017 sampling season but was recorded at 11.1 ug/L during the September 2015 sampling.

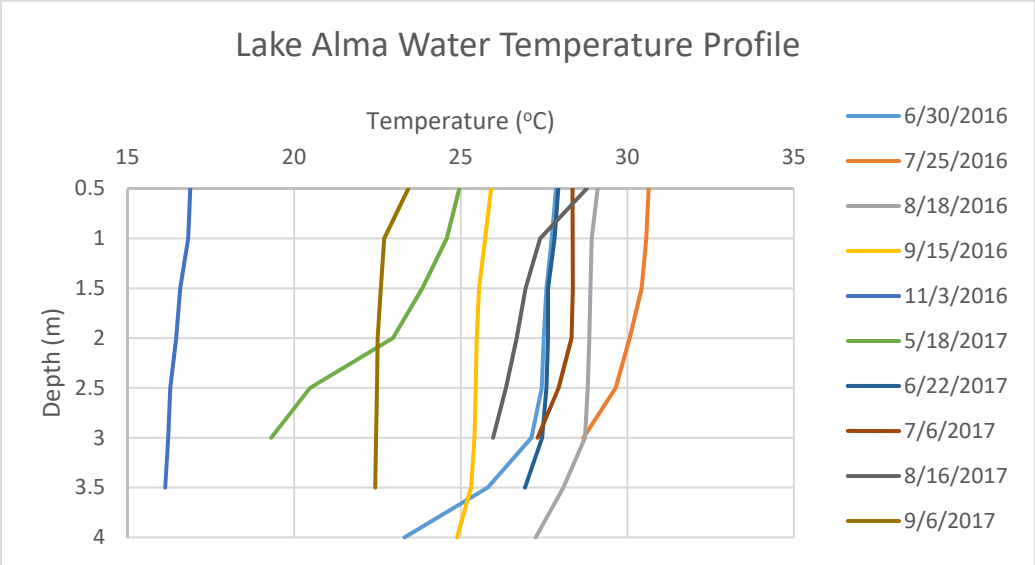


Figure 4 — Temperature profiles recorded during 2016 and 2017.

Lake Alma transparency at L1 averaged 2.26 meters over the sampling period (median 2.32 m) and reaching as high as 3.39 m. Low Secchi readings in Lake Alma were caused by blue-green algal growth in this shallow but somewhat-productive lake. Profile data indicated dissolved oxygen trending downward as late summer progressed, likely resulting from dying algae, lack of inflow and increasing water temperatures. Dissolved oxygen levels in the epilimnion did not fall below the EWH inland lakes minimum criterion of 5.0 mg/l, and typically ranged from 7 mg/L to 9 mg/L due to the extensive amount of macrophytes in the lake (Table 2). The dissolved oxygen criterion of 5.0 mg/l applies throughout the water column in unstratified lakes like Lake Alma and did fall below the EWH D.O. criteria of 5.0 mg/L during three of the ten sampling events.

Table 3 — Dissolved oxygen concentration in Lake Alma, L1, 2016-2017.

Dissolved Oxygen Concentrations, Lake Alma L1 2016 and 2017			
Parameter (mg/L)	D.O. (mg/L) - Surface	D.O. (mg/L) - Bottom	Mean D.O. (mg/L) – Whole Water Column
Aquatic Life Criterion	**≥5.0[1]**		
6/30/2016	8.26	0.49	7.65
7/25/2016	8.93	5.64	7.97
8/18/2016	8.75	1.09*	7.32
9/15/2016	9.4	0.82*	8.26
11/3/2016	9.62	7.73	9.00
5/15/2017	9.87	10.29	10.26
6/22/2017	8.25	7.32	7.55
7/6/2017	7.46	6.81	7.10
8/16/2017	7.47	6.89*	7.30
9/3/2017	9.71	7.27	8.39

[1] The dissolved oxygen criteria apply in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.
*Harmful Algal Bloom

Metals, nutrient and other physical parameters such as dissolved oxygen, pH, turbidity, and alkalinity were collected and analyzed from the surface at L1. The results were compared to the statewide EWH criteria and aquatic life use benchmarks. No exceedances were recorded during this sampling effort.

The amount of phosphorus in a lake is important because it is commonly the growth limiting nutrient. Sources of phosphorus to a lake can be external (i.e. tributary loading or precipitation) and internal (i.e. biota, sediment or groundwater). Only a small portion of organic phosphorus is available for biological uptake, but in dissolved ionic form (orthophosphate), it passes easily through membranes and is readily available. Decomposition of dead plants and animals releases inorganic phosphorus into the water column. Phosphorus bound to particulate matter in the sediment can also be released to the water column under hypoxic conditions if the bond is redox sensitive (i.e. iron or calcium).

Nutrient parameters were analyzed to help understand trophic dynamics in Lake Alma. Internal loading of phosphorus was determined to be a potential factor in this system. Total phosphorus concentration at the surface based on the 10 sampling events averaged 8.33 µg/l while bottom mean concentration was 66.78 µg/l. Dissolved orthophosphate averaged 2.00 µg/l the bottom and 2.88 µg/l at the surface.

The presence of nutrients, especially phosphorus, can stimulate the growth of algal blooms. The bioavailable orthophosphate was detected in all but one sample at the surface. This process may be exacerbated during autumn when thermal stratification degrades, and the lake experiences the complete mixing associated with fall turnover. Total nitrogen (TN) is the sum of total Kjeldahl nitrogen (TKN) and nitrate/nitrite and can be an important factor in systems that are nitrogen limited. TN values were more reflective of a mesotrophic (medium productivity) or even oligotrophic (low production) system throughout the sampling season with one sample reaching eutrophic conditions at 1600µg/l. This result is more indicative of a eutrophic (highly productive) system that often experiences seasonal shifts in phytoplankton structure (Wetzel, 2001).

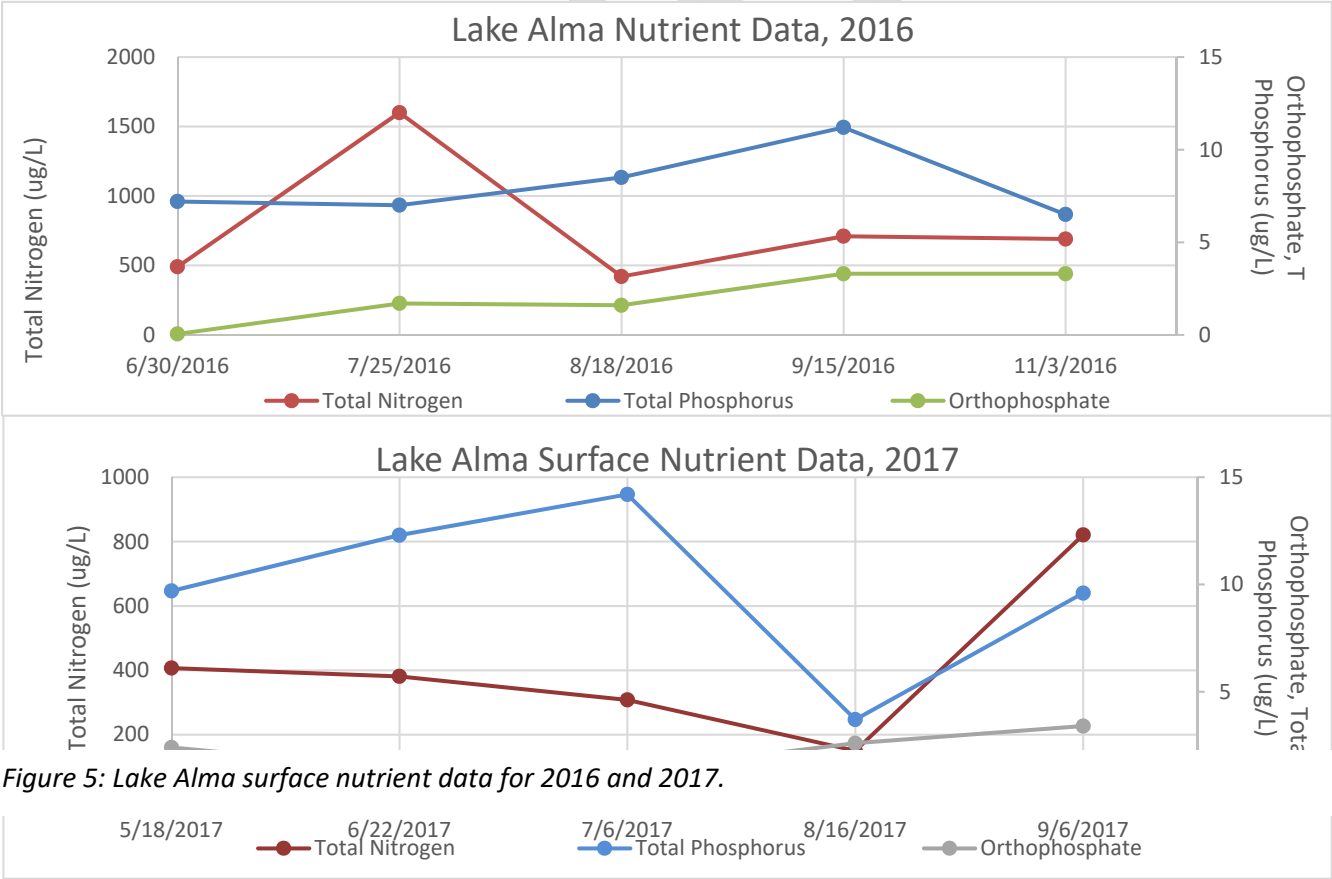


Figure 5: Lake Alma surface nutrient data for 2016 and 2017.

Sediment Chemistry

A sediment grab sample was collected using a Petite Ponar dredge during July 2016 at L1 and was analyzed for metals, nutrients, volatile organic compounds, PCBs and pesticides (organo-chlorine insecticides) (Figure 6) (for ammonia concentrations in sediment similar to the Ontario research-based thresholds for phosphorous or total organic carbon. The sediment concentration of ammonia at L1 was 76.7 mg/kg.

Table 4).

Sediment data were evaluated using *Ohio Sediment Reference Values (SRVs)* (Ohio EPA, 2008)along with guidelines established in *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* (MacDonald, Ingersoll, & Berger, 2000). Ohio EPA SRVs represent ecoregion background conditions for metals based on data collected at Ohio reference sites. These values were developed for lotic (flowing) water bodies and are based on Ohio ecoregions. Sediment concentrations for lentic (non-flowing) surface water bodies can be screened using these values. MacDonald guidelines define two levels of ecotoxic effects. A threshold effect concentration (TEC) is a level of sediment chemical quality below which harmful effects are unlikely to be observed and can be considered comparable to background conditions. A probable effect concentration (PEC) indicates a level above which harmful effects are likely to be observed. These guidelines include both metals and organic parameters.

Figure 6 — Use of a Petite Ponar dredge for lake sediment sample collection.

Finally, guidelines established by the Ontario Ministry of the Environment (Persuad, Jaagumagi, & Hayton, 1993) were used to evaluate sediment sample results for total organic carbon (TOC) and total phosphorus (TP). These guidelines include the lowest effect level (LEL) and the severe effect level (SEL). The LEL is a level of sediment concentration that can be tolerated by a majority of benthic organisms. The SEL is a concentration considered harmful to most benthic organisms.

Organic compounds were undetected in the sediment sample collected at L1, and, thus, are not reported in for ammonia concentrations in sediment similar to the Ontario research-based thresholds for phosphorous or total organic carbon. The sediment concentration of ammonia at L1 was 76.7 mg/kg.

Table 4. Concentrations of nickel, iron, magnesium, manganese and zinc were above the Ohio SRVs for the Western Allegheny Plateau ecoregion, all other metals were below detection. Cadmium, chromium, copper, lead, and manganese exceeded the LEL, but were still below the SEL. Total organic carbon, arsenic, cadmium, copper, lead, nickel, zinc and total phosphorus exceeded the LEL. Cadmium and lead exceeded the TEC (for ammonia concentrations in sediment similar to the Ontario research-based thresholds for phosphorous or total organic carbon. The sediment concentration of ammonia at L1 was 76.7 mg/kg.

Table 4).

Sediment nutrient concentrations were slightly elevated at L1. The sample result of 5.6 percent for TOC exceeded the LEL of 2.5 percent. Additionally, the sediment sample result of 935 mg/kg TP exceeded the LEL of 600 mg/kg. This indicates a baseline concentration of phosphorus is present in the lake's sediment, further reinforcing that internal loading of phosphorus may be occurring and contributing to algal bloom growth. Ohio EPA does not currently utilize a reference guideline for ammonia concentrations in sediment similar to the Ontario research-based thresholds for phosphorous or total organic carbon. The sediment concentration of ammonia at L1 was 76.7 mg/kg.

Table 4 — Chemical parameters measured above screening levels in samples collected by Ohio EPA from bottom sediments in Lake Alma, September 2017.

Parameter	L1 Concentration
TOC (%)	**5.6**
Arsenic (mg/kg)	**7.18**
Cadmium (mg/kg)	**1.32**
Chromium (mg/kg)	13.6
Copper (mg/kg)	**24.5**
Lead (mg/kg)	**45.7**
Nickel (mg/kg)	***69.7***
Selenium (mg/kg)	<3.52
Aluminum (mg/kg)	20300
Barium (mg/kg)	<414.5
Calcium (mg/kg)	21000
Iron (mg/kg)	*63300*
Magnesium (mg/kg)	*5930*
Manganese (mg/kg)	*2900*
Potassium (mg/kg)	<4144.6
Sodium (mg/kg)	<10361
Strontium (mg/kg)	64.4
Zinc (mg/kg)	***289***
Ammonia (mg/kg)	76.7
T-Phosphorus (mg/kg)	**935**

< - not detected at or above the method reporting limit.

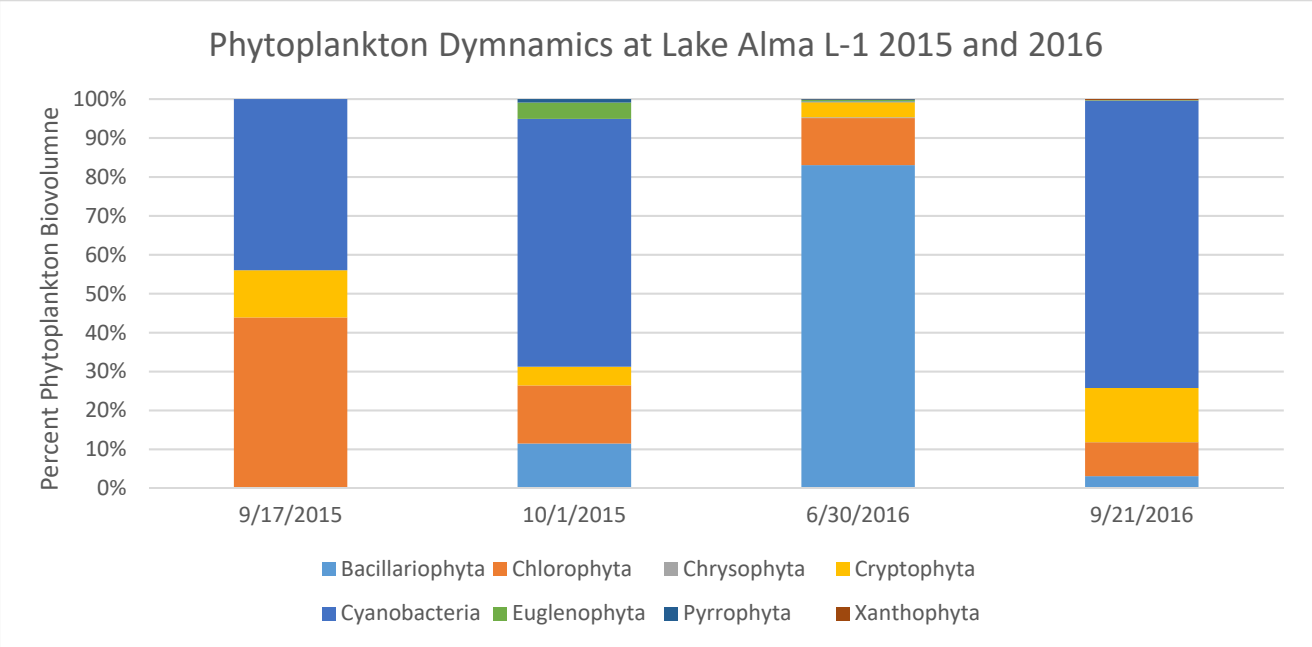
Contamination levels were determined for parameters using Ohio Sediment Reference Values (SRVs), consensus-based sediment quality guidelines (MacDonald, et.al. 2000) and guidelines from the Ontario Ministry of the Environment (Persuad et. al. 1993). Bold numbers indicate values above the Lowest Effect Level (LEL). Italic number indicate values above SRV.

Phytoplankton Results

The phytoplankton community in Lake Alma was characterized based on water samples collected using an integrated tube sampler deployed to either a maximum of two meters (m) or twice the Secchi depth if less than one meter. Samples were collected at L1 during sampling events in 2015, 2016 and 2017. Samples

were preserved with Lugol's solution and submitted to BSA Environmental Services, Inc. for analysis. The phytoplankton present in a representative aliquot were identified to at least genus level (usually species) in accordance with *Standard Methods for the Examination of Water and Wastewater* Method No. 10200 (American Public Health Association 2012). Cell densities (cells/L) and bio-volumes ($\mu m^3/L$) were then estimated. Phytoplankton communities exhibit a seasonal succession when factors like water temperature, nutrients, transparency and photoperiod favor certain types. Grazing by larval fish and zooplankton also affects community composition. Temperate lakes in Ohio are usually dominated by diatoms (Bacillariophyta) in the spring until micronutrients like silica are depleted, then by blue green algae (cyanobacteria) in the fall, when an ability to control buoyancy and fix nitrogen from the atmosphere gives certain types a competitive edge.

The Phytoplankton population at Lake Alma L1 contained nine different classes of algae represented in the samples collected. Cyanobacteria represented about 0.2 percent of the total biovolume of phytoplankton during the early summer of 2016 with diatoms and green algae (Chlorophyta) making up 83.1 and 12.1 percent, respectively. This trend was reversed in September 2016 with blue-green algae comprising 73.8 percent of the total biovolume with diatoms and green algae making up 3.1 and 8.7 percent, respectively. In 2017, diatoms had a weak start in the spring at 6.7 percent and never increased through the summer. Golden-brown algae (Chrysophyta) began the spring at 65 percent, increasing to 79.4 percent of the biovolume in June before decreasing throughout the summer with blue-green algae taking over in August 2017. When breaking down the results by sampling event, the total biovolume of cyanobacteria increased sharply throughout the summer during each year. The August, September and October phytoplankton samples were comprised of between 44 and 97.4 percent cyanobacteria (Figure 7).



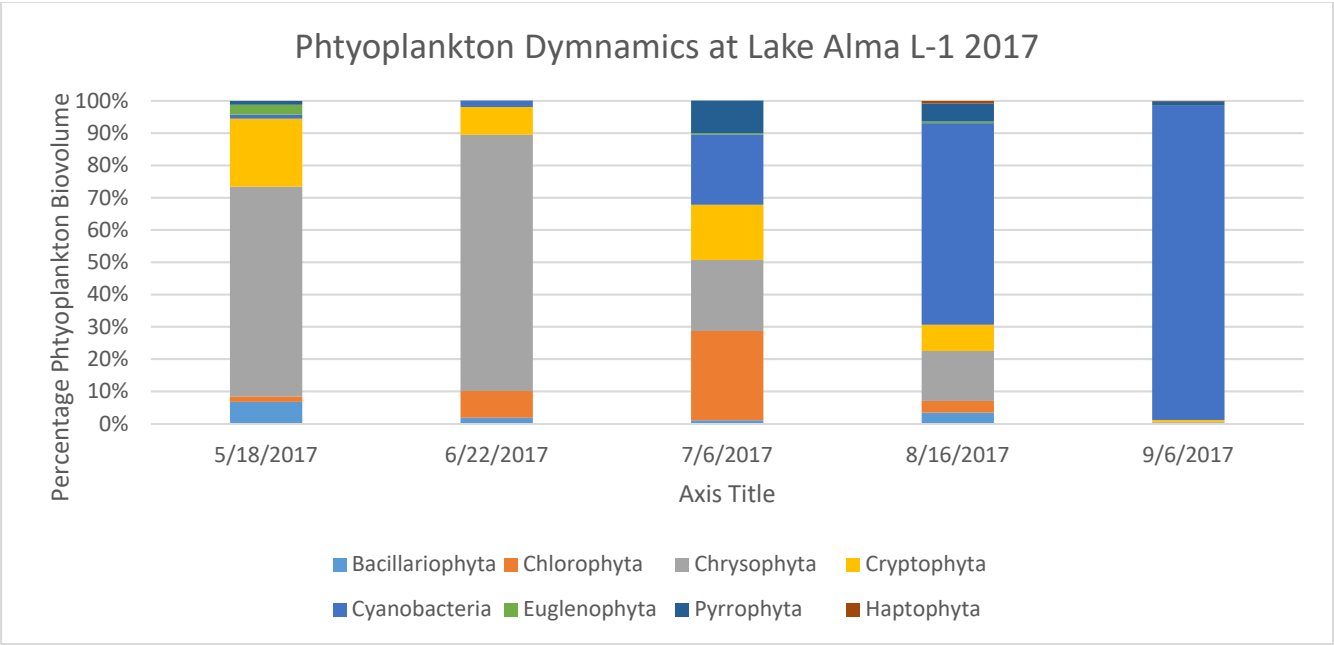


Figure 7 — Phytoplankton dynamics at Lake Alma during 2015, 2016 and 2017.

A community dominated by cyanobacteria is of concern when toxin-producing phytoplankton are present. Discussion of cyanotoxin sampling results is contained below in the Recreation Use Assessment section. Genera of phytoplankton that can produce cyanotoxins identified within the samples collected at Lake Alma included *Anabeana, Aphanizomenon, Aphanocapsa, Cylindrospermopsis*, *Dolichospermum* (fka: *Anabaena*), Merismopedia, *Microcystis, Planktonlyngbya and Woronichinia* (D'Anglada, 2016). The toxin producing cyanobacteria made-up 46.5 to 100 percent of the blue-green algae species in each phytoplankton sample. Seasonal phytoplankton succession in reservoirs can be quite complicated and highly variable. This variability can even exist longitudinally, with completely different communities dominating the upper, middle and lower sections of larger reservoirs (Wetzel, 2001). However, the existence of toxin producing cyanobacteria along with a major shift toward cyanobacteria dominance are symptomatic of a nutrient enriched system resulting in blooms such as that depicted in figure 8.

Figure 8. Algal bloom at Lake Alma August 16, 2016.

Beneficial Use Assessment

Public Drinking Water Use Assessment

Like all public lakes in Ohio (except Piedmont Reservoir), Lake Alma is designated a public water supply (PWS) in the Ohio WQS. Lake Alma was used as a primary public water supply for the city of Wellston with a ten-inch pipe connected to the City's north water treatment plant (WTP). In 2015, microcystin was detected in the raw water at the WTP so the City ceased using this water supply (see Raccoon Creek TSD).

Recreation Use Assessment

Ohio conducts a monitoring and notification program to notify the public whenever bacteria and algal toxin levels present a potential health risk to those engaged in water activities. In support of this monitoring program, bacteria and algal toxin concentrations were examined to determine suitability for recreation use. *Escherichia coliform* (*E. coli*) bacteria were measured close to the bathing beach, just north of the L1 station. This site was sampled five times over the assessment period. The geometric mean value for *E. coli* was compared to the bathing water (waters heavily used for swimming) criterion of 126 CFU/100 mL of sample. Furthermore, each data point was also compared to the Statistical Threshold Value (STV) of 410 CFU/100 mL using a minimum of five sampling results in a 90 day period. The geometric mean of this data was 10.0 CFU/100 mL, well below the bathing water criterion and none of the samples exceeded the STV (Table 5).

Table 5 — 2016 E. coli results.

Parameter	E. coli (CFU/100 mL)
Bathing Water Criterion	**126 PCR / 410 STV**
7/18/2016	<10
7/26/2016	10
8/11/2016	<10
8/16/2016	10
8/17/2016	<10
Geomean	**10**

Figure 9. Recreation public health advisory posted by ODNR between the Lake Alma boat ramp and the east beach in late summer 2016. The red sign warns "Danger Toxins at unsafe levels have been detected. Avoid all contact with the water.

Standards for algal toxin concentrations are currently being developed, but the State of Ohio has established thresholds for recreational advisories. For public beaches, a recreational public health advisory is posted (figure 9) when a possible harmful algal bloom (HAB) is visually confirmed and/or when cyanotoxin levels are equal to or exceed recreational public health advisory thresholds, whether or not a HAB is still present. An elevated recreational public health advisory (no contact) is posted when cyanotoxin levels are equal to or exceed the elevated recreational public health advisory thresholds (State of Ohio, 2016).

Since Lake Alma is considered a recreation lake, samples were collected and analyzed for microcystin, saxitoxin and cylindrospermopsin on all five sampling events at L1 during 2016. The results for all toxin samples were below the current advisory thresholds for recreation water for all three toxins indicating safe levels based upon these sampling events. Anatoxin was not analyzed during this survey. Results from 2015 and 2017 are listed for comparison (Table 6).

*Table 6 — Summary of data used to determine the recommended advisory thresholds for cyanotoxins in recreational waters (2015-2017)***.**

Parameter (µg/L)	Microcystins	Cylindrospermopsin	Saxitoxin
Proposed Criterion (Advisory)	**6**	**5**	**0.8**
Proposed Criterion (No Contact)	**20**	**20**	**3**
9/17/2015	0.31 J	0.021 U-	0.018 U-
10/1/2015	< 0.3 U+	< 0.05 U+	< 0.022 U-
6/30/2016	< 0.3 U-	< 0.05 U-	< 0.022 U-
7/25/2016	< 0.3 U-,J	< 0.05 U+	< 0.022 U-
8/18/2016	< 0.3 U+	< 0.05 U-	0.089
9/15/2016	0.38	< 0.05 U-	0.087
11/3/2016	0.6	< 0.05 U-	0.073
5/18/2017	<0.3 U-	<0.05 U-	<0.02 U-
6/22/2017	<0.3 U-	<0.05 U-	<0.022 U-
7/6/2017	<0.3 U-	<0.05 U-	0.0451
8/16/2017	0.3 U+	<0.05 U-,U-	0.0869
9/6/2017	<0.3 U+	<0.05 U-	0.178
% Over Threshold	**0**	**0**	**0**
Narrative	**support**	**support**	**support**

J: The analyte was positively identified; the associated numerical value is estimated.
U+: The reported value is between the laboratory method detection limit and the reporting limit.
U-: The reported value is less than the laboratory method detection limit

Human Health - Fish Consumption

Ohio has been sampling streams annually for sport fish contamination since 1993. Fish are analyzed for contaminants that bioaccumulate in fish and that could pose a threat to human health if consumed in excessive amounts. Contaminants analyzed in Ohio sport fish include mercury, PCBs, DDT, mirex, hexachlorobenzene, lead, selenium and several other metals and pesticides. Other contaminants are sometimes analyzed if indicated by site-specific current or historic sources.

Fish tissue sampling has not been collected recently for Lake Alma. No consumption advisories have been issued beyond the statewide advisory for mercury because of this sampling effort. Statewide fish consumption advisories can be found at ***epa.ohio.gov/dsw/fishadvisory/index.aspx***.

Aquatic Life Use Assessment

The aquatic life use (ALU) designation for all inland lakes in Ohio is exceptional warmwater habitat (EWH) except for upground reservoirs which are designated warmwater habitat (WWH). In order to evaluate the ALU in Lake Alma, ammonia, dissolved oxygen, pH, total dissolved solids and various metals were analyzed. Statewide water quality criteria for these parameters are summarized in Table 35-1 of the Ohio water quality standards. Other important parameters for assessing lake condition in Lake Alma included nutrient parameters (e.g. total phosphorus, total nitrogen) and biological response variables (e.g. chlorophyll-a).

Where criteria do not exist, a common approach to assessing relative lake condition is to compare lake water quality sampling data to a regionally and lake type derived percentile (e.g. 25th) of existing lake data. The lower 25th percentile generally represents minimally impacted conditions protective of designated uses. For Ohio EPA, inland lake aquatic life use benchmarks were calculated for total nitrogen (T-N), total phosphorus (T-P) and chlorophyll-a (Chl. a) based on the lower 25th percentile of lake median data and for Secchi depth based on the upper 75th percentile of lake median data. All data used for benchmarks were collected by Ohio EPA from Ohio inland lakes between 1989 and 2006.

Lake samples were collected from near the surface of Lake Alma five times each during the 2016 and 2017 recreation seasons. Statewide Outside Mixing Zone Average (OMZA) water quality criteria listed in tables 35-1 through 35 of section 3745-1-35 of the OAC (Water Quality Standards) were used for most parameters to evaluate the existing EWH designated use for Lake Alma. Dissolved Oxygen is compared against the statewide OMZ Minimum criteria. Sampling results determined that Lake Alma had no exceedances of the EWH ALU criteria during the 2016/17 field season (Table 6).

Assessment of other important lake parameters reveals that Lake Alma exceeded no regional 25th percentile benchmarks for T-P, Chl.a nor transparency during the 2016/17 survey (Table 6). However, the total nitrogen (T-N) median was well above the benchmark of 350 ug/l. These results are indicative of nutrient enrichment common to Ohio reservoirs with large drainages. Enrichment in the form of nitrogen is favorable to certain cyanobacteria, and this condition may be responsible for elevated cyanobacteria concentrations during the late growing season at Lake Alma during 2016 and 2017 (Figure 7).

Table 7 — Summary of important lake data collected in Lake Alma.

Aquatic Life Use Benchmarks Parameter	Chl. a (µg/L)	Secchi (m)	TN (µg/L)	TP (µg/L)	D.O. (mg/L)	pH (SU)	NH3-N (mg/l)
ALU Benchmarks	**≤6.2 median**	**2.16 min**	**≤350 median**	**≤14 median**	**≥5.0**	**6.5>pH<9.0**	**(WQS)**
6/30/2016	4.9	2.15	490	7.2	7.65	7.69	<0.05
7/25/2016	5.5	1.82	1600	7.0	7.97	7.87	<0.05
8/18/2016	32.2	2.0	420	8.5	7.32	7.37	<0.05
9/15/2016	158	0.95	710	11.2	8.26	7.66	<0.05
11/3/2016	16	2.69	690	6.5	9.0	7.5	0.113
5/18/2017	3.94	2.95	407	9.7	10.26	7.67	0.0551
6/22/2017	4.36	3.39	381	12.3	7.55	7.85	<0.05
7/6/2017	4.84	3.33	308	14.2	7.1	7.9	<0.05
8/16/2017	0.365	2.49	150	3.7	7.3	7.65	<0.05
9/6/2017	65.5	0.81	821	9.6	8.39	7.87	<0.05
Median	**5.2**	**2.32**	**455**	**9.05**			

Trend Assessment

Ohio EPA conducted a detailed assessment of chemical, physical and biological conditions of Raccoon Creek watershed and its tributaries during the summer of 2016 to determine if the streams within the watershed were attaining water quality goals. The survey revealed that Raccoon Creek possessed good water quality with few exceedances of Ohio WQS. Iron exceeded the WQS of 5000 mg/l, possibly due to past mining. Ammonia was in exceedance of the WQS downstream stream of some of the wastewater treatment plants. Dissolved oxygen was below the minimum WQS, mostly due to slow moving water. Specific conductivity and total dissolved solids exceeded the WQS due exclusively to past coal mining. There were some elevated bacteria counts were found throughout the watershed, likely due to sewage discharges from unsewered areas, inadequate manure management and unrestricted cattle access to streams. Three sites were assessed downstream from Lake Alma, on Raccoon Creek located at RM 29.2, RM 22.0 and RM 10.2. All three sites meet the Exceptional Warmwater Habitat aquatic life use.

Lake Alma was assessed in May and August 1978 and April and August 1990 as a part of a Section 314 Clean Lakes Assessment Grant. This data was summarized in the 1982 *305(b) Report* and eventually integrated into Volume 3 of the 1996 *Ohio Water Resource Inventory 305(b) Report*, which can be found at ***epa.ohio.gov/portals/35/documents/96vol3.pdf*** (Ohio EPA, 1996). The report describes trophic state index (TSI) as one of several metrics used to assess the condition of Ohio's public lakes. Carlson's TSI is a numerical representation of a lake's state of productivity along a scale of 0 to 100. Each major division (10, 20, 30, etc.) represents a doubling in algal biomass based on transparency, total phosphorus and chlorophyll-*a* measurements (Carlson, 1977). Unproductive, oligotrophic lakes score on the lower end of the scale, mesotrophic lakes are in the middle and eutrophic/hyper-eutrophic lakes occupy the upper end of the continuum. In 1981, Lake Alma was determined to have a final TSI of 58.0, a eutrophic condition. It is worth noting that the Ohio Water Resources Inventory 305(b) Report (OWRI)indicates lake are hyper-eutrophic if the TSI is greater than 66.

The Carlson TSI values were calculated in the same manner as in the 1990 *Ohio 305(b) Lakes Report*, using formulas from Reckhow and Chapra (Reckhow & Chapra, 1983) as follows:

- Secchi disk TSI = 60 - 14.41 ln (*SD meters*)

- Chlorophyll-*a* TSI = 9.81 ln (*Chl-a ug/l*) + 30.6
- Total phosphorus TSI = 14.42 ln (*TP ug/l*) + 4.15

The linear regressions for Carlson's TSI were calculated using data collected from thousands of lakes in and outside the U.S. The TSI represents absolute values that can be applied to most lakes to characterize their trophic status and general condition. A TSI value was calculated for each of the three variables collected from Lake Alma in 2016 (*Table **8***). Per Carlson's (1977) recommendation, average summer (July, August, September) chlorophyll-*a* and spring (April, May, June) total phosphorus TSI values were used to determine the final TSI value. Transparency based (Secchi depth) TSI values were calculated but Carlson warns against using transparency as a variable in waters with high non-algal turbidity, namely, sediment and silt (Carlson, 1980). Such is the case with many lakes and more specifically, reservoirs in Ohio.

Table 8 — Trophic state classification, TSI data and trends in trophic state for Lake Alma data from 2016 and 2017.

Site	Date	Chl. *a* (µg/L)	TSI Chl-*a*	SD (m) Raw Data	TSI SD	TP (µg/L)	TSI TP	Final TSI	Trophic Classification
Lake Alma L-1	6/30/2016	4.9	**46**	2.15	**49**	7.2	**33**	**37**	Oligotrophic
Lake Alma L-1	7/25/2016	5.5	**47**	1.82	**51**	7.0	**32**		
Lake Alma L-1	8/18/2016	32.2	**65**	2.0	**50**	8.5	**35**		
Lake Alma L-1	9/15/2016	158	**80**	0.95	**61**	11.2	**39**		
Lake Alma L-1	11/3/2016	16	**58**	2.69	**46**	6.5	**31**		
Lake Alma L-1	5/18/2017	3.94	**44**	2.95	**44**	9.7	**37**		
Lake Alma L-1	6/22/2017	4.36	**45**	3.39	**42**	12.3	**40**		
Lake Alma L-1	7/6/2017	4.84	**46**	3.33	**43**	14.2	**42**		
Lake Alma L-1	8/16/2017	0.365	**21**	2.49	**47**	3.7	**23**		
Lake Alma L-1	9/6/2017	65.5	**72**	0.81	**63**	9.6	**37**		

Since Ohio does not have a very robust baseline of lake data, the use of TSI as a general tool for trend assessment is appropriate. Based on data collected in 2016 and 2017, the final TSI for Lake Alma was calculated to be 37, which is lower than the 1980 TSI value of 42. Although there appears to be a slight increase in water quality based on trophic state analysis, both studies indicate the lake is not excessively productive and reflects a status bordering the oligotrophic/mesotrophic classification. Of the 199 public lakes classified in 1996 in the OWRI report, only 10 were classified oligotrophic. While nutrient availability in sediment and biomass is not considered, the TSI value shows there are not enough nutrients (TP) present in the water column to cause this lake to be considered nutrient enriched, since the TSI-TP values are almost all below the oligotrophic/nutrient-enriched threshold of 12.

Conclusions

Lake Alma constructed in 1903 is a medium size reservoir fed by two very small drainage areas. The residence time is about eight months at baseflow indicating the water entering the lake remains in the lake a short time. The turnover rate in Lake Alma is 150% which means that the lake's volume is replaced one and a half times each year. The challenges that exist in Lake Alma are symptomatic of a watershed impacted by nutrient loading. On July 25, 2016, the total nitrogen was 4.5 times the median target value of 350. The concentration tended to fluctuate throughout the summer. Total nitrogen was above the median target value eight out of ten samples.

Fortunately, bacteria levels in Lake Alma were very low, thus limiting the risk of acquiring pathogen-related diseases that can result from skin contact with the water. Analyses of sediment and water column samples indicated that the lake is free of heavy metal contamination. Finally, although algal bloom production was noted with cyanobacteria dominating the biomass, cyanotoxin test results did not reveal any toxins above the current advisory thresholds for recreation.

Lake Alma met standards aquatic life use based on the 2016-2017 chemical data as compared to the EWH criteria. Sport fish consumption should follow the statewide Ohio Sport Fish Consumption Advisory at ***https://www.epa.state.oh.us/dsw/fishadvisory/index#145214734-statewide***. Attainment of the recreation use was unknown due to insufficient data, but the five bacteria samples collected were at or below detection levels. The Public Drinking Water Supply Use does pertain to Lake Alma since Lake Alma is a public water supply for the City of Wellston. Federal, state and local stakeholders can utilize the information summarized in this report to help develop an appropriate lake or watershed management plan with a goal of decreasing internal and external nutrient load in Lake Alma.

References

Carlson, R. E. (1977, March). A trophic state index for lakes. *Limnology and Oceanography, 22*(2), 361-369.

Carlson, R. E. (1980, March). More complications in the chlorophyll-Secchi disk relationship. *Limnology and Oceanography, 25*(2), 379-382.

Cooke, G. D. (2005). *Restoration and Management of Lakes and Reservoirs* (Third ed.). New York, NY: CRC Press.

D'Anglada, L. (2016, October 25). *Cyanobacteria/Cyanotoxins*. Retrieved from USEPA - Nutrient Policy and Data: ***https://www.epa.gov/nutrient-policy-data/cyanobacteriacyanotoxins***

MacDonald, D. D., Ingersoll, C. G., & Berger, T. A. (2000, January 13). Development and Evaluation of Consensus-Based Sediment Quality Guidelines. *Archvies of Environmental Contamination and Toxicology, 39*, 20-31.

Ohio Department of Natural Resources. Lake Alma State Park History & Natural Features. http://parks.ohiodnr.gov/lakealma#history.

Ohio EPA. (1996). *Ohio Water Resource Inventory Volume 3: Ohio's Public Lakes, Ponds, & Reservoirs.* Retrieved from ***http://www.epa.state.oh.us/portals/35/documents/96vol3.pdf***

Ohio EPA. (2008, April). *Ohio Specific Sediment Reference Values.* Retrieved from Ohio EPA Division of Environmental Response and Revitalization Ecological Risk Assessment Guidance Document: ***http://www.epa.ohio.gov/portals/30/rules/rr-031.pdf***

Ohio EPA. (2015, July 31). *Surface Water Field Sampling Manual for Water Quality Parameters and Flows*. Retrieved from ***http://epa.ohio.gov/Portals/35/documents/SW%20Sampling%20Manual%202015%20Update%20Final%20Main.pdf***

Persuad, D., Jaagumagi, R., & Hayton, A. (1993, August). *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario.* Retrieved from Ontario Ministry of Environment and Energy: ***https://www.itrcweb.org/contseds-bioavailability/References/guide_aquatic_sed93.pdf***

Reckhow, K. H., & Chapra, S. C. (1983). *Engineering Approaches for Lake Management* (Vol. 1: Data analysis and empirical modeling). Boston, MA: Butterworth Publishers.

Rice, E., Baird, R., & Eaton, A. (2017). *Standard Methods for the Examination of Water and Wastewater* (23 ed.). American Public Health Association; American Water Works Association; Water Environment Federation.

State of Ohio. (2016). *State of Ohio Harmful Algal Bloom Response Strategy for Recreational Waters.* Retrieved from ***http://epa.ohio.gov/portals/35/hab/HABResponseStrategy.pdf***
Wetzel, R. G. (2001). *Limnology: Lake and River Systems* (Third ed.). San Diego, CA: Academic Press.

Lake Hope, 2016

Inland Lake Water Quality Report

Lake Hope 2016

Division of Surface Water
Inland Lakes Program
2019

Lake Hope

Inland Lake Water Quality Report

2019

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Introduction: Inland Lakes Monitoring

Ohio EPA has implemented a sampling strategy that focuses on evaluating chemical conditions near the surface and physical conditions in the water column of inland lakes. Physical profile measurements are summarized either for the entire water column or the epilimnion depending on the existence of thermal stratification. The sampling target consists of an even distribution of 5 sampling events divided over year period and collected during the recreation season of May 1 through October 31.

Key parameters analyzed in lakes include chlorophyll-*a*, ammonia, D.O., pH, total dissolved solids along with various metals for multiple beneficial use assessments. Other parameters used to evaluate lakes include Secchi depth, total phosphorus and total nitrogen. Details of the sampling protocol used at the time of this sampling are outlined in the ***2016 Inland Lakes Sampling Procedures Manual***. Sampling objectives for inland lake surveys are defined in Ohio EPA's Inland Lakes Sampling QAPP, and the rules relative to inland lakes beneficial uses are described in the 2010 and successive Water Quality Monitoring Integrated Reports.

Figure 1 — Location of Lake Hope in southeastern Ohio

Study Lake: Lake Hope

This lake report will describe the physical characteristics of Lake Hope and the watershed that feeds it. It will then discuss the physical, chemical and biological aspects that existed during the 2016 sampling effort. These sampling results are then applied to relevant beneficial uses, and a trend assessment is provided comparing 2016 results to data collected from Lake Hope in 1971 and 1975. Finally, lake management implications are discussed for potential water quality improvement strategies.

Lake Hope is located within the Lake Hope State Park and is owned and managed by the Ohio Department of Natural Resources. The lake is in Vinton County, on the north east part of the county, four miles north of the Village of Zaleski (Figure 1). An in-stream impoundment fed by Sandy Run, Lake Hope lies within the Town of Zaleski - Raccoon Creek watershed (hydrologic unit 05090101-02-05) and is within the Western Allegheny Plateau (WAP) ecoregion. It has a surface area of 120 acres and a maximum depth of 6.2 meters. The lake was built on Sandy Run, a tributary to Raccoon Creek at river mile 92.52. A 750 foot dam was placed near the mouth of Sandy Run, creating a 338 million-gallon lake that receives drainage from the 6336-acre watershed.

Lake Type:	**Dam/Permanent Impoundment[1]**
Ecoregion:	Western Allegheny Plateau (WAP)
Surface Area:	120 acres[1]
Length of Dam:	750 feet[1]
Storage Capacity:	*338.9 million gallons[1] (45.3 million ft3)
Shoreline:	5.7 miles
Watershed:	6336 acres
Maximum Depth:	6.2 meters (20 ft.)[2]

*at Principal Spillway Elevation
[1] ODNR Division of Water **(Ohio Department of Natural Resources, 2018)**
[2] Ohio EPA 2016 study data

Table 1 — Lake Hope Key Attributes

Physical Attributes

The L1 sampling location on Lake Hope is centered at GPS location 39.3206 latitude -82.3544 longitude (Figure 2). The "L1" naming convention indicates a primary sampling location that is deemed representative of the whole lake and is the location used to determine attainment status of applicable

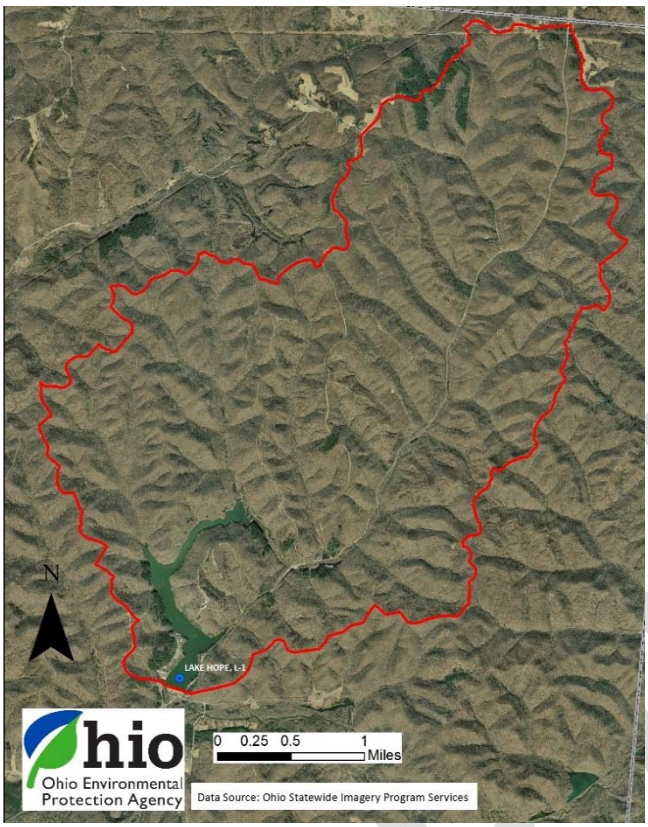


Figure 2. Aerial imagery of Lake Hope with location L-1 shown.

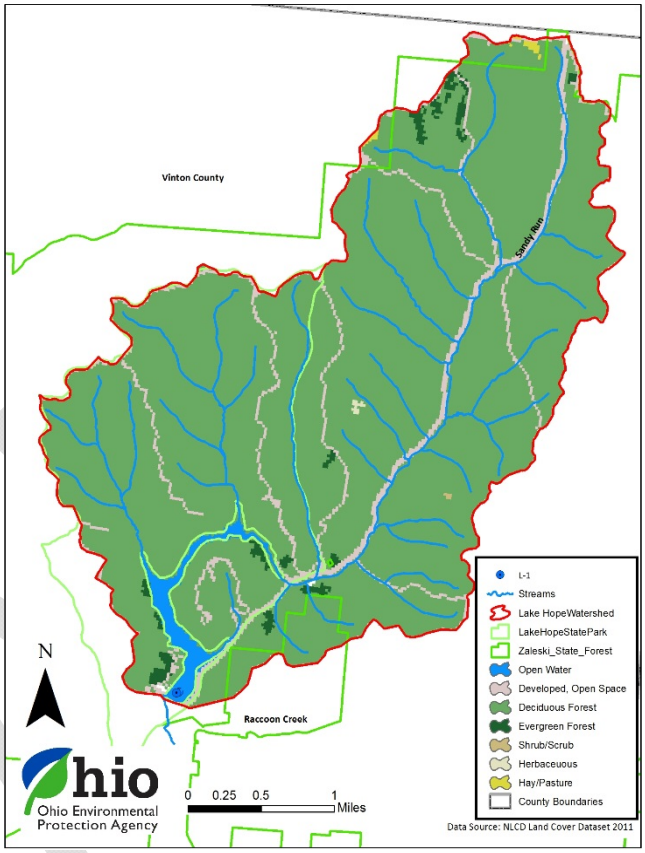


Figure 3. Land cover in the watershed draining to Lake Hope.

beneficial uses. Other locations (e.g. L2, L3 etc.) may be determined necessary to support attainment decisions on larger lakes and reservoirs. Constructed in 1937 by the ODNR Division of Forestry, Lake Hope is part of the 2,983-acre Lake Hope State Park and lies within Ohio's second largest state forest, the 28,614-acre Zaleski State Forest (ODNR Website). The Lake Hope watershed is ninety-six percent comprised of state park and state forest. Lake Hope State Park has a swimming beach and boat rental facility (pontoons, cones, kayaks and paddle boards). The park includes 187 camping sites, 66 cabins, a 24-guest Laurel Lodge and the Lake Hope dining lodge, all within the 2,983-acre park. The park and forest offer hiking, hunting, mountain biking and fishing. The park and lake are heavily used. There is a concrete public boat ramp located on the east side of the lake and an electric-motor-only restriction for motorboating.

Watershed Overview

Lake Hope dam is located on Sandy Run at river mile 0.39. The landscape is heavily wooded and is dominated by mixed oak forests. Land use within the Lake Hope is comprised of 92.5 percent forested areas, 5.58 percent development and 1.67 percent open water consisting entirely of roads and park areas i.e. picnic areas, campgrounds, beach and cabin/lodge areas.

The soils in the lower half valley of the watershed originate from loess and silty colluvium or old alluvium in valley fills formed by abandoned pre-glacial drainage systems. The soils surrounding Lake Hope itself are moderately to poorly well drained. The soils on the hillsides are well drained and originate from local bedrock. The Lake Hope area is moderately steep with a change in elevation of 340 feet.

Geological characteristics associated with the Lake Hope area are made up of Pennsylvanian-aged Allegheny and Pottsville Group (southern and western part of the watershed) and Conemaugh Group. The Conemaugh Group consists of shale, siltstone and mudstone with thin, discontinuous layers of coal. This group also contained sandstone which was used for buildings, bridge piers and iron furnaces. The Allegheny and Pottsville Group predominately consists of shale, siltstone and underclay and has extensive coal seams, some as much as 12 feet thick. The Allegheny and Pottsville Group also contains economically mined clay, iron ore and flint. Iron furnaces were common in the mid to late 1800s in this part of Vinton County. One of these furnaces operated in Zaleski and another called Hope Furnace existed just upstream of Lake Hope commencing production in 1854. Iron furnaces require three key ingredients for the production of cast iron; limestone, forests and iron ore, all found in the Lake Hope watershed. One furnace would require 325 acres of forest, each year, for the production of charcoal (Crowell, 1995). Hope Furnace produced 15 tons of cast iron per day when in production. The furnace ceased operations in 1875.

Coal mining within Lake Hope watershed began in the mid-1900's and comprised over 300-acres of underground mining in the upper portion of the watershed. Middle Kittanning #6 coal outcrops along the stream bed in the upper portion of the watershed and was the major coal seam mined. Drift mine entries were dug into the coal seam and coal was mined, up-dip, to allow for any water in the mine to drain out of the mine.

There are approximately 107 mine entries clustered in and around the Big Four Hollow tributary at Sand Run river mile 4.87, with more mine entries elsewhere in the watershed (US EPA 1973). Mine complexes' #88 and #47 produced the majority of the acid mine drainage (AMD) in Sandy Run. Coal refuse piles (gob) have been removed and/or buried in place to reduce the leaching of AMD. The largest gob piles were in Big Four and Honeycomb Hollows. Over 17,000 cubic yards of gob was removed and taken to a disposal site outside of the watershed. A total 13.7 acres of gob was buried in place and planted in grasses.

In 1979-1980, 35-drift mine entrances at mine complex #88 had hydraulic seals installed and a 1000-foot subsurface clay dike along to coal out-crop was constructed to reduce seepage. No immediate improvement in water quality was noted in Sand Run after the mine sealing project (Stoertz, *et. al*. 1999). The seals and dike were intended to flood the mine void which in turn would reduce the generation of acid mine drainage being discharged from the mine. An evaluation of the water quality and mine flooding was performed by Ohio University, Smalley and Assoc. and Ohio Department of Natural Resources Division of Mines and Reclamation in 1997 to determine the effectiveness of the mine entry sealing project and if an improvement in water quality was achieved. The water level in the sealed mine fluctuated seasonally with a recharge period during the wet season preceding a water level decline during the dry season due to leakage through the natural geology and/or mine seals and dike.

Water quality in Sand Run did improve after 18 years but this may be due in part to natural attenuation. The largest benefit to the mine sealing and capping of gob piles is the reduction of acid slugs that previously contributed to Lake Hope fish-kills. Compared to the early 1970s, an increase in pH from 3.6 SU to 7.5 SU was noted in Sand Run during 2016.

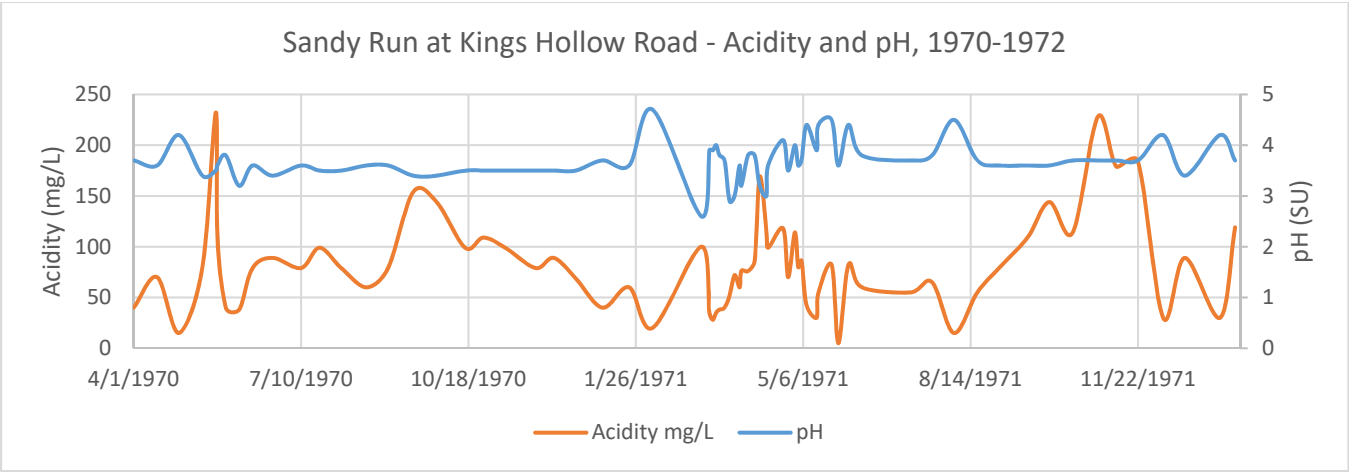


Figure 4. Sample results from Sandy Run at RM 2.7 in 1970 and 1971. (US EPA 1973)

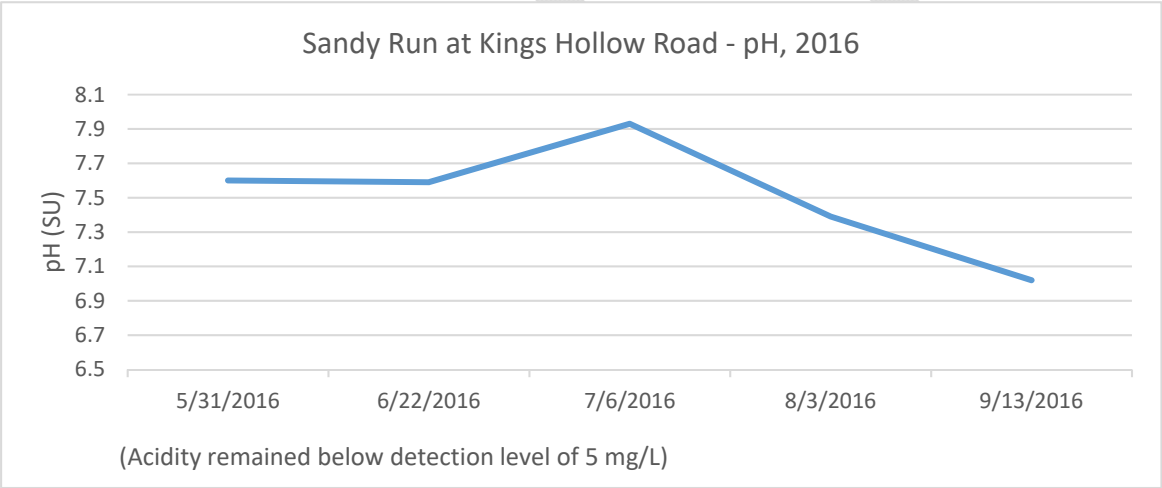


Figure 5. Sample results from Sandy Run at RM 2.7 in 2016.

Results Discussion

Water Column Chemistry

A physical profile of the water column was evaluated during each sampling event at the L1 sampling location at Lake Hope during 2016. Readings were recorded at the surface (which is defined as a 0.5-meter depth), at 0.5-meter intervals thereafter, and a final measurement at 0.5 meters above the bottom of the lake.

Physical conditions changed very little throughout the sampling season in this shallow lake, except for pH. Thermal stratification was prevalent throughout the sampling season. Thermal stratification occurs, more typically, in deep lakes during the warm summer months, consisting of an upper mixed zone (epilimnion), a slightly denser middle zone (metalimnion), and a lower zone (hypolimnion) where mixing is impeded by a density barrier caused by lower water temperatures near the bottom of a lake. A sharp decrease in temperature and dissolved oxygen is often noted where the hypolimnion forms. In Lake Hope, the water temperature, pH and dissolved oxygen decreased significantly through the water column. The largest thermal change in the water column was 17.6 °C (Figure 6), and dissolved oxygen reached hypoxic conditions in the last 2.0 meters of water during the summer. Additionally, pH in Lake Hope dropped below the minimum Water Quality Standard of 6.5 S.U. This occurred below the surface except during the September 6 sampling. During the middle two weeks of August 2016, the area received over two inches of rain which recharged the sealed mine. The mine slowly leaked AMD into Sand Run during September 2016 delivering a low flow high concentration of AMD to the lake. By late September 2016, the lake was approaching its neutral pH state near the surface.

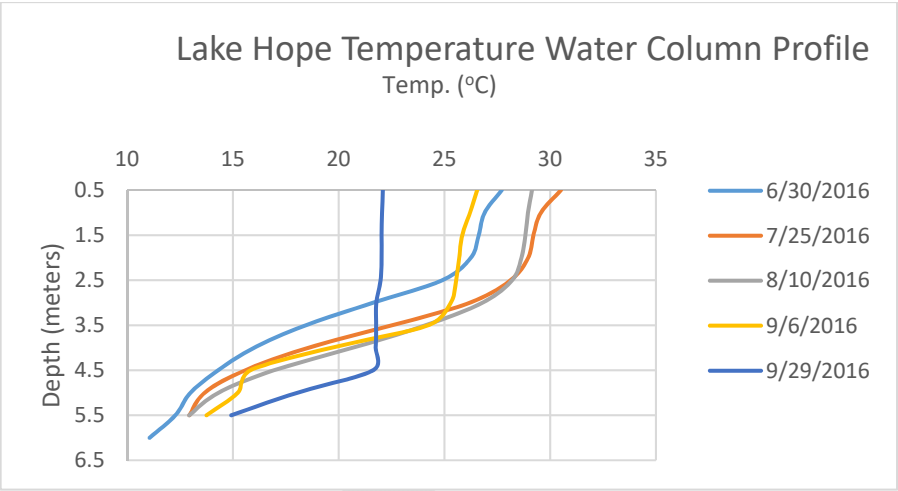


Figure 6 — Temperature profiles recorded in 2016.

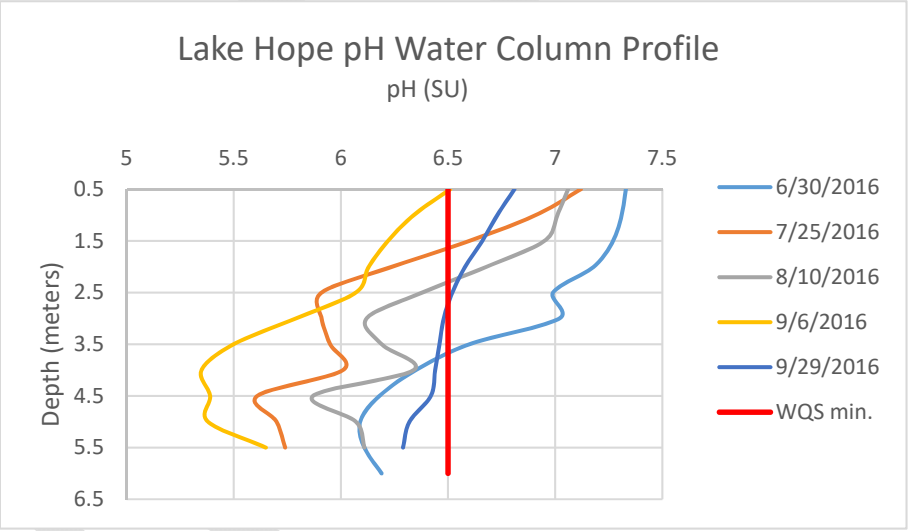


Figure 7 - pH profile recorded in 2016.

Fish access to habitat, cool water and benthic prey can be limited if any part of the water column becomes hypoxic, in addition to low pH. An oxygen deficit, defined for the purposes of this report as a concentration of 4 mg/L or less, was documented during each sampling event in 2016 at L1. The zone of oxygen deficit extended from the bottom of the lake to 3.5-meters in depth in September and 4.5 meters earlier in the sampling. Under these conditions, organically bound phosphate in lake sediments decomposes and is converted to orthophosphate (the biologically available form of phosphate) that is available for biological uptake. Because orthophosphate is a reactive form of phosphorus, its concentration is often a good

indication of the amount of phosphorus that is readily available for plant and algae growth. Orthophosphate averaged 5.0 ug/L during in 2016.

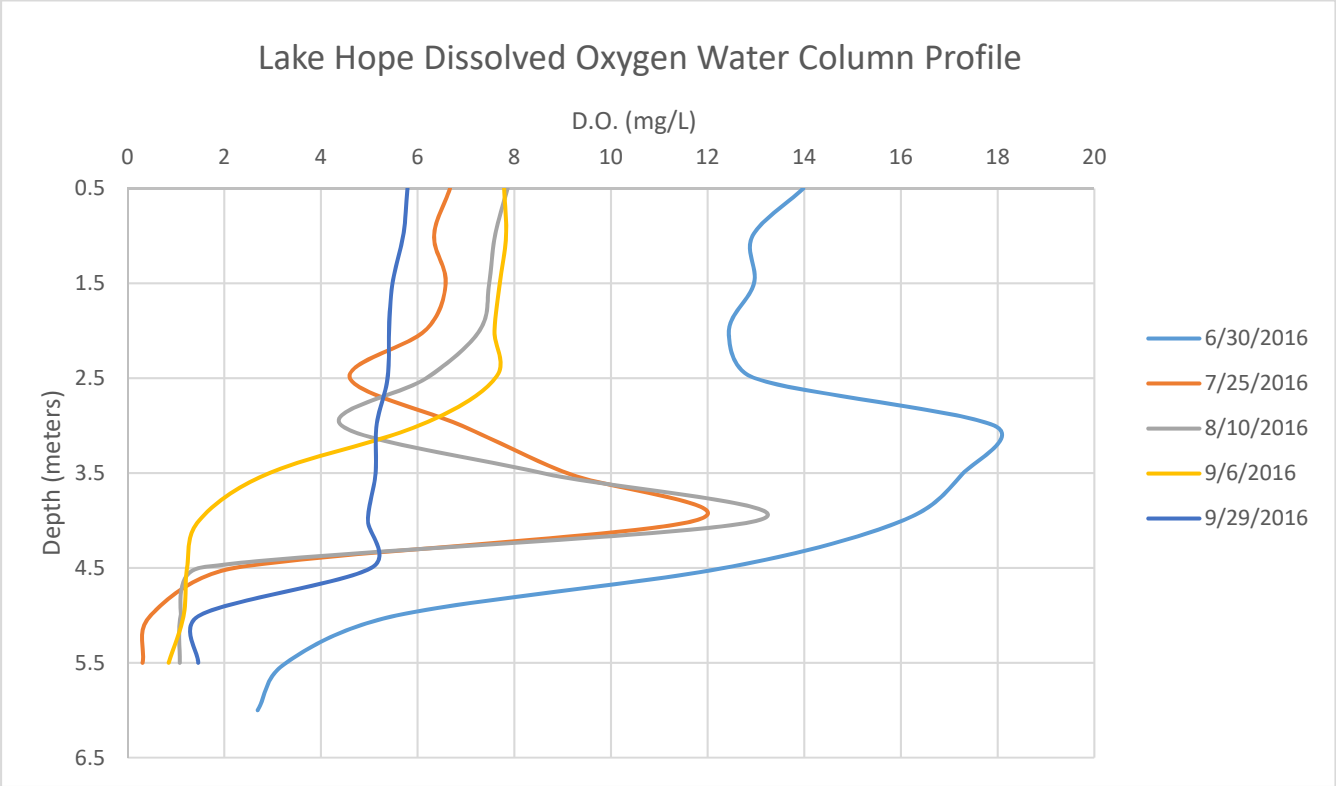


Figure 8. Dissolved oxygen profile in 2016.

Lake Hope transparency at L1 averaged 2.28 meters over the sampling period (median 2.34 m) reaching as high as 2.96 m. Dissolved oxygen levels in the epilimnion did not fall below the EWH inland lakes minimum criterion of 5.0 mg/l, and typically ranged from 6 mg/L to 14 mg/L due to the extensive amount of macrophytes in the lake (Table 3 and Figure 8).

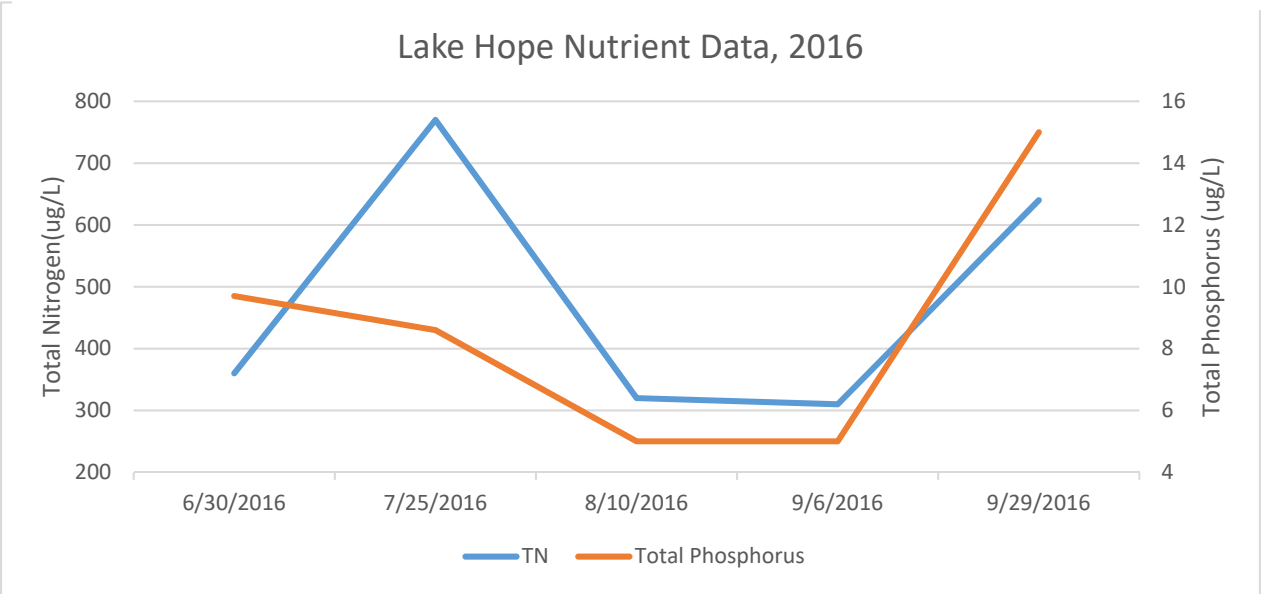
Table 2 — Dissolved oxygen concentration in Lake Hope during 2016.

Dissolved Oxygen Concentrations, Lake Hope L1 in 2016			
Parameter (mg/L)	D.O. (mg/L) - Surface	D.O. (mg/L) - Bottom	Mean D.O. (mg/L) – Whole Water Column
Aquatic Life Criterion	**≥5.0[1]**		
6/30/2016	13.98	2.69	12.9
7/25/2016	6.67	0.31	6.34
8/10/2016	7.86	1.08	7.28
9/6/2016	7.79	0.85	6.03
9/29/2016	5.79	1.46	5.15

Metals, nutrient and other physical parameters such as dissolved oxygen, pH, turbidity, and alkalinity were collected and analyzed from the surface at L1. The results were compared to the statewide EWH criteria and aquatic life use benchmarks. The only exceedances of the EWH criteria and aquatic life use benchmarks recorded during this sampling effort were pH and chlorophyll, respectively.

The amount of phosphorus in a lake is important because it is commonly the growth limiting nutrient. Sources of phosphorus to a lake can be external (i.e. tributary loading or precipitation) and internal (i.e. biota, sediment or groundwater). Only a small portion of organic phosphorus is available for biological

Figure 9. Lake Hope surface nutrient data for 2016.



uptake, but in dissolved ionic form (orthophosphate) it passes easily through membranes and is readily available. Decomposition of dead plants and animals releases inorganic phosphorus into the water column. Phosphorus bound to particulate matter in the sediment can also be released to the water column under hypoxic conditions if the bond is redox sensitive (i.e. iron or calcium).

Nutrient parameters were analyzed to help understand trophic dynamics in Lake Hope. Internal loading of phosphorus was determined to be a potential factor in this system. Total phosphorus concentration at the surface based on the five daytime sampling events averaged 5.00 µg/l while bottom mean concentration

[1] The dissolved oxygen criteria apply in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.

Figure 10 — Petite Ponar dredge for lake sediment sample collection (DSW-CDO).

was 22 µg/l. Although, dissolved orthophosphate averaged below the detectable limit of 1 ug/L at the bottom and at the surface.

The presence of nutrients, especially phosphorus, can stimulate the growth of algal blooms. Total nitrogen (TN) is the sum of total Kjeldahl nitrogen (TKN) and nitrate/nitrite and can be an important factor in systems that are nitrogen limited. TN values were more reflective of a mesotrophic (medium productivity) or even oligotrophic (low production) system throughout the sampling season **Error! Reference source not found.**(Wetzel, 2001).

Sediment Chemistry

A sediment grab sample was collected using a Petite Ponar dredge (Figure 10) on June 30, 2016 at L1 and was analyzed for metals, nutrients (Table 3), volatile organic compounds, PCBs and pesticides (organo-chlorine insecticides).

Sediment data were evaluated using *Ohio Sediment Reference Values (SRVs)* (Ohio EPA, 2008)along with guidelines established in *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* (MacDonald, Ingersoll, & Berger, 2000). Ohio EPA SRVs represent ecoregion background conditions for metals based on data collected at Ohio reference sites. These values were developed for lotic (flowing) water bodies and are based on Ohio ecoregions. Sediment concentrations for lentic (non-flowing) surface water bodies can be screened using these values. MacDonald guidelines define two levels of ecotoxic effects. A threshold effect concentration (TEC) is a level of sediment chemical quality below which harmful effects are unlikely to be observed and can be considered comparable to background conditions. A probable effect concentration (PEC) indicates a level above which harmful effects are likely to be observed. These guidelines include both metals and organic parameters.

Finally, guidelines established by the Ontario Ministry of the Environment (Persuad, Jaagumagi, & Hayton, 1993) were used to evaluate sediment sample results for total organic carbon (TOC) and total phosphorus (TP). These guidelines include the lowest effect level (LEL) and the severe effect level (SEL). The LEL is a level of sediment concentration that can be tolerated by a majority of benthic organisms. The SEL is a concentration considered harmful to most benthic organisms.

Table 3 — Chemical parameters measured above screening levels in samples collected by Ohio EPA from bottom sediments in Lake Hope, September 2017.

Parameter	L1 Concentration
TOC (%)	2.4
Arsenic (mg/kg)	**9.08**
Cadmium (mg/kg)	**0.689**
Chromium (mg/kg)	17.9
Copper (mg/kg)	**24.3**
Lead (mg/kg)	25.8
Nickel (mg/kg)	**34.8**
Selenium (mg/kg)	<2.1
Aluminum (mg/kg)	17,100
Barium (mg/kg)	178
Calcium (mg/kg)	<2100
Iron (mg/kg)	45,800

Parameter	L1 Concentration
Magnesium (mg/kg)	2690
Manganese (mg/kg)	532
Potassium (mg/kg)	<2100
Sodium (mg/kg)	<5260
Strontium (mg/kg)	<32
Zinc (mg/kg)	**165**
Ammonia (mg/kg)	190
T-Phosphorus (mg/kg)	**903**

< - not detected at or above the method reporting limit.
Contamination levels were determined for parameters using Ohio Sediment Reference Values (SRVs), consensus-based sediment quality guidelines (MacDonald, et.al. 2000) and guidelines from the Ontario Ministry of the Environment (Persuad et. al. 1993). Bold numbers indicate values above the Lowest Effect Level (LEL).

Organic compounds were undetected in the sediment sample collected at L1, and, thus, are not reported in Table 3. Arsenic, cadmium, copper, nickel, zinc and phosphorus exceeded the LEL, but were still below the SEL. Zinc and lead exceeded the TEC (Table 3).

Sediment nutrient concentrations were slightly elevated at L1. Additionally, the sediment sample result of 903 mg/kg TP exceeded the LEL of 600 mg/kg. This indicates a baseline concentration of phosphorus is present in the lake's sediment, further reinforcing that internal loading of phosphorus may be occurring which can contribute to algal bloom growth. Ohio EPA does not currently utilize a reference guideline for ammonia concentrations in sediment similar to the Ontario research-based thresholds for phosphorous or total organic carbon. The sediment concentration of ammonia at L1 was 190 mg/kg.

Phytoplankton Results

The phytoplankton community in Lake Hope was characterized based on water samples collected using an integrated tube sampler deployed to either a maximum of two meters (m) or twice the Secchi depth if less than one meter. Samples were collected at L1 during the first, third and last sampling events in 2016. Samples were preserved with Lugol's solution and submitted to BSA Environmental Services, Inc. for analysis. The phytoplankton present in a representative aliquot were identified to at least genus level (usually species) in accordance with *Standard Methods for the Examination of Water and Wastewater* Method No. 10200 (American Public Health Association 2012), and cell densities (cells/L) and bio-volumes (μm^3/L) were then estimated. Phytoplankton communities exhibit a seasonal succession when factors like water temperature, nutrients, transparency and photoperiod favor certain types. Grazing by larval fish and zooplankton also affects community composition. Temperate lakes in Ohio are usually dominated by diatoms (Bacillariophyta) in the spring until micronutrients like silica are depleted, then by blue green algae (cyanobacteria) in the fall, when an ability to control buoyancy and fix nitrogen from the atmosphere gives certain types a competitive edge.

The phytoplankton population at Lake Hope L1 contained eight different classes of algae in all the samples collected. Cyanobacteria represented about 3.17 percent of the total biovolume of phytoplankton during the early summer of 2016 with diatoms and dinoflagellates (*Pyrrohyta*) making up 76.35 and 15.99 percent, respectively. This trend shifted in August 2016 with blue-green algae comprising 37.4 percent of the total biovolume and diatoms making up 16.78 percent, while dinoflagellates increased to 28.66 percent. When breaking down the results by sampling event, the total biovolume of cyanobacteria increased sharply by mid-summer but dramatically decreased by September to 0.82 percent. This decrease in cyanobacteria coincides with a decrease in lake pH late in September and is replaced by *Raphidophyta* at 36.67 percent.

These potentially toxic algae are one cause of "red tide" that is toxic to fish. The increase in *Raphidophyta* may be driven by the increase in iron concentration in the lake.

A community dominated by cyanobacteria is of concern when toxin-producing phytoplankton are present. Discussion of cyanotoxin sampling results is contained below in the Recreation Use Assessment section. Genera of phytoplankton that can produce cyanotoxins identified within the samples collected at Lake Hope included *Aphanizomenon, Aphanocapsa, Cylindrospermopsis*, *Dolichospermum* (fka: *Anabaena*), Merismopedia, *Planktonlyngbya and Plantothrix* (D'Anglada, 2016). The toxin producing cyanobacteria made-up 33 to 99 percent of the blue-green algae species in each phytoplankton sample. Seasonal phytoplankton succession in reservoirs can be quite complicated and highly variable. This variability can even exist longitudinally, with completely different communities dominating the upper, middle and lower sections of larger reservoirs (Wetzel, 2001). However, the existence of toxin producing cyanobacteria along with a major shift toward cyanobacteria dominance are symptomatic of a nutrient enriched system. A breakdown of the seasonal phytoplankton composition is presented in Figure 11.

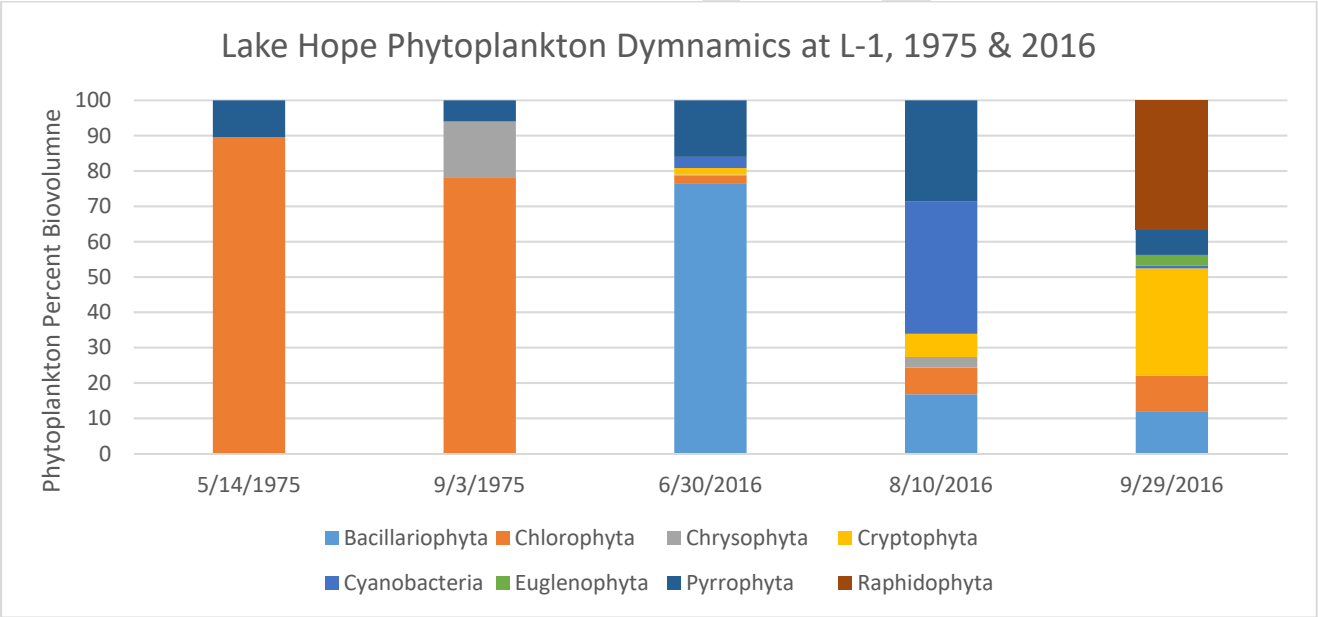


Figure 11 — Phytoplankton dynamics at Lake Hope during 1975 and 2016.

Beneficial Use Assessment

Public Drinking Water Use Assessment

Like all public lakes in Ohio (except Piedmont Reservoir), Lake Hope is designated a public water supply (PWS) in the Ohio WQS. However, Lake Hope is currently not being used as a public water supply.

Table 4 — 2016 E. coli results.

Parameter	E. coli (CFU/100 mL)
Bathing Water Criterion	**126 PCR/410 STV**
7/18/2016	10
7/26/2016	<10
8/11/2016	<10

8/16/2016	30
8/17/2016	10
Geomean	**10**

Recreation Use Assessment

Ohio conducts a monitoring and notification program of selected public and semi-private beaches to test the water quality and notify the public whenever bacteria and algal toxin levels present a potential health risk to those engaged in water activities. In support of this monitoring program, bacteria and algal toxin concentrations were examined to determine suitability for Primary Contact Recreation use (PCR). *Escherichia coliform* (*E. coli*) bacteria were measured close to the bathing beach, just north of the L1 station.

This site was sampled five times over the assessment period. The geometric mean value for *E. coli* was compared to the bathing water (waters heavily used for swimming) criterion of 126 CFU/100 mL of sample. Furthermore, each data point was also compared to the Statistical Threshold Value (STV) of 410 CFU/100 mL using a minimum of five sampling results in a 90 day period. The geometric mean of this data was 10.0 CFU/100 mL, well below the PCR criterion, and none of the data points were above the STV**.** (Table 4). In addition to this data, Ohio DNR samples E.coli levels at state-owned beaches on a weekly basis during the recreation season. Any exceedances of the PCR or STV would trigger a beach advisory based on ODNR samples.

Standards for algal toxin concentrations are currently being developed, but the State of Ohio has established thresholds for recreational advisories. For public beaches, a recreational public health advisory is posted when a possible harmful algal bloom (HAB) is visually confirmed and/or when cyanotoxin levels are equal to or exceed recreational public health advisory thresholds, whether or not a HAB is still present. An elevated recreational public health advisory (no contact) is posted when cyanotoxin levels are equal to or exceed the elevated recreational public health advisory thresholds (State of Ohio, 2016).

Samples were collected and analyzed for microcystin, saxitoxin and cylindrospermopsin on first, third and fifth sampling events at L1 during 2016. The results for all toxin samples were below the current advisory thresholds for recreation water for all three toxins, indicating safe algal toxin levels based upon these advisories. Anatoxin was not analyzed during this survey (Table 5).

Table 5 — Summary of data used to determine the recommended advisory thresholds for cyanotoxins in recreational waters.

Parameter (µg/L)	Cylindrospermopsin	Microcystins	Saxitoxin
Proposed Criterion (Advisory)	**5**	**6**	**0.8**
Proposed Criterion (No Contact)	**20**	**20**	**3**
6/30/2016	< 0.5 U-	< 0.3 U-	< 0.022 U-
8/10/2016	< 0.5 U-	< 0.3 U-	< 0.022 U-
9/29/2016	< 0.5 U-	< 0.3 U-	0.045
% Over Threshold	**0**	**0**	**0**
Narrative	**support**	**support**	**Support**

J: The analyte was positively identified; the associated numerical value is estimated.
U+: The reported value is between the laboratory method detection limit and the reporting limit.
U-: The reported value is less than the laboratory method detection limit

Human Health - Fish Consumption

Ohio has been sampling streams annually for sport fish contamination since 1993. Fish are analyzed for contaminants that bioaccumulate in fish and that could pose a threat to human health if consumed in excessive amounts. Contaminants analyzed in Ohio sport fish include mercury, PCBs, DDT, mirex, hexachlorobenzene, lead, selenium and several other metals and pesticides. Other contaminants are sometimes analyzed if indicated by site-specific current or historic sources.

The last time Lake Hope was sampled for fish tissue was in summer, 2005. Though the data is considered historic (> 10 years old), largemouth bass should not be eaten more than once per month due to mercury levels at that time. No other consumption advisories have been issued beyond the statewide advisory for mercury as a result of that sampling effort. Fish tissue has not been collected recently at Lake Hope. Statewide fish consumption advisories can be found at ***epa.ohio.gov/dsw/fishadvisory/index.aspx***.

Aquatic Life Use Assessment

The aquatic life use (ALU) designation for all inland lakes in Ohio is exceptional warmwater habitat (EWH) except for upground reservoirs which are designated warmwater habitat (WWH). In order to evaluate the ALU in Lake Hope, ammonia, dissolved oxygen, pH, total dissolved solids and various metals were analyzed. Statewide water quality criteria for these parameters are summarized in Table 35-1 of the Ohio water quality standards. Other important parameters for assessing lake condition in Lake Hope included nutrient parameters (e.g. total phosphorus, total nitrogen) and biological response variables (e.g. chlorophyll-a).

Where criteria do not exist, a common approach to assessing relative lake condition is to compare lake water quality sampling data to a regional and lake type derived percentile (e.g. 25th) of existing lake data. The lower 25th percentile generally represents minimally impacted conditions protective of designated uses. For Ohio EPA, inland lake aquatic life use benchmarks were calculated for total nitrogen (T-N), total phosphorus (T-P) and chlorophyll-a (Chl. a) based on the lower 25th percentile of lake median data and for secchi depth based on the upper 75th percentile of lake median data. All data used for benchmarks were collected by Ohio EPA from Ohio inland lakes between 1989 and 2006.

Lake samples were collected from near the surface of Lake Hope five times in 2016 during the recreation seasons. Statewide Outside Mixing Zone Average (OMZA) water quality criteria listed in tables 35-1 through 35 of section 3745-1-35 of the OAC (Water Quality Standards) were used for most parameters to evaluate the existing EWH designated use for Lake Hope. Dissolved Oxygen is compared against the statewide OMZ Minimum criteria. Sampling results revealed that Lake Hope did exceed the minimum WQC for pH, so it is in non-attainment for EWH for that parameter (Table 6). Furthermore, neither Secchi, nitrogen or phosphorous metrics met their target values for nutrient enrichment (Table 6).

Table 6 — Summary of important Lake Hope data.

Aquatic Life Use Benchmarks							
Parameter	Chl. a (µg/L)	Secchi (m)	TN (µg/L)	TP (µg/L)	D.O. (mg/L)	pH (SU)	NH3-N (mg/l)
ALU Benchmarks	**≤6.2 median**	**2.16 min**	**≤350 median**	**≤14 median**	**≥5.0**	**6.5>pH<9.0**	**(WQS)**
6/30/2016	3.1	2.16	360	9.7	13.0	7.27	<0.05
7/25/2016	4.0	2.34	770	8.6	6.1	6.6	<0.05
8/10/2016	13.7	2.38	320	5.0	7.28	6.95	<0.05
9/6/2016	11.2	2.96	310	5.0	6.78	6.13	<0.05
9/29/2016	8.9	1.57	640	15	5.3	6.52	<0.05
Median	**8.9**	**2.34**	**360**	**5.0**			

Trend Assessment

Ohio EPA conducted a detailed assessment of chemical, physical and biological conditions of Raccoon Creek watershed and its tributaries during the summer of 2016 to determine if the streams within the watershed were attaining water quality goals. The survey revealed that Raccoon Creek possessed good water quality with few exceedances of Ohio WQS. Iron exceeded the WQS of 5,000 mg/l, due to past mining. Ammonia

was in exceedance of the WQS downstream stream of some of the waste water treatment plants. Dissolved oxygen was below the minimum WQS, mostly due to slow moving water. Specific conductivity and total dissolved solids exceeded the WQS due exclusively to past coal mining. There were some elevated bacteria counts were found throughout the watershed, likely due to sewage discharges from unsewered areas, inadequate manure management and unrestricted cattle access to streams. Three sites were assessed downstream from Lake Hope, on Raccoon Creek located at RM 29.2, RM 22.0 and RM 10.2. All three sites attained the Exceptional Warmwater Habitat aquatic life use.

Lake Hope was assessed in May and August 1978 and April and August 1990 as a part of a Section 314 Clean Lakes Assessment Grant. This data was summarized in the 1982 *305(b) Report* and eventually integrated into Volume 3 of the 1996 *Ohio Water Resource Inventory 305(b) Report*, which can be found at ***epa.ohio.gov/portals/35/documents/96vol3.pdf*** (Ohio EPA, 1996). The report describes trophic state index (TSI) as one of several metrics used to assess the condition of Ohio's public lakes. Carlson's TSI is a numerical representation of a lake's state of productivity along a scale of 0 to 100. Each major division (10, 20, 30, etc.) represents a doubling in algal biomass based on transparency, total phosphorus and chlorophyll-*a* measurements (Carlson, 1977). Unproductive, oligotrophic lakes score on the lower end of the scale, mesotrophic lakes are in the middle and eutrophic/hyper-eutrophic lakes occupy the upper end of the continuum. In 1990, Lake Hope (L-1) was determined to have a final TSI of 43.0, a mesotrophic condition. The previous year, 1989, Lake Hope (L-2) had a TSI of 46.0, again mesotrophic. It is worth noting that the Ohio Water Resources Inventory 305(b) Report indicates lake are eutrophic if the TSI is between 48 and 66.

The Carlson TSI values were calculated in the same manner as in the 1990 *Ohio 305(b) Lakes Report*, using formulas from Reckhow and Chapra (Reckhow & Chapra, 1983) as follows:

- Secchi disk TSI = 60 - 14.41 ln (*SD meters*)
- Chlorophyll-*a* TSI = 9.81 ln (*Chl-a ug/l*) + 30.6
- Total phosphorus TSI = 14.42 ln (*TP ug/l*) + 4.15

The linear regressions for Carlson's TSI were calculated using data collected from thousands of lakes in and outside the U.S. The TSI represents absolute values that can be applied to most lakes to characterize their trophic status and general condition. A TSI value was calculated for each of the three variables collected from Lake Hope in 2016 (*Table 7*). Per Carlson's (1977) recommendation, average summer (July, August, September) chlorophyll-*a* and spring (April, May, June) total phosphorus TSI values were used to determine the final TSI value. Transparency based (Secchi depth) TSI values were calculated but Carlson warns against using transparency as a variable in waters with high non-algal turbidity, namely, sediment and silt (Carlson, 1980). Such is the case with many lakes and more specifically, reservoirs in Ohio.

Table 7 — Trophic state classification, TSI data and trends in trophic state for Lake Hope data from 2016.

Site	Date	Chl. *a* (µg/L)	TSI Chl-*a*	SD (m)	TSI SD	TP (µg/L)	TSI TP	Final TSI	Trophic Classification
Lake Hope L-1	6/30/2016	3.1	**41.7**	2.16	**48.9**	9.7	**36.9**	**41**	Mesotrophic
Lake Hope L-1	7/25/2016	4.0	**44.2**	2.34	**47.75**	6.6	**31.4**		
Lake Hope L-1	8/10/2016	13.7	**56.28**	2.38	**47.51**	6.95	**32.1**		
Lake Hope L-1	9/6/2016	11.2	**54.3**	2.96	**44.36**	6.13	**30.3**		
Lake Hope L-1	9/29/2016	8.9	**52.05**	1.57	**53.5**	6.52	**31.2**		

Since Ohio does not have a very robust baseline of lake data, the use of TSI as a general tool for trend assessment is appropriate. Based on data collected in 2016, the final TSI for Lake Hope was calculated to be 41, which is lower than the 1990 TSI value of 43. Although there appears to be a slight increase in water quality based on trophic state analysis, both studies indicate the lake is not excessively productive and reflects a status reflecting an oligotrophic/mesotrophic classification. While nutrient availability in sediment and biomass is not considered, the TSI value shows there are not enough nutrients (TP) present in the water column to cause this lake to be considered nutrient enriched, since the TSI-TP values are almost all below the oligotrophic/nutrient-enriched threshold of 12.

Conclusions

Lake Hope, constructed in 1937, is a medium size reservoir fed Sandy Run. The residence time is 53 days at baseflow indicating the water entering the lake remains in the lake a short time. The turnover rate in Lake Hope occurs every 53 days at baseflow which means the lake's volume is replaced every two months. The short residence time may also dampen the effects of the AMD coming into lake. The challenges that exist in Lake Hope are symptomatic of a watershed impacted by nutrient loading further exacerbated by AMD. The exceedance of the aquatic life use benchmarks was an elevated median concentration of chlorophyll-*a.* The concentration tended to increase as the summer progressed, while transparency decreased at the end of the sampling season (Table 7). The results of these two parameters suggested that algal production was amplified later in the summer. The production of cyanobacteria increased to 37.4% of the phytoplankton but was drastically reduced in September and replaced by *Raphidophyta*, a red tide causing plankton. The decreasing of pH in the lake may have caused the replacement of the cyanobacteria with *Raphidophyta*.

TN levels were slightly elevated with respect to the aquatic life use benchmarks, while TP results from the bottom sample had a median value of 22 mg/L. This suggests that the TP source is internal loading from sediment. Less than one percent of land use dedicated to agriculture. In a hypoxic environment, this source of internal nutrient loading initiates and promotes algal bloom activity and is a source of nutrients for the many macrophytes.

Fortunately, bacteria levels in Lake Hope were very low, thus limiting the risk of acquiring pathogen-related diseases that can result from skin contact with the water. Analyses of sediment and water column samples indicated that the lake is free of heavy metal contamination. Finally, although algal bloom production was noted with cyanobacteria dominating the biomass, cyanotoxin test results did not reveal any toxins above the current advisory thresholds for recreation.

Lake Hope did not meet standards for aquatic life use based on 2016 chemical data as compared to the EWH criteria. Sport fish consumption should follow the statewide Ohio Sport Fish Consumption Advisory at ***https://www.epa.state.oh.us/dsw/fishadvisory/index#145214734-statewide*** as no specific advisories were added. Attainment of the recreation use was unknown due to insufficient data, but the five bacteria samples collected were below or just above the detection levels. The Public Drinking Water Supply Use does not pertain to Lake Hope since Lake Hope is not used as a public water supply. Federal, state and local stakeholders can utilize the information summarized in this report to help develop an appropriate lake or watershed management plan with a goal of decreasing internal and external nutrient load, and ultimately slowing the rate of eutrophication in Lake Hope.

References

Carlson, R. E. (1977, March). A trophic state index for lakes. *Limnology and Oceanography, 22*(2), 361-369.

Carlson, R. E. (1980, March). More complications in the chlorophyll-Secchi disk relationship. *Limnology and Oceanography, 25*(2), 379-382.

Cooke, G. D. (2005). *Restoration and Management of Lakes and Reservoirs* (Third ed.). New York, NY: CRC Press.

D'Anglada, L. (2016, October 25). *Cyanobacteria/Cyanotoxins*. Retrieved from USEPA - Nutrient Policy and Data: ***https://www.epa.gov/nutrient-policy-data/cyanobacteriacyanotoxins***

MacDonald, D. D., Ingersoll, C. G., & Berger, T. A. (2000, January 13). Development and Evaluation of Consensus-Based Sediment Quality Guidelines. *Archvies of Environmental Contamination and Toxicology, 39*, 20-31.

Ohio Department of Natural Resources. *Lake Hope State Park History & Natural Features.* http://parks.ohiodnr.gov/lakealma#history.

Ohio EPA. (1996). *Ohio Water Resource Inventory Volume 3: Ohio's Public Lakes, Ponds, & Reservoirs.* Retrieved from ***http://www.epa.state.oh.us/portals/35/documents/96vol3.pdf***

Ohio EPA. (2008, April). *Ohio Specific Sediment Reference Values.* Retrieved from Ohio EPA Division of Environmental Response and Revitalization Ecological Risk Assessment Guidance Document: ***http://www.epa.ohio.gov/portals/30/rules/rr-031.pdf***

Ohio EPA. (2015, July 31). *Surface Water Field Sampling Manual for Water Quality Parameters and Flows*. Retrieved from ***http://epa.ohio.gov/Portals/35/documents/SW%20Sampling%20Manual%202015%20Update%20Final%20Main.pdf***

Persuad, D., Jaagumagi, R., & Hayton, A. (1993, August). *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario.* Retrieved from Ontario Ministry of Environment and Energy: ***https://www.itrcweb.org/contseds-bioavailability/References/guide_aquatic_sed93.pdf***

Reckhow, K. H., & Chapra, S. C. (1983). *Engineering Approaches for Lake Management* (Vol. 1: Data analysis and empirical modeling). Boston, MA: Butterworth Publishers.

Rice, E., Baird, R., & Eaton, A. (2017). *Standard Methods for the Examination of Water and Wastewater* (23 ed.). American Public Health Association; American Water Works Association; Water Environment Federation.

State of Ohio. (2016). *State of Ohio Harmful Algal Bloom Response Strategy for Recreational Waters.* Retrieved from ***http://epa.ohio.gov/portals/35/hab/HABResponseStrategy.pdf***

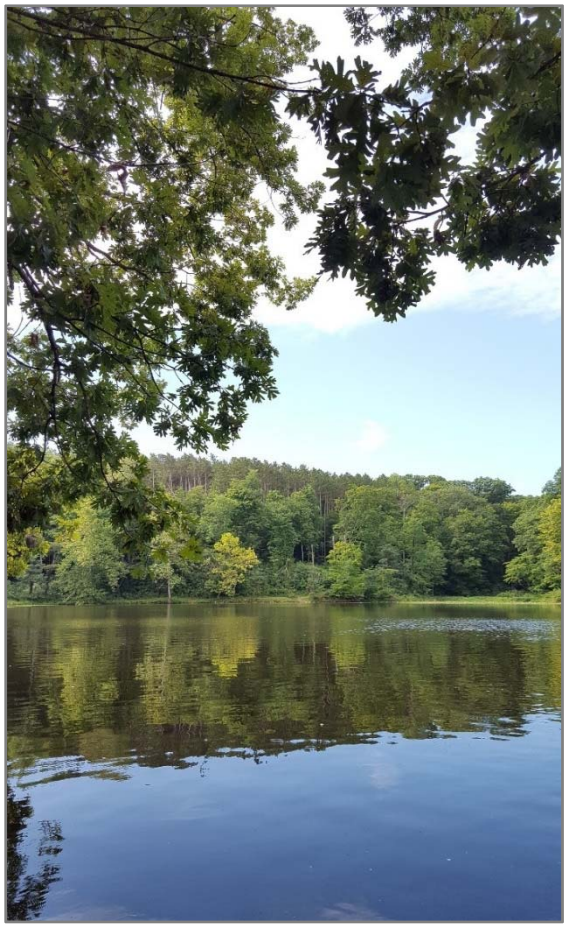
Stoertz, M. W., Hughes, M. L., Wanner, N. S., Farley, M. E. (1999). *Hydraulic sealing of an abanded up-dip drift mine for AMD treatment: An 18-year post-audit.* ***https://wvmdtaskforce.files.wordpress.com/2016/01/99-stoertz.pdf***

US EPA. (1973). *Feasibility Study Lake Hope Mine Drainage Demonstration Project.* US EPA National Research Center, Cincinnati, Ohio.

Wetzel, R. G. (2001). *Limnology: Lake and River Systems* (Third ed.). San Diego, CA: Academic Press.

Tycoon Lake, 2016

Inland Lake Water Quality Report



Lake Rupert

Division of Surface Water
Inland Lakes Program
2019

Tycoon Lake

Inland Lake Water Quality Report

2019

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Introduction: Inland Lakes Monitoring

Ohio EPA has implemented a sampling strategy that focuses on evaluating chemical conditions near the surface and physical conditions in the water column of inland lakes. Physical profile measurements are summarized either for the entire water column or the epilimnion depending on the existence of thermal stratification. The sampling target consists of an even distribution of five sampling events over a one-year period and collected during the recreation season of May 1 through October 31.

Key parameters analyzed in lakes include chlorophyll-*a*, ammonia, D.O., pH, total dissolved solids along with various metals for multiple beneficial use assessments. Other parameters used to evaluate lakes include secchi depth, total phosphorus and total nitrogen. Details of the sampling protocol used at the time of this sampling are outlined in the ***2016 Inland Lakes Sampling Procedures Manual***. Sampling objectives for inland lake surveys are defined in Ohio EPA's Inland Lakes Sampling QAPP, and the rules relative to inland lakes beneficial uses are described in the 2010 and successive Water Quality Monitoring Integrated Reports.

Figure 1 — Location of Tycoon Lake in southeastern Ohio

Study Lake: Tycoon Lake

This lake report will describe the physical characteristics of Tycoon Lake and the watershed that feeds it. It will then discuss the physical, chemical and biological aspects that existed during the 2016 sampling effort. These sampling results are then applied to relevant beneficial uses, and a trend assessment is provided comparing 2016 results to data collected from Tycoon Lake during 1990. Finally, lake management implications are provided for potential water quality improvement strategies.

Tycoon Lake is located within the Tycoon Lake Wildlife Area and is owned and managed by the Ohio Department of Natural Resources. It is located in Gallia County, about 3.5 miles north of the village of Rio Grande (Figure 1). An in-stream impoundment fed by two unnamed tributaries to Raccoon Creek, Tycoon Lake lies within the Barren Creek-Raccoon Creek watershed (hydrologic unit 05090101-06-02) and is within the Western Allegheny Plateau (WAP) ecoregion. It has a surface area of 183 acres and a maximum depth of 7 meters. The lake was built in a pre-Illinoian glacier stream channel by placing the main dam (1460 feet) at the southern unnamed tributary (UNT) and placing the Tycoon Lake East Dike at the northern UNT, creating a 183 acre lake contained within a 1.7-square mile watershed (Ohio Department of Natural Resources, 2018) (Table 1).

Table 1 — Tycoon Lake Key Attributes

Lake Type:	**Dam/Permanent Impoundment[1]**
Ecoregion:	Western Allegheny Plateau (WAP)
Surface Area:	183 acres[1]
Length of Dam:	1460 & 1100 feet[1]
Storage Capacity:	*797 million gallons[1] (106 million ft3)
Shoreline:	3.3 miles
Watershed:	1.7 square miles

Maximum Depth:	7 meters (22.75 ft.)[2]

*at Principal Spillway Elevation
[1] ODNR Division of Water Resources- Dam Safety
[2] Ohio EPA 2016 study data

Physical Attributes

The L1 sampling location on Tycoon Lake is approximately mid-lake, centered at GPS location 38.9269 latitude -82.3536 longitude (see Figure 2). The "L1" naming convention indicates a primary sampling location that is deemed representative of the whole lake and is the location used to determine attainment status of applicable beneficial uses. Other locations (e.g. L2, L3 etc.) may be determined necessary to support attainment decisions on larger lakes and reservoirs. Constructed in 1960, Tycoon Lake is managed solely for recreation fishing. Tycoon Lake is a no-wake lake and does not have a beach. It is a popular fishing destination for nearby residents, as well as tourists. There is a concrete public boat ramp located on the south side of the lake and the lake also features a handicap accessible fish pier.

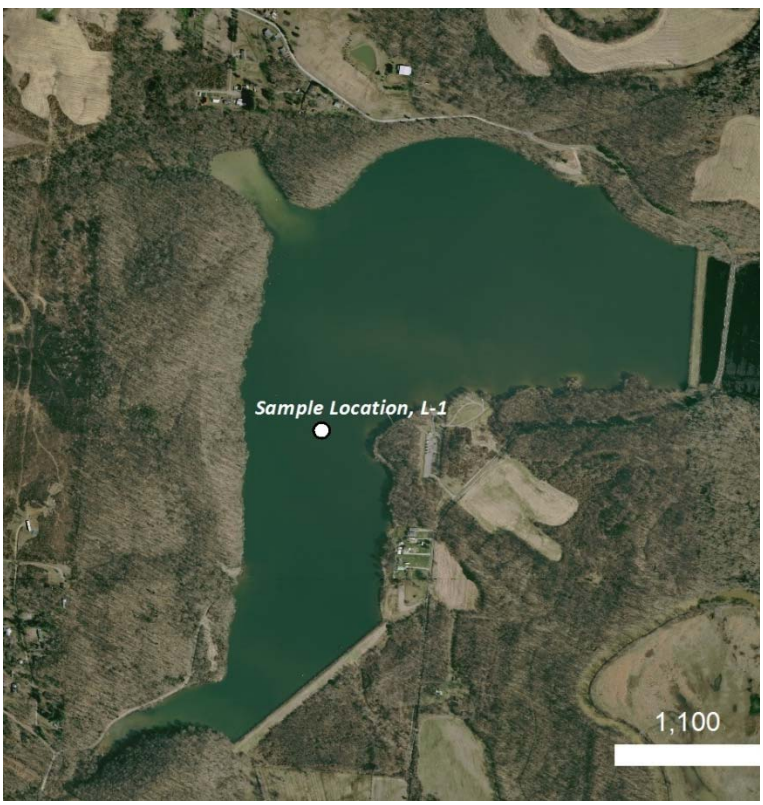

Figure 2 — Aerial imagery of Tycoon Lake with location of L1 shown. Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

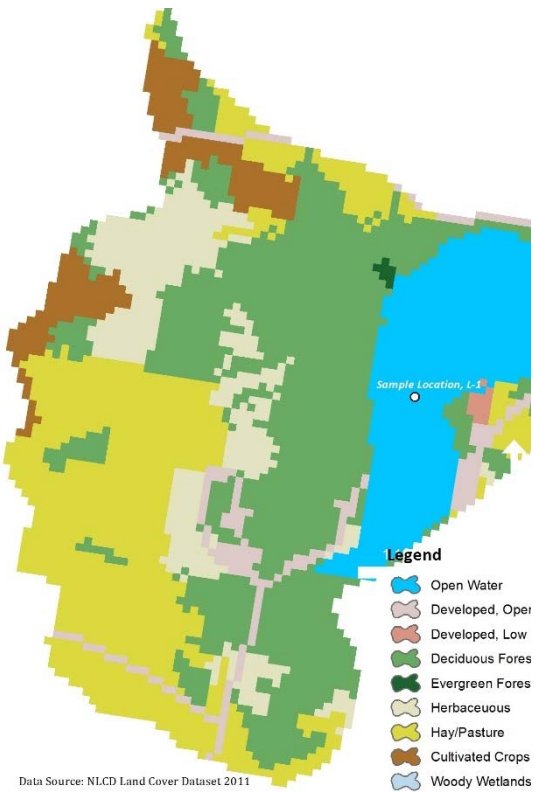

Figure 3 — Land cover in the watershed draining to Tycoon Lake.

Watershed Overview

The unnamed tributaries that feed Tycoon Lake enter Raccoon Creek at RMs 33.3 and 34.63. The two UNTs drain approximately 1.7 square miles, 61 percent of which makes up the Lake Tycoon Wildlife Area. The landscape is heavily wooded and is dominated by mixed oak forests. Land use within the Lake Tycoon watershed is comprised of 31.5 percent agriculture (almost entirely hay and grazing) and 34.8 percent

forested areas. The remaining 33.65 percent is composed of open water (17.3 percent), grassland areas/ clear-cut logging, (10.9 percent), developed and open spaces (5.3 percent), and wetlands (0.15 percent). (Figure 3).

Geological characteristics associated with the Tycoon Lake area are made up of Pennsylvanian-aged Conemaugh Group - shale, siltstone, and mudstone. The pre-Illinoian glacier stream channel that contains Tycoon Lake is comprised of lacustrine deposits of Minford clays and silt often covered with a thin colluvial sand, silt and gravel. The Tycoon Lake area is moderately hilly with a change in elevation of only 120 feet. The soils surrounding Tycoon Lake itself are moderately to poorly well drained.

Results Discussion

Water Column Chemistry

A physical profile of the water column was evaluated during each sampling event in 2016 at the L1 sampling location at Tycoon Lake. Readings were recorded at the surface (which is defined as a 0.5-meter depth), at 0.5-meter intervals thereafter, with a final measurement collected at 0.5 meters above the bottom of the lake.

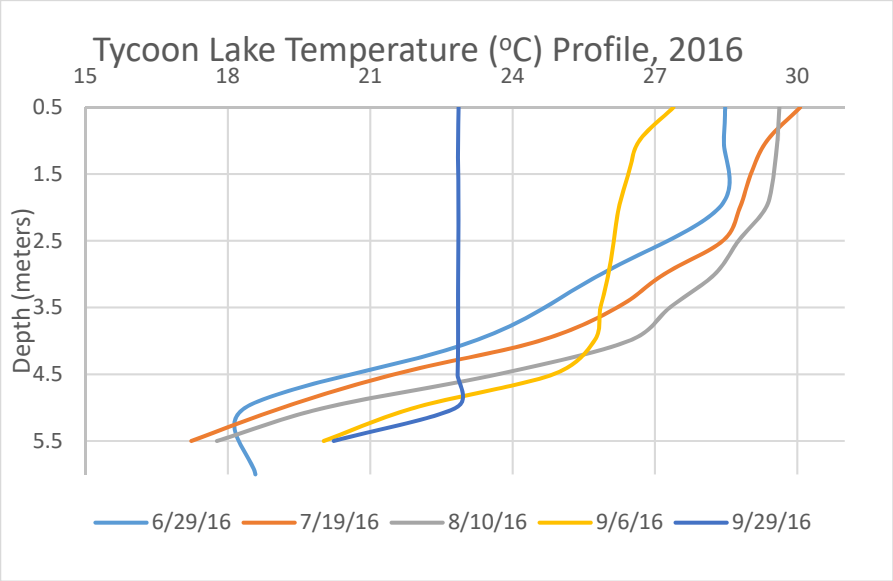

Figure 4 — Temperature profiles recorded during the summer of 2016.

Physical conditions changed throughout the sampling season in this relatively shallow lake. Stratification occurred early in the sampling season and ended in late summer. Thermal stratification occurs in deep lakes during the warm summer months, consisting of an upper mixed zone (epilimnion), a slightly denser middle zone (metalimnion), and a lower zone (hypolimnion) where mixing is impeded by a density barrier caused by lower water temperatures near the bottom of a lake. A sharp decrease in temperature and dissolved oxygen is often noted where the hypolimnion forms. However, in the case of Tycoon Lake, water temperature and dissolved oxygen decreased steadily through the water column, with a somewhat sharper drop-off near the bottom of the lake, indicating the presence of a small, abbreviated hypolimnion (Figure 4). The hypolimnion of productive lakes can become depleted of oxygen (hypoxic) if consumption by decomposing organic matter exceeds reaeration by atmospheric diffusion and photosynthesis. Dissolved oxygen levels in the metalimnion and epilimnion can swing significantly over a 24-hour period under such conditions.

Fish access to habitat, cool water and benthic prey can be limited if any part of the water column becomes hypoxic. An oxygen deficit, defined for the purposes of this report as a concentration of 4 mg/L or less, was documented during all but one sampling event at L1. The zone of oxygen deficit extended from the bottom

of the lake to 3.0-meters in depth. Under these conditions, organically bound phosphate in lake sediments decomposes and is converted to orthophosphate (the biologically available form of phosphate), is available for biological uptake. Because orthophosphate is a reactive form of phosphorus, its concentration is often a good indication of the amount of phosphorus that is readily available for plant and algae growth. Although, orthophosphate was below the detectable limit of 1.0 ug/L.

Tycoon Lake transparency at L1 averaged 0.97 meters over the sampling period (median 0.895 m). Low Secchi readings in Tycoon Lake were likely caused by algal growth and suspended solids in this shallow, productive lake environment. Profile data indicated dissolved oxygen trending downward as summer progressed, likely resulting from lack of inflow and increasing water temperatures. Dissolved oxygen levels in the epilimnion did not fall below the EWH inland lakes minimum criterion of 5.0 mg/l, although bottom DO concentrations and average DO concentrations through the entire water column were consistently lower during most of the summer (*Table 2***Error! Reference source not found.**). The dissolved oxygen criterion of 5.0 mg/l applies in the epilimnion of stratified lakes, and throughout the water column in unstratified lakes.

Table 2 — Dissolved oxygen concentration in Tycoon Lake during 2016.

Dissolved Oxygen Concentrations, Tycoon Lake L1 2016			
Parameter (mg/L)	D.O. (mg/L) - Surface	D.O. (mg/L) - Bottom	Mean D.O. (mg/L) – Whole Water Column
Aquatic Life Criterion	**≥5.0[1]**		
6/29/2016	10.52	12.09	6.46
7/19/2016	12.18	4.88	9.04
8/10/2016	9.16	0.81	4.9
9/6/2016	9.33	0.74	4.86
9/29/2016	5.86	1.2	5.15

Metals, nutrient and other physical parameters such as dissolved oxygen, pH, turbidity, and alkalinity were collected and analyzed from the surface at L1. The results were compared to the statewide EWH criteria and aquatic life use benchmarks. No exceedances were recorded during this sampling effort.

The amount of phosphorus in a lake is important because it is commonly the growth limiting nutrient. Sources of phosphorus to a lake can be external (i.e. tributary loading or precipitation) and internal (i.e. biota, sediment or groundwater). Only a small portion of organic phosphorus is available for biological uptake, but in dissolved ionic form (orthophosphate) it passes easily through membranes and is readily available. Decomposition of dead plants and animals releases inorganic phosphorus into the water column. Phosphorus bound to particulate matter in the sediment can also be released to the water column under anoxic conditions if the bond is redox sensitive (i.e. iron or calcium).

Nutrient parameters were analyzed to help understand trophic dynamics in Tycoon Lake. Internal loading of phosphorus was determined to be a potential factor in this system. Total phosphorus concentration at the surface based on the five sampling events averaged 25.04 µg/l while bottom mean concentration was 46.8 µg/l. Dissolved orthophosphate was not detected at the bottom nor at the surface sample.

The presence of nutrients, especially phosphorus, can stimulate the growth of algal blooms. This process may be exacerbated during autumn when thermal stratification degrades and the lake experiences the

[1] The dissolved oxygen criteria apply in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.

complete mixing associated with fall turnover. Total nitrogen (TN) is the sum of total Kjeldahl nitrogen (TKN) and nitrate/nitrite and can be an important factor in systems that are nitrogen limited. TN values were more reflective of a mesotrophic (medium productivity) or even oligotrophic (low production) system in May and June and then steadily increased during the summer of 2016, culminating in a 2,510.0 µg/l measurement in late September (**Error! Reference source not found.**). This result is more indicative of a eutrophic to hyper-eutrophic (highly productive) system that often experience seasonal shifts in phytoplankton structure (Wetzel, 2001).

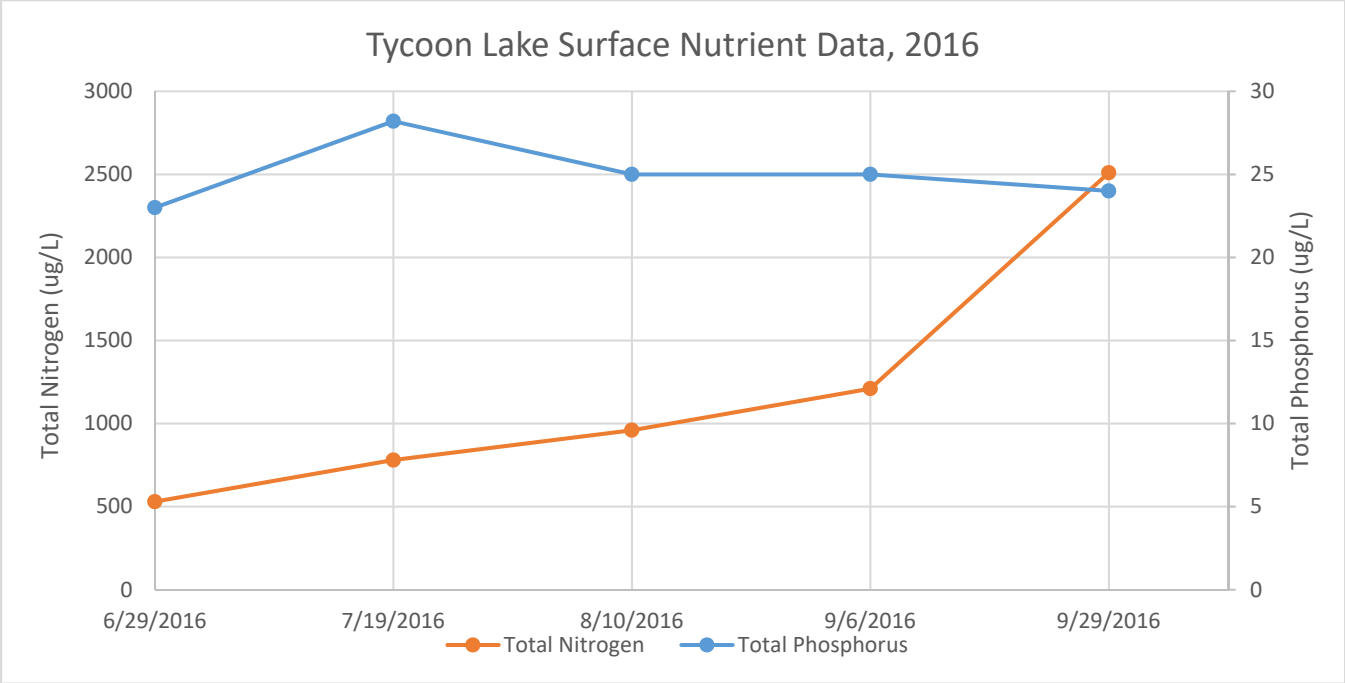

Figure 5. Tycoon Lake surface nutrient data for 2016.

Figure 6 — Use of a Petite Ponar dredge for lake sediment sample collection (CDO-DSW).

Sediment Chemistry

A sediment grab sample was collected using a Petite Ponar dredge during July 2016 at L1 and was analyzed for metals, nutrients, volatile organic compounds, PCBs and pesticides (organo-chlorine insecticides) (Figure 6) (Table 3).

Sediment data were evaluated using *Ohio Sediment Reference Values (SRVs)* (Ohio EPA, 2008) along with guidelines established in *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* (MacDonald, Ingersoll, & Berger, 2000). Ohio EPA SRVs represent ecoregion background conditions for metals based on data collected at Ohio reference sites. These values were developed for lotic (flowing) water bodies and are based on Ohio ecoregions. Sediment concentrations for lentic (non-flowing) surface water bodies can be screened using these values. MacDonald guidelines define two levels of ecotoxic effects. A threshold effect concentration (TEC) is a level of sediment chemical quality below which harmful effects are unlikely to be observed and can be considered comparable to background

conditions. A probable effect concentration (PEC) indicates a level above which harmful effects are likely to be observed. These guidelines include both metals and organic parameters.

Finally, guidelines established by the Ontario Ministry of the Environment (Persuad, Jaagumagi, & Hayton, 1993) were used to evaluate sediment sample results for total organic carbon (TOC) and total phosphorus (TP). These guidelines include the lowest effect level (LEL) and the severe effect level (SEL). The LEL is a level of sediment concentration that can be tolerated by a majority of benthic organisms. The SEL is a concentration considered harmful to most benthic organisms.

Organic compounds were undetected in the sediment sample collected at L1, and, thus, are not reported in Table 3. Concentrations of metals were below the Ohio SRVs for the Western Allegheny Plateau ecoregion. Cadmium, chromium, copper, lead, and manganese exceeded the LEL, but were still below the SEL. Arsenic, nickel and zinc exceeded both the TEC and LEL, but were also still below the PEC and SEL. Thus, the sediment sample collected at L1 did not contain metals in concentrations exceeding the paired, more protective reference value (the PEC or the SEL) (Table 3).

Table 3 — Chemical parameters measured above screening levels in samples collected by Ohio EPA from bottom sediments in Tycoon Lake, July 2016.

Parameter	L1 Concentration
TOC (%)	**3.5**
Arsenic (mg/kg)	14.3
Cadmium (mg/kg)	0.917
Chromium (mg/kg)	28.3
Copper (mg/kg)	**24**
Lead (mg/kg)	32.1
Nickel (mg/kg)	**45.7**
Selenium (mg/kg)	<2.57
Aluminum (mg/kg)	34800
Barium (mg/kg)	350
Calcium (mg/kg)	2800
Iron (mg/kg)	**53800**
Magnesium (mg/kg)	3790
Manganese (mg/kg)	**2570**
Potassium (mg/kg)	3670
Sodium (mg/kg)	<6430
Strontium (mg/kg)	<39
Zinc (mg/kg)	**191**
Mercury (mg/kg)	<0.076
Ammonia (mg/kg)	160
T-Phosphorus (mg/kg)	**893**

B - Method blank contamination. The associated method blank contains the target analyte at a reportable level.
ND - not detected at or above the method reporting limit.
Contamination levels were determined for parameters using Ohio Sediment Reference Values (SRVs), consensus-based sediment quality guidelines (MacDonald, et.al. 2000) and guidelines from the Ontario Ministry of the Environment (Persuad et. al. 1993). Bold numbers indicate values above the Lowest Effect Level (LEL).

Sediment nutrient concentrations were slightly elevated at L1. The sample result of 3.5 percent for TOC exceeded the LEL of 2.5 percent. Additionally, the sediment sample result of 893 mg/kg TP exceeded the LEL of 600 mg/kg. This indicates a baseline concentration of phosphorus is present in the lake's sediment, further reinforcing that internal loading of phosphorus may be occurring and contributing to algal bloom growth. Ohio EPA does not currently utilize a reference guideline for ammonia concentrations in sediment

similar to the Ontario research-based thresholds for phosphorous or total organic carbon. The sediment concentration of ammonia at L1 was 160 mg/kg.

Phytoplankton Results

The phytoplankton community in Tycoon Lake was characterized based on water samples collected using an integrated tube sampler deployed to either a maximum of two meters (m) or twice the Secchi depth if less than one meter. Samples were collected at L1 during three of the five sampling events (June, August and September). Samples were preserved with Lugol's solution and submitted to BSA Environmental Services, Inc. for analysis. The phytoplankton present in a representative aliquot were identified to at least genus level (usually species), in accordance with *Standard Methods for the Examination of Water and Wastewater* Method No. 10200 (American Public Health Association 2012). Cell densities (cells/L) and bio-volumes (μm^3/L) were then estimated. Phytoplankton communities exhibit a seasonal succession when factors like water temperature, nutrients, transparency and photoperiod favor certain types. Grazing by larval fish and zooplankton also affects community composition. Temperate lakes in Ohio are usually dominated by diatoms (Bacillariophyta) in the spring until micronutrients like silica are depleted, then by blue green algae (cyanobacteria) in the fall, when an ability to control buoyancy and fix nitrogen from the atmosphere gives certain types a competitive edge.

The phytoplankton population at L1 contained six to seven different classes of algae in all samples collected. Cyanobacteria represented about 36.15 percent of the total biovolume of phytoplankton during the early summer with diatoms and green algae (Chlorophyta) making up 25.06 and 21.77 percent, respectively. When breaking down the results by sampling event, the total biovolume of cyanobacteria increased sharply throughout the summer. The August and September phytoplankton samples were comprised of 88.56 and 90.10 percent cyanobacteria.

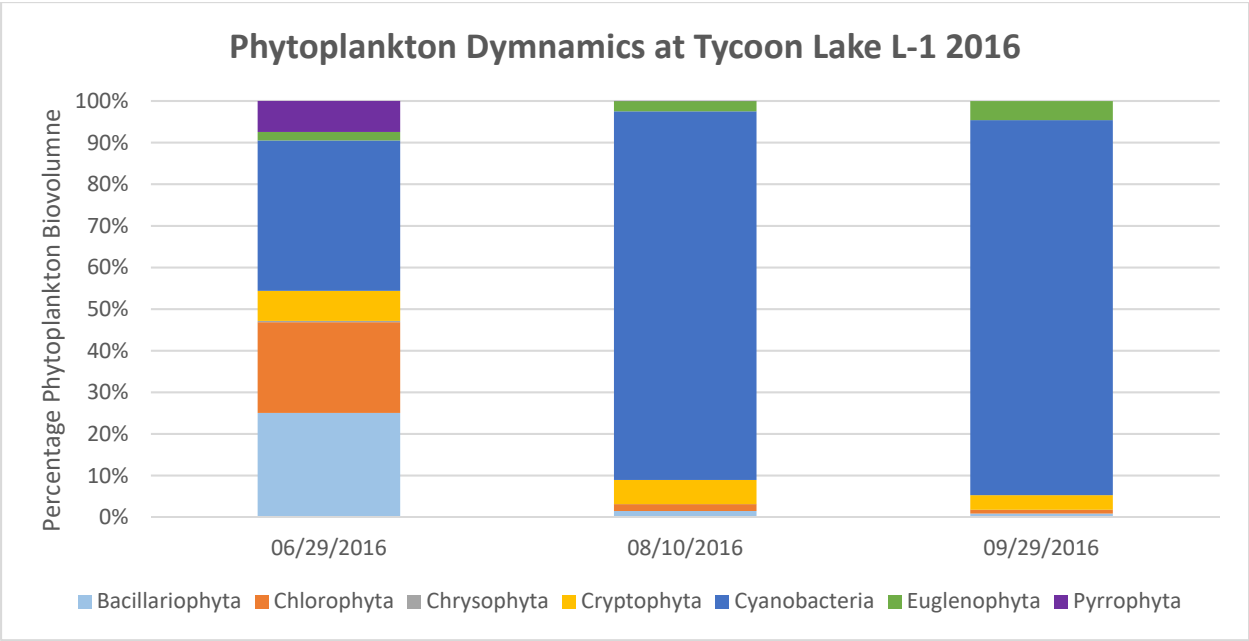

Figure 7 — Phytoplankton dynamics at Tycoon Lake during 2016.

A community dominated by cyanobacteria is of concern when toxin-producing phytoplankton are present. Discussion of cyanotoxin sampling results is contained below in the Recreation Use Assessment section. Genera of phytoplankton that can produce cyanotoxins identified within the samples collected at Tycoon

Lake included *Aphanizomenon, Cylindrospermopsis*, *Dolichospermum* (fka: *Anabaena*), *Microcystis, and Planktonlyngbya* (D'Anglada, 2016). Seasonal phytoplankton succession in reservoirs can be quite complicated and highly variable. This variability can even exist longitudinally, with completely different communities dominating the upper, middle and lower sections of larger reservoirs (Wetzel, 2001). However, the existence of toxin producing cyanobacteria along with a major shift toward cyanobacteria dominance are symptomatic of a eutrophic (nutrient enriched) system. A breakdown of the seasonal phytoplankton composition is presented in Figure 7.

Beneficial Use Assessment

Public Drinking Water Use Assessment

Like all public lakes in Ohio (except Piedmont Reservoir), Tycoon Lake is designated a public water supply (PWS) in the Ohio WQS. However, Tycoon Lake does not serve as a public drinking water supply (PDWS) source.

Recreation Use Assessment

Ohio conducts a monitoring and notification program of selected public and semi-private beaches to test the water quality and notify the public whenever bacteria and algal toxin levels present a potential health risk to those engaged in water activities. In support of this monitoring program, bacteria and algal toxin concentrations were examined to determine suitability for Primary Contact Recreation (PCR) use. *Escherichia coliform* (*E. coli*) bacteria were measured at the boat ramp. This site was sampled four times over the assessment period.

Parameter	E. coli (CFU/100 mL)
Bathing Water Criterion	**126 PCR / 410 STV**
7/18/2016	<10
7/26/2016	10
8/16/2016	10
8/17/2016	<10
Geomean	**10**

The geometric mean value for *E. coli* results was compared to the Primary Contact Recreation (PCR) criterion of 126 CFU/100 mL. Furthermore, each data point was also compared to the Statistical Threshold Value (STV) of 410 CFU/100 mL using a minimum of five sampling results in a 90 day period. The geometric mean of this data was 7.0 CFU/100 mL, well below the PCR criterion, and none of the data points were above the STV. However, since only four samples were collected, there was insufficient data to verify Tycoon Lake attained the recreation use for PCR.

Standards for algal toxin concentrations are currently being developed, but the State of Ohio has established thresholds for recreational advisories. For public beaches, a recreational public health advisory is posted when a possible harmful algal bloom (HAB) is visually confirmed and/or when cyanotoxin levels are equal to or exceed recreational public health advisory thresholds, whether or <u>not</u> a HAB is still present. An elevated recreational public health advisory (no contact) is posted when cyanotoxin levels are equal to or exceed the elevated recreational public health advisory thresholds (State of Ohio, 2016).

Samples were collected and analyzed for microcystin, saxitoxin and cylindrospermopsin on three of the five events at L1 during 2016. The results for all toxin samples were below the current advisory thresholds for

recreation water for all three toxins, indicating safe levels based upon these advisories. Anatoxin was not analyzed during this survey (Table 5).

Table 5 — Summary of data used to determine the recommended advisory thresholds for cyanotoxins in recreational waters

Parameter (µg/L)	Microcystin	Cylindrospermopsin	Saxitoxin
Proposed Criterion (Advisory)	**6**	**5**	**0.8**
Proposed Criterion (No Contact)	**20**	**20**	**3**
6/29/2016	0.34	<0.05	<0.022
8/10/2016	0.65	<0.05	<0.022
9/29/2016	0.34	<0.05	<0.022
% Over Threshold	**0**	**0**	**0**
Narrative	**support**	**support**	**support**

Human Health - Fish Consumption

Ohio has been sampling streams annually for sport fish contamination since 1993. Fish are analyzed for contaminants that bioaccumulate in fish and that could pose a threat to human health if consumed in excessive amounts. Contaminants analyzed in Ohio sport fish include mercury, PCBs, DDT, mirex, hexachlorobenzene, lead, selenium and several other metals and pesticides. Other contaminants are sometimes analyzed if indicated by site-specific current or historic sources.

Fish tissue sampling was conducted on Tycoon Lake during summer 2018. A new consumption advisory was implemented as a result of that effort. In conjunction with the standing statewide advisories, black crappie, bluegill, and channel catfish should be eaten no more than once every two weeks due to mercury levels. In a separate sampling effort in 1999, fish tissue samples were collected and analyzed for fish consumption advisory determination (PCB, pesticide and heavy metal contamination). No consumption advisories were issued beyond the statewide advisory for mercury as a result of this sampling effort. Statewide fish consumption advisories can be found at ***epa.ohio.gov/dsw/fishadvisory/index.aspx***.

Aquatic Life Use Assessment

The aquatic life use (ALU) designation for all inland lakes in Ohio is exceptional warmwater habitat (EWH) except for upground reservoirs which are designated warmwater habitat (WWH). In order to evaluate the ALU in Tycoon Lake, ammonia, dissolved oxygen, pH, total dissolved solids and various metals were analyzed. Statewide water quality criteria for these parameters are summarized in Table 35-1 of the Ohio water quality standards. Other important parameters for assessing lake condition in Tycoon Lake included nutrient parameters (e.g. total phosphorus, total nitrogen) and biological response variables (e.g. chlorophyll-a).

Where criteria do not exist, a common approach to assessing relative lake condition is to compare lake water quality sampling data to a regional and lake type derived percentile (e.g. 25th) of existing lake data. The lower 25th percentile generally represents minimally impacted conditions protective of designated uses. For Ohio EPA, inland lake aquatic life use benchmarks were calculated for total nitrogen (T-N), total phosphorus (T-P) and chlorophyll-a (Chl. a) based on the lower 25th percentile of lake median data and for secchi depth based on the upper 75th percentile of lake median data. All data used for benchmarks were collected by Ohio EPA from Ohio inland lakes between 1989 and 2006.

Lake samples were collected from near the surface of Tycoon Lake five times during the 2016 recreation season. Statewide Outside Mixing Zone Average (OMZA) water quality criteria listed in tables 35-1 through

35 of section 3745-1-35 of the OAC (Water Quality Standards) were used for most parameters to evaluate the existing EWH designated use for Tycoon Lake. Dissolved Oxygen is compared against the statewide OMZ Minimum criteria.

The median chlorophyll-*a* concentration of 24.8 µg/l exceeds aquatic life use benchmark of 6.2 µg/l and pH was above the WQS of 9.0 S.U. in twenty percent of the samples for this ecoregion and lake type. Furthermore, neither Secchi, nitrogen or phosphorous metrics met their benchmarks (*Table **6***). There were no exceedances of EWH chemical criteria based on the results from samples collected in the epilimnion of Tycoon Lake during the summer of 2016.

Table 6 — Summary of important lake data collected in Tycoon Lake.

Aquatic Life Use Benchmarks							
Parameter	Chl. a (µg/L)	Secchi (m)	TN (µg/L)	TP (µg/L)	D.O. (mg/L)	pH (SU)	NH3-N (mg/l)
ALU Benchmarks	**≤6.2 median**	**2.16 min**	**≤350 median**	**≤14 median**	**≥5.0**	**6.5>pH<9.0**	**(WQS)**
6/29/2016	8.5	1.325	530	15.2	10.1	9.1	<0.05
7/19/2016	34.4	1.06	780	23	12.2	9.1	<0.05
8/10/2016	64.4	0.895	960	28.2	8.2	8.1	<0.05
9/6/2016	89.2	0.73	1210	25	6.4	7.0	<0.05
9/29/2016	24.8J	0.85	2510	25	5.5	6.6	<0.05
Median	**24.8**	**0.895**	**960**	**24.5**			

Trend Assessment

Ohio EPA conducted a detailed assessment of chemical, physical and biological conditions of Raccoon Creek watershed and its tributaries during the summer of 2016 to determine if the streams within the watershed were attaining water quality goals. The survey revealed that Raccoon Creek possessed good water quality with few exceedances of Ohio WQS. Iron exceeded the WQS of 5000 mg/l, possibly due to past mining. Ammonia was in exceedance of the WQS downstream stream of some of the wastewater treatment plants. Dissolved oxygen was below the minimum WQS, mostly due to slow moving water. Specific conductivity and total dissolved solids exceeded the WQS due exclusively to past coal mining. There were some elevated bacteria counts were found throughout the watershed, likely due to sewage discharges from unsewered areas, inadequate manure management and unrestricted cattle access to streams. Three sites were assessed downstream from Tycoon Lake, on Raccoon Creek located at RM 29.2, RM 22.0 and RM 10.2. All three site were recommended for the Exceptional Warmwater Habitat aquatic life use.

Tycoon Lake was assessed in May and August 1978 and April and August 1990 as a part of a Section 314 Clean Lakes Assessment Grant. This data was summarized in the 1982 *305(b) Report* and eventually integrated into Volume 3 of the 1996 *Ohio Water Resource Inventory 305(b) Report*, which can be found at ***epa.ohio.gov/portals/35/documents/96vol3.pdf*** **(Ohio EPA, 1996)**. The report describes trophic state index (TSI) as one of several metrics used to assess the condition of Ohio's public lakes. Carlson's TSI is a numerical representation of a lake's state of productivity along a scale of 0 to 100. Each major division (10, 20, 30, etc.) represents a doubling in algal biomass based on transparency, total phosphorus and chlorophyll-*a* measurements (Carlson, 1977). Unproductive, oligotrophic lakes score on the lower end of the scale, mesotrophic lakes are in the middle and eutrophic/hyper-eutrophic lakes occupy the upper end of the continuum. In 1990, Tycoon Lake was determined to have a final TSI of 58.0, a eutrophic condition. It

is worth noting that the Ohio Water Resources Inventory 305(b) Report indicates lake are hyper-eutrophic if the TSI is greater than 66.

The Carlson TSI values were calculated in the same manner as in the 1990 *Ohio 305(b) Lakes Report*, using formulas from Reckhow and Chapra (Reckhow & Chapra, 1983) as follows:

- Secchi disk TSI = 60 - 14.41 ln (*SD meters*)
- Chlorophyll-*a* TSI = 9.81 ln (*Chl-a ug/l*) + 30.6
- Total phosphorus TSI = 14.42 ln (*TP ug/l*) + 4.15

The linear regressions for Carlson's TSI were calculated using data collected from thousands of lakes in and outside the U.S. The TSI represents absolute values that can be applied to most lakes to characterize their trophic status and general condition. A TSI value was calculated for each of the three variables collected from Tycoon Lake in 2016 (*Table 7*). Per Carlson's (1977) recommendation, average summer (July, August, September) chlorophyll-*a* and spring (April, May, June) total phosphorus TSI values were used to determine the final TSI value. Transparency based (Secchi depth) TSI values were calculated but Carlson warns against using transparency as a variable in waters with high non-algal turbidity, namely, sediment and silt (Carlson, 1980). Such is the case with many lakes and more specifically, reservoirs in Ohio.

Table 7 — Trophic state classification, TSI data and trends in trophic state for Tycoon Lake data from 2016.

Site	Date	Chl. *a* (µg/L)	TSI Chl-*a*	SD (m) Raw Data	TSI SD	TP (µg/L)	TSI TP	Final TSI	Trophic Classification
Tycoon Lake L1	6/29/2016	8.5	**52**	1.325	**56**	15.2	**43**	**56**	Eutrophic
Tycoon Lake L1	7/19/2016	34.4	**63**	1.06	**59**	23	**49**		
Tycoon Lake L1	8/10/2016	64.4	**71**	0.895	**62**	28.2	**52**		
Tycoon Lake L1	9/6/2016	89.2	**75**	0.73	**65**	25	**51**		
Tycoon Lake L1	9/29/2016	24.8	**62**	0.85	**62**	24	**50**		

Since Ohio does not have a very robust baseline of lake data, the use of TSI as a general tool for trend assessment is appropriate. Based on data collected in 2016, the final TSI for Tycoon Lake was calculated to be 56, which is slightly lower than the 1990 TSI value of 58. Although there appears to be a slight decrease in water quality based on trophic state analysis, both studies indicate the lake is productive and reflects a eutrophic status. While nutrient availability in sediment and biomass is not considered, the TSI value shows there are enough nutrients (TP) present in the water column to cause this lake to be considered nutrient enriched, since the TSI-TP values are almost all above the eutrophic/nutrient-enriched threshold of 48.

Conclusions

Tycoon Lake, constructed in 1960 is a medium size reservoir fed by two very small drainage areas. The residence time is 3.3 years at baseflow indicating the water entering the lake remains in the lake a long time. The turnover rate in Tycoon Lake is 30% which means that 30% the lake's volume is replaced each year. The challenges that exist in Tycoon Lake are symptomatic of a watershed impacted by nutrient loading exacerbated by the long residence time. Tycoon Lake had an elevated median concentration of chlorophyll-*a* during the sampling period. Chlorophyll-*a* increased as the summer progressed, while transparency decreased. The results of these two parameters suggested that algal production was amplified later in the summer.

TN and TP levels were also elevated, suggesting that nutrient loading from outside sources may be a significant factor in this watershed. Since 31.5 percent of the relatively small watershed is impacted by agriculture, these outside sources of nutrients likely included agricultural run-off, cattle with unrestricted access to streams, and/or sewage discharges from unsewered areas. Additionally, bottom phosphorus levels were elevated, which was an indication of internal loading. In a hypoxic environment, this source of internal nutrient loading initiates and promotes algal bloom activity.

Fortunately, bacteria levels in Tycoon Lake were very low, thus limiting the risk of acquiring pathogen-related diseases that can result from skin contact with the water. Analyses of sediment and water column samples indicated that the lake is free of heavy metal contamination. Finally, although algal bloom production was noted with cyanobacteria dominating the biomass, cyanotoxin test results did not reveal any toxins above the current advisory thresholds for recreation.

Tycoon Lake met aquatic life use based on the 2016 chemical data as compared to the EWH criteria. Attainment of the recreation use was met as well. The Public Drinking Water Supply Use does not pertain to Tycoon Lake since Tycoon Lake is not a public water supply. Federal, state and local stakeholders can utilize the information summarized in this report to help develop an appropriate lake or watershed management plan with a goal of decreasing internal and external nutrient load, and ultimately slowing the rate of eutrophication in Tycoon Lake.

References

Carlson, R. E. (1977, March). A trophic state index for lakes. *Limnology and Oceanography, 22*(2), 361-369.

Carlson, R. E. (1980, March). More complications in the chlorophyll-Secchi disk relationship. *Limnology and Oceanography, 25*(2), 379-382.

Carlson, R.E. 1983. Discussion on "Using differences among Carlson's trophic state index values in regional water quality assessment," by Richard A. Osgood. Water Resources Bulletin. 19:307-309.

Cooke, G. D. (2005). *Restoration and Management of Lakes and Reservoirs* (Third ed.). New York, NY: CRC Press.

D'Anglada, L. (2016, October 25). *Cyanobacteria/Cyanotoxins*. Retrieved from USEPA - Nutrient Policy and Data: ***https://www.epa.gov/nutrient-policy-data/cyanobacteriacyanotoxins***

MacDonald, D. D., Ingersoll, C. G., & Berger, T. A. (2000, January 13). Development and Evaluation of Consensus-Based Sediment Quality Guidelines. *Archvies of Environmental Contamination and Toxicology, 39*, 20-31.

Ohio Department of Natural Resources. (2018). *Tycoon Lake Dam: Vital Statistics*. (D. o. Engineering, Producer) Retrieved from Dam Risk Reduction Program: ***http://engineering.ohiodnr.gov/dam-risk-reduction-program/current-projects/cutler-lake-dam#stat***

Ohio EPA. (1996). *Ohio Water Resource Inventory Volume 3: Ohio's Public Lakes, Ponds, & Reservoirs.* Retrieved from ***http://www.epa.state.oh.us/portals/35/documents/96vol3.pdf***

Ohio EPA. (2008, April). *Ohio Specific Sediment Reference Values.* Retrieved from Ohio EPA Division of Environmental Response and Revitalization Ecological Risk Assessment Guidance Document: ***http://www.epa.ohio.gov/portals/30/rules/rr-031.pdf***

Ohio EPA. (2015, July 31). *Surface Water Field Sampling Manual for Water Quality Parameters and Flows*. Retrieved from ***http://epa.ohio.gov/Portals/35/documents/SW%20Sampling%20Manual%202015%20Update%20Final%20Main.pdf***

Persuad, D., Jaagumagi, R., & Hayton, A. (1993, August). *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario.* Retrieved from Ontario Ministry of Environment and Energy: ***https://www.itrcweb.org/contseds-bioavailability/References/guide_aquatic_sed93.pdf***

Reckhow, K. H., & Chapra, S. C. (1983). *Engineering Approaches for Lake Management* (Vol. 1: Data analysis and empirical modeling). Boston, MA: Butterworth Publishers.

Rice, E., Baird, R., & Eaton, A. (2017). *Standard Methods for the Examination of Water and Wastewater* (23 ed.). American Public Health Association; American Water Works Association; Water Environment Federation.State of Ohio. (2016). *State of Ohio Harmful Algal Bloom Response Strategy for Recreational Waters.* Retrieved from ***http://epa.ohio.gov/portals/35/hab/HABResponseStrategy.pdf***

Wetzel, R. G. (2001). *Limnology: Lake and River Systems* (Third ed.). San Diego, CA: Academic Press.

Lake Rupert, 2016

Inland Lake Water Quality Report

Lake Rupert 2018

Division of Surface Water
Inland Lakes Program
2019

Lake Rupert

Inland Lake Water Quality Report

2019

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Introduction: Inland Lakes Monitoring

Ohio EPA has implemented a sampling strategy that focuses on evaluating chemical conditions near the surface and physical conditions in the water column of inland lakes. Physical profile measurements are summarized either for the entire water column or the epilimnion depending on the existence of thermal stratification. The sampling target consists of an even distribution of 10 sampling events divided over a two-year period and collected during the recreation season of May 1 through October 31.

Key parameters analyzed in lakes include chlorophyll-*a*, ammonia, D.O., pH, total dissolved solids along with various metals for multiple beneficial use assessments. Other parameters used to evaluate lakes include Secchi depth, total phosphorus and total nitrogen. Details of the sampling protocol used at the time of this sampling are outlined in the ***2016 Inland Lakes Sampling Procedures Manual***. Sampling objectives for inland lake surveys are defined in Ohio EPA's Inland Lakes Sampling QAPP, and the rules relative to inland lakes beneficial uses are described in the 2010 and successive Water Quality Monitoring Integrated Reports.

Figure 1 — Location of Lake Rupert in southeastern Ohio.

Study Lake: Lake Rupert

This lake report will describe the physical characteristics of Lake Rupert and the watershed that feeds it. It will then discuss the physical, chemical and biological aspects that existed during the 2016-17 sampling effort. These sampling results are then applied to relevant beneficial uses, and a trend assessment is provided comparing 2016-17 results to data collected from Lake Rupert during 1982. Finally, lake management implications are discussed for potential water quality improvement strategies.

Lake Rupert is located within the 1,298-acre Wellston Wildlife Area, four miles north of the city of Wellston (Figure 1). Lake Rupert was built in 1969 as a cooperative effort of the Ohio Department of Natural Resources (ODNR) and the city of Wellston to provide a drinking water supply for the city and a recreational source for the general public. In 1979, the ODNR Division of Wildlife received ownership of the area from the city. The topography includes gently rolling, reverting old fields and woodland.

An in-stream impoundment fed by Little Raccoon Creek to Raccoon Creek, Lake Rupert lies within the Little Raccoon Creek-Meadow Run watershed (hydrologic unit 05090101-04-01) and is within the Western Allegheny Plateau (WAP) ecoregion. The lake encompasses 327 acres at normal pool with a shoreline length of nine miles. The maximum depth is 24 feet. Lake Rupert (22.2 sq. mi. drainage area) has three major inlet tributaries; Little Raccoon Creek (12.5 sq. mi.), McConnel Run (4.5 sq. mi.) and the west UNT (2.5 sq. mi.). The lake was built in a pre-Illinoian glacier stream channel by placing a 1510-foot dam (1510 feet) on Little Raccoon Creek.

Table 1 — Lake Rupert Key Attributes

Lake Type:	**Dam/Permanent Impoundment[1]**
Ecoregion:	Western Allegheny Plateau (WAP)
Surface Area:	327 acres[1]
Length of Dam:	1510 feet[2]
Storage Capacity:	731.5* million gallons[2] (97.8 million ft3)
Shoreline:	9 miles[1]
Watershed:	22.25 square miles[2]
Maximum Depth:	7.4 meters (24 ft.)[1]

*at Principal Spillway Elevation
[1] ODNR Division of Wildlife
[2] ODNR Division of Water Resources – Dam Safety Program

Physical Attributes

The L1 sampling location is centered at GPS location 39.1775 latitude -82.5203 longitude, 360 feet from the lake standpipe at river mile (RM) 33.3 (Figure 2). The "L1" naming convention indicates a primary sampling location that is deemed representative of the whole lake and is the location used to determine attainment status of applicable beneficial uses. Other locations (e.g. L2, L3 etc.) may be determined necessary to support attainment decisions on larger lakes and reservoirs. Lake Rupert was constructed in 1969. Lake Rupert is a no-wake lake but has no limit on engine horsepower. The lake does not have a beach. It is a popular fishing destination for nearby residents, as well as tourists. In fifteen visits to the lake for sampling, only one time was there no one observed fishing at the lake. There is a concrete public boat ramp located on the east side of the lake and five shoreline parking areas for bank fishing.

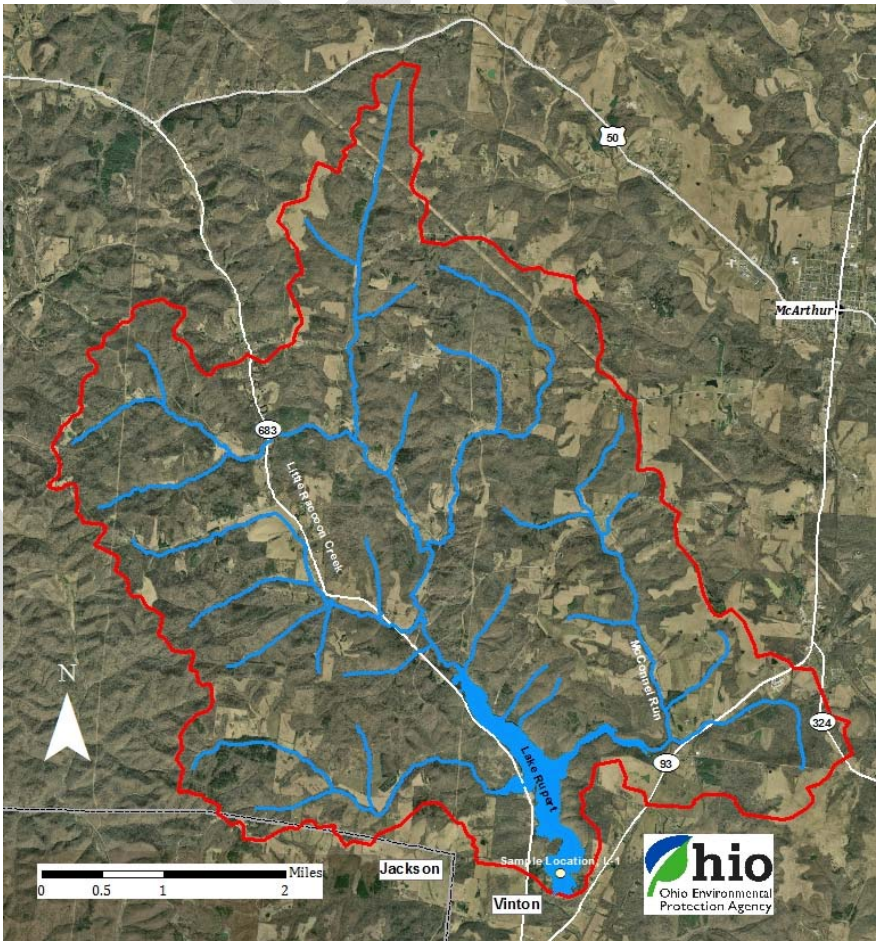

Figure 2: Aerial imagery of Lake Rupert with location L1 shown. Sources, ESRI, Digital Globe, Geo Eye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN, and the GIS User Community.

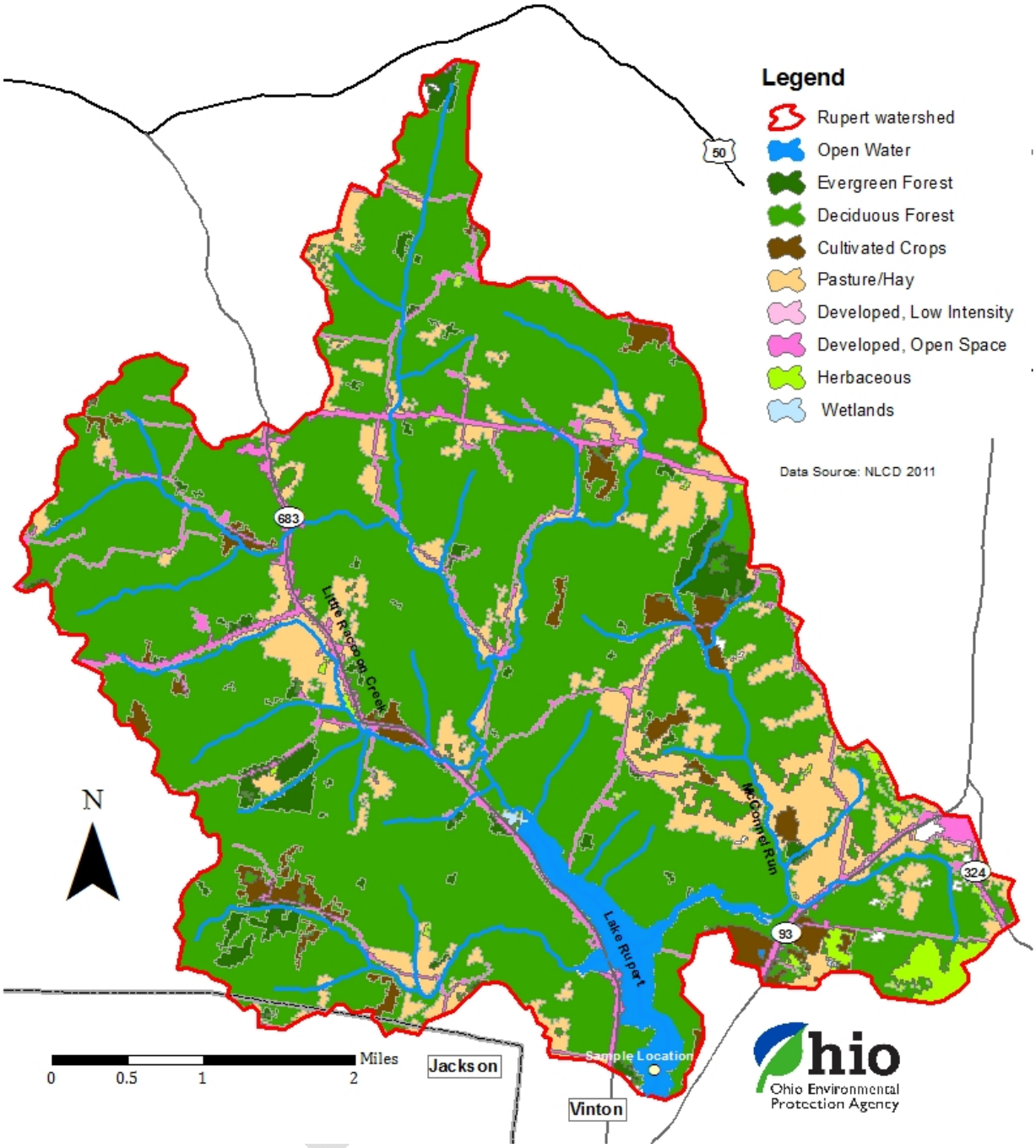

Figure 3 — Land cover in the watershed draining to Lake Rupert.

Watershed Overview

The Lake Rupert dam is an impoundment of Little Raccoon Creek and is also fed by McConnel Run. Little Raccoon Creek and McConnel Run are designated warmwater habitat (WWH) streams. Lake Rupert drains about 22.25 square miles of which 2.06 square miles are composed of Wellston Wildlife Area and Richland State Forest. The watershed has a maximum elevation of 1040 feet on the western edge and an outlet elevation of 680 feet. The lake is surrounded by forested areas with agricultural activities in the upper

watershed (NLCD 2006). Land use in the watershed is dominated by forest (75.7%), cultivation and pasture (14.3%), with 5.45% development (Figure 3). The developed areas are typically large homestead lots.

Geological characteristics associated with the Lake Rupert area are made up of Pennsylvanian-aged Allegheny Pottsville Group - shale, siltstone, and underclay. The pre-Illinoian glacier drainage system beneath Lake Rupert is comprised of loess and silty colluvium or old alluvium in the underground valley.

Results Discussion

Water Column Chemistry

A physical profile of the water column was evaluated during each sampling event (2016-17) at the L1 sampling location at Lake Rupert. Readings were recorded at the surface (which is defined as a 0.5-meter depth), at 0.5-meter intervals thereafter, with a final measurement collected 0.5 meters above the bottom of the lake.

Physical conditions changed little throughout the sampling season. Stratification occurred early in the sampling season and ended in late summer when complete mixing of the lake occurred. Thermal stratification occurs in deep lakes during the warm summer months, consisting of an upper mixed zone (epilimnion), a slightly denser middle zone (metalimnion), and a lower zone (hypolimnion) where mixing is impeded by a density barrier caused by lower water temperatures near the bottom of a lake. A sharp decrease in temperature and dissolved oxygen is often noted where the hypolimnion forms. However, in the case of Lake Rupert, water temperature and dissolved oxygen decreased steadily through the water column, with a somewhat sharper drop-off near the bottom of the lake, indicating the presence of a small, abbreviated hypolimnion (Figure 4).

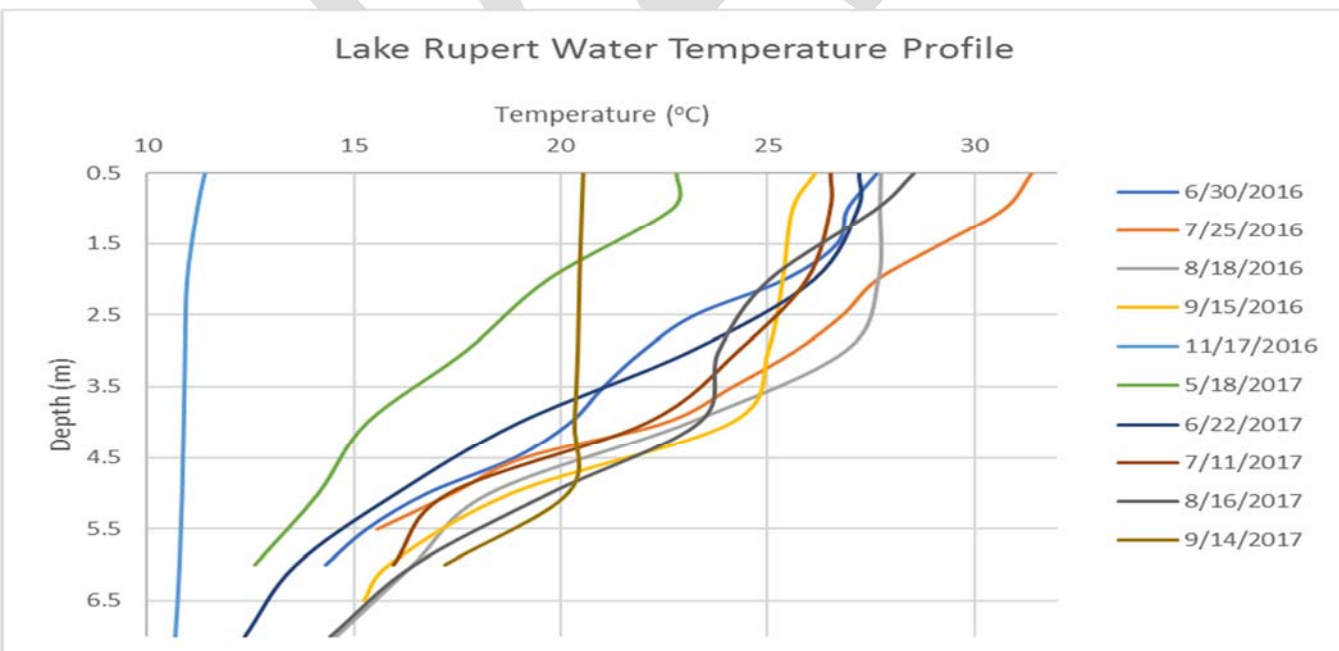

Figure 4. Temperature profiles recorded during 2016 and 2017.

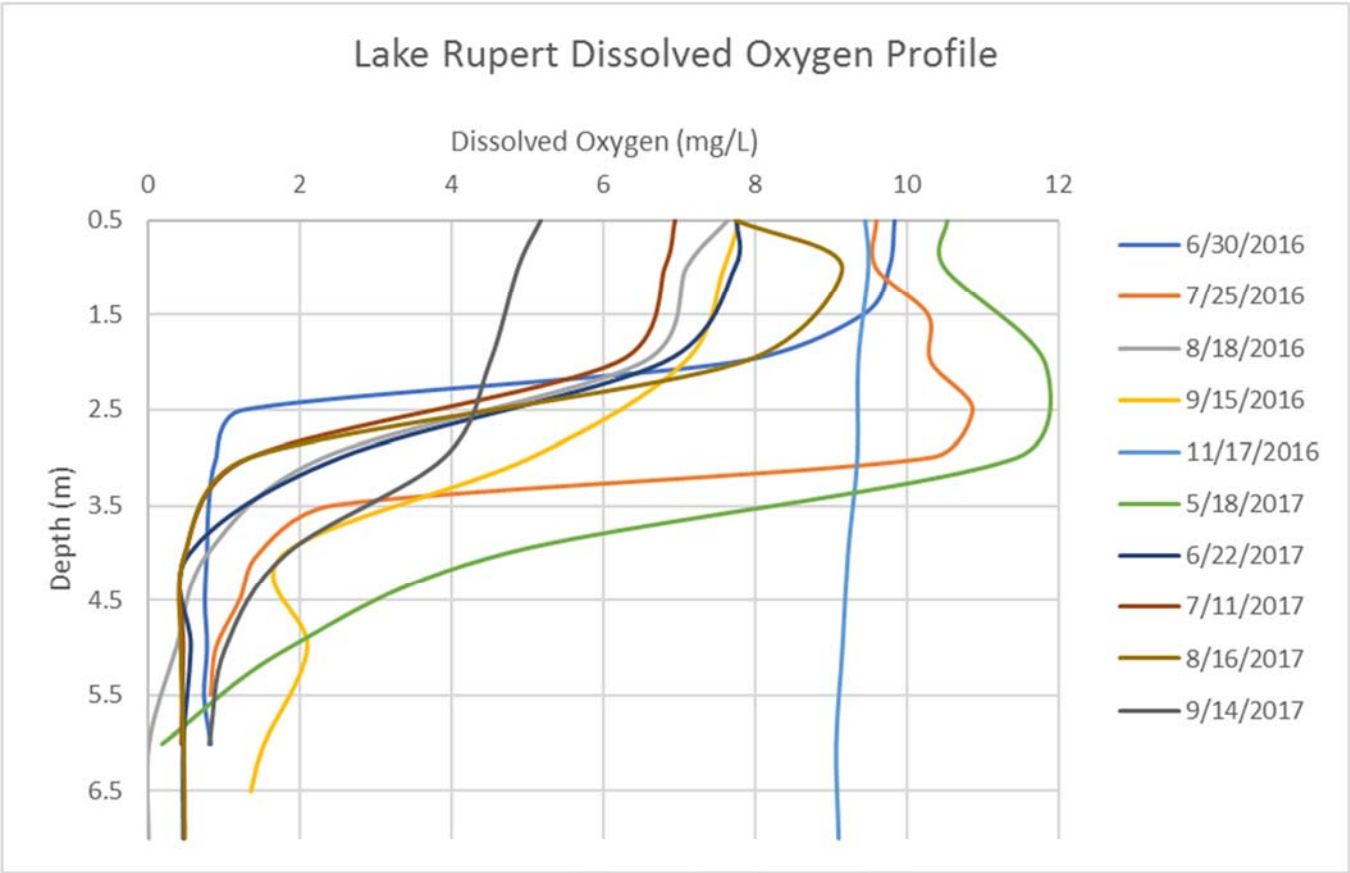

Figure 5. Dissolved oxygen profiles recorded during 2016 and 2017.

Metals, nutrient and other physical parameters such as dissolved oxygen, pH, turbidity, and alkalinity were collected and analyzed from the surface at L1. The results were compared to the statewide EWH criteria and aquatic life use benchmarks. No exceedances were recorded for metals during this sampling effort.

The hypolimnion of productive lakes can become depleted of oxygen (hypoxic) if consumption by decomposing organic matter exceeds reaeration by atmospheric diffusion and photosynthesis. Dissolved oxygen levels in the metalimnion and epilimnion can swing significantly over a 24-hour period under such conditions. Fish access to habitat, cool water and benthic prey can be limited if any part of the water column becomes hypoxic. An oxygen deficit, defined for the purposes of this report as a concentration of 4 mg/L or less, was documented during all but one sampling event at L1. The zone of oxygen deficit extended from the bottom of the lake to 2.5-meters in depth. Under these conditions, organically bound phosphate in lake sediments decomposes and is converted to orthophosphate (the biologically available form of phosphate), that is available for biological uptake. Because orthophosphate is a reactive form of phosphorus, its concentration is often a good indication of the amount of phosphorus that is readily available for plant and algae growth. The surface orthophosphate averaged 3.33 ug/L over the two-year sampling period while the bottom orthophosphate sample averaged 5.11 ug/L for the sample period.

Lake Rupert transparency at L1 averaged 1.57 meters over the sampling period (median 1.55 m). Low Secchi readings in Lake Rupert were likely caused by algal growth and suspended solids in this productive lake environment. Profile data indicated dissolved oxygen trending downward as summer progressed, likely related to increasing water temperatures and the extensive growth of hydrilla. Dissolved oxygen

levels in the epilimnion did fall below the EWH inland lakes minimum criterion of 5.0 mg/L and the bottom DO concentrations and median D.O. concentrations through the entire water column were consistently low during most of the summer. The dissolved oxygen criterion of 5.0 mg/l applies in the epilimnion of stratified lakes, and throughout the water column in unstratified lakes.

Table 2 — Dissolved oxygen concentration in Lake Rupert during 2016 and 2017.

Dissolved Oxygen Concentrations, Lake Rupert L1 2016 and 2017			
Parameter (mg/L)	D.O. (mg/L) - Surface	D.O. (mg/L) - Bottom	Mean D.O. (mg/L) – Whole Water Column
Aquatic Life Criterion	**≥5.0[1]**		
6/30/2016	9.85	0.82	0.855
7/25/2016	9.61	0.83	9.6
8/18/2016	7.65	0.01	1.55
9/15/2016	7.81	1.34	3.565
11/17/2016	9.45	9.11	9.29
5/18/2017	10.54	0.17	10.5
6/22/2017	7.76	0.47	1.55
7/11/2017	6.94	0.43	1.32
8/16/2017	7.74	0.48	0.91
9/14/2017	5.17	0.81	3.89

The amount of phosphorus in a lake is important because it is commonly the growth limiting nutrient. Sources of phosphorus to a lake can be external (i.e. tributary loading or precipitation) and internal (i.e. biota, sediment or groundwater). Only a small portion of organic phosphorus is available for biological uptake, but in dissolved ionic form (orthophosphate) it passes easily through membranes and is readily available. Decomposition of dead plants and animals releases inorganic phosphorus into the water column. Phosphorus bound to particulate matter in the sediment can also be released to the water column under anoxic conditions if the bond is redox sensitive (i.e. iron or calcium).

Figure 6. Hydrilla along Lake Rupert shoreline.

Hydrilla can reduce recreation use of lakes by interfering with boating and reducing fish and other aquatic organisms (OSU 2018). The massive hydrilla mats prevent sunlight from reaching other aquatic plants and as the mats die, the decomposition process depletes oxygen. Aquatic plants use oxygen during the night and give off carbon dioxide, an end product of respiration. Since the hydrilla reaches the surface in many areas of the lake, it can impede boating. As Hydrilla dies, the bacteria depletion of oxygen from the water drives fish out of these areas (Gabriel et. Al 2018). The dense hydrilla

[1] The dissolved oxygen criteria apply in the epilimnion of stratified lakes and throughout the water column in unstratified lakes.

mats increase water temperatures and cause dramatic swings in dissolved oxygen and pH (figure 7.). In 2016, pH swings in the upper 3.5 meters of the water column fell below WQS of 6.5 S.U. These decreases in pH and D.O. can contribute to an increased release of nutrients from sediment into the water column.

Nutrient parameters were analyzed to help understand trophic dynamics in Lake Rupert. Internal loading of phosphorus was determined to be a potential factor in this system. Total phosphorus concentration at the surface based on the 10 sampling events averaged 30.2 µg/l while bottom mean concentration was 32.1 µg/l. Daytime dissolved orthophosphate at the surface was 3.33 µg/l and bottom average was 5.11 µg/l.

The presence of nutrients, especially phosphorus, can stimulate the growth of algal blooms. This process may be exacerbated during autumn when thermal stratification degrades, and the lake experiences the complete mixing associated with fall turnover. Total nitrogen (TN) is the sum of total Kjeldahl nitrogen (TKN) and nitrate/nitrite and can be an important factor in systems that are nitrogen limited. TN values were more reflective of a mesotrophic (medium productivity) or even oligotrophic (low production) system in June, July and August and then increased to 710 µg/l measurement in mid-September, 2017 (Figure 7). This result is more indicative of a eutrophic to hyper-eutrophic (highly productive) system that often experience seasonal shifts in phytoplankton structure (Wetzel, 2001).

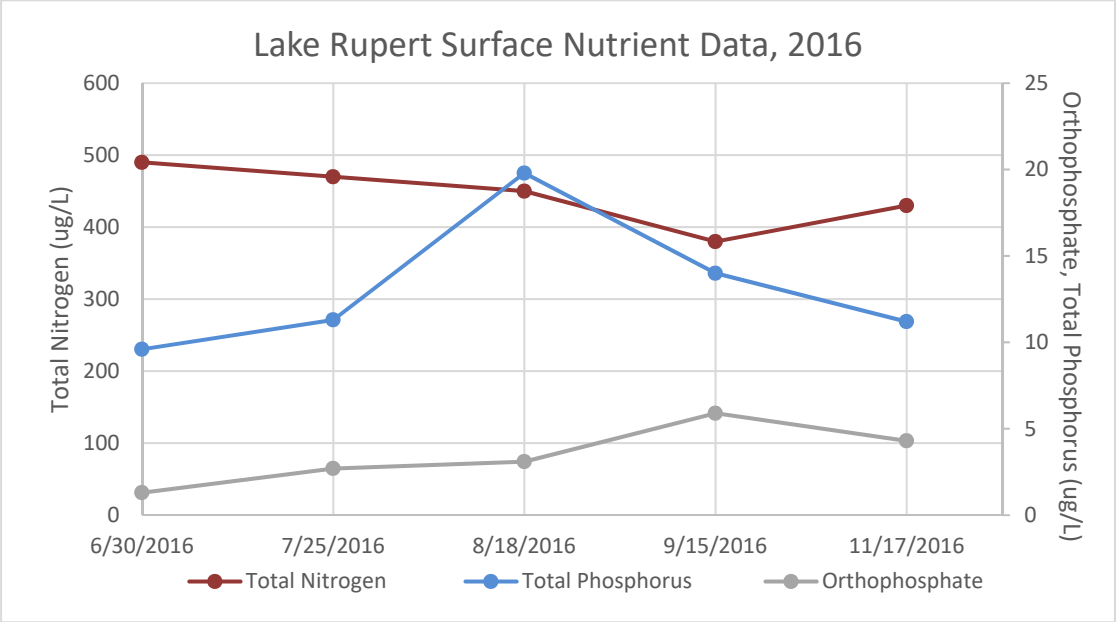

Figure 7. Lake Rupert surface nutrient data for 2016.

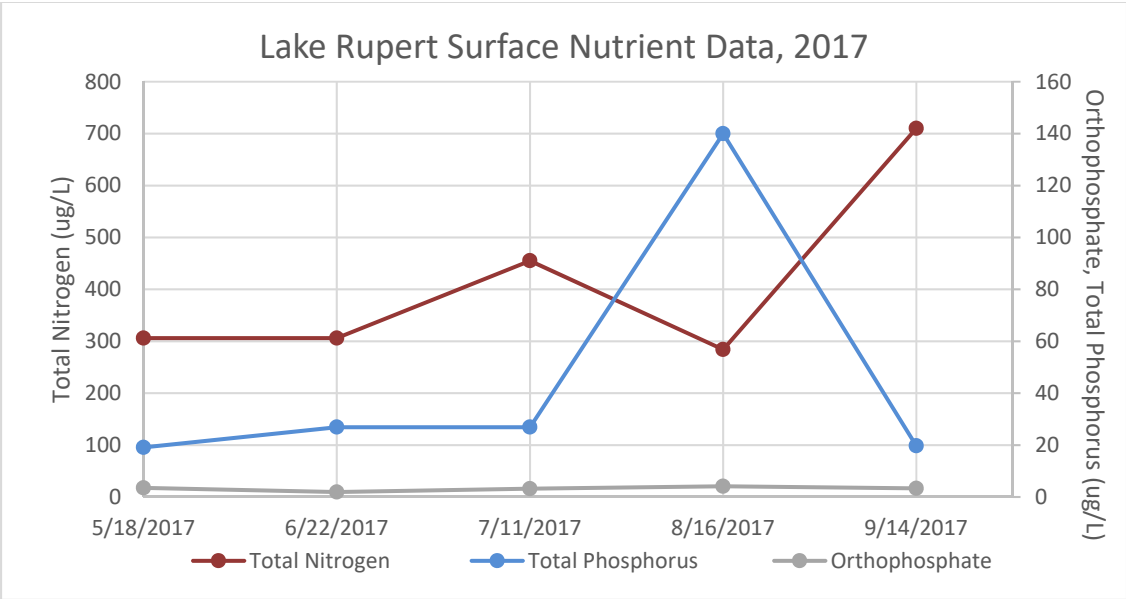

Figure 8. Lake Rupert surface nutrient data for 2017.

Figure 9 — Use of a Petite Ponar dredge for lake sediment sample collection.

Sediment Chemistry

A sediment grab sample was collected using a Petite Ponar dredge during July 2016 at L1 and was analyzed for metals, nutrients, volatile organic compounds, PCBs and pesticides (organo-chlorine insecticides) (Figure 9) (Table 3).

Sediment data were evaluated using *Ohio Sediment Reference Values (SRVs)* (Ohio EPA, 2008)along with guidelines established in *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems* (MacDonald, Ingersoll, & Berger, 2000). Ohio EPA SRVs represent ecoregion background conditions for metals based on data collected at Ohio reference sites. These values were developed for lotic (flowing) water bodies and are based on Ohio ecoregions. Sediment concentrations for lentic (non-flowing) surface water bodies can be screened using these values. MacDonald guidelines define two levels of ecotoxic effects. A threshold effect concentration (TEC) is a level of sediment chemical quality below which harmful effects are unlikely to be observed and can be considered comparable to background conditions. A probable effect concentration (PEC) indicates a level above which harmful effects are likely to be observed. These guidelines include both metals and organic parameters.

Finally, guidelines established by the Ontario Ministry of the Environment (Persuad, Jaagumagi, & Hayton, 1993) were used to evaluate sediment sample results for total organic carbon (TOC) and total phosphorus (TP). These guidelines include the lowest effect level (LEL) and the severe effect level (SEL). The LEL is a level of sediment concentration that can be tolerated by a majority of benthic organisms. The SEL is a concentration considered harmful to most benthic organisms.

Organic compounds were undetected in the sediment sample collected at L1, and, thus, are not reported in Table 3. Concentrations of metals were below the TEC, SEL and Ohio SRVs for the Western Allegheny

Plateau ecoregion. Arsenic, cadmium, nickel and phosphorus exceeded the LEL, but were still below the SEL. Thus, the sediment sample collected at L1 did not contain metals in concentrations exceeding the paired, more protective reference value (the PEC or the SEL) (Table 3).

The sample result of 2.1 percent for TOC did not exceed the LEL of 2.5 percent. Additionally, the sediment sample result of 952 mg/kg TP exceeded the LEL of 600 mg/kg. This indicates a baseline concentration of phosphorus is present in the lake's sediment, further reinforcing that internal loading of phosphorus may be occurring and contributing to aquatic vegetation and algal bloom growth. Ohio EPA does not currently utilize a reference guideline for ammonia concentrations in sediment similar to the Ontario research-based thresholds for phosphorous or total organic carbon. The sediment concentration of ammonia at L1 was 65 mg/kg. The Lake Rupert ammonia sediment result is the lowest ammonia sediment for when compared to thirty sediment samples collected in the WAP since 2008.

Table 3 — Chemical parameters measured above screening levels in samples collected by Ohio EPA from bottom sediments in Lake Rupert, July 2016.

Parameter	L1 Concentration
TOC (%)	2.1
Arsenic (mg/kg)	**7.16**
Cadmium (mg/kg)	**0.382**
Chromium (mg/kg)	16.1
Copper (mg/kg)	13.6
Lead (mg/kg)	20.6
Nickel (mg/kg)	**16.4** B
Selenium (mg/kg)	<2.06
Aluminum (mg/kg)	14,100
Barium (mg/kg)	162
Calcium (mg/kg)	<2060
Iron (mg/kg)	19,400
Magnesium (mg/kg)	1680
Manganese (mg/kg)	335
Potassium (mg/kg)	<2060
Sodium (mg/kg)	<5160
Strontium (mg/kg)	<31
Zinc (mg/kg)	66.9
Mercury (mg/kg)	0.085
Ammonia (mg/kg)	65
T-Phosphorus (mg/kg)	**952**

B - Method blank contamination. The associated method blank contains the target analyte at a reportable level.
< - not detected at or above the method reporting limit.
Contamination levels were determined for parameters using Ohio Sediment Reference Values (SRVs), consensus-based sediment quality guidelines (MacDonald, et.al. 2000) and guidelines from the Ontario Ministry of the Environment (Persuad et. al. 1993). Bold numbers indicate values above the Lowest Effect Level (LEL). Red values are above the SRV.

Phytoplankton Results

The phytoplankton community in Lake Rupert was characterized based on water samples collected using an integrated tube sampler deployed to either a maximum of two meters (m) or twice the Secchi depth if less than one meter. Samples were collected at L1 during two of the five sampling events in 2016 (June and September) and during all five sampling events in 2017. Samples were preserved with Lugol's solution and submitted to BSA Environmental Services, Inc. for analysis. The phytoplankton present in a representative

aliquot were identified to at least genus level (usually species) in accordance with *Standard Methods for the Examination of Water and Wastewater* Method No. 10200 (American Public Health Association 2012). Cell densities (cells/L) and bio-volumes ($\mu m^3/L$) were then estimated. Phytoplankton communities exhibit a seasonal succession when factors like water temperature, nutrients, transparency and photoperiod favor certain types. Grazing by larval fish and zooplankton also affects community composition. Temperate lakes in Ohio are usually dominated by diatoms (Bacillariophyta) in the spring until micronutrients like silica are depleted, then by blue green algae (cyanobacteria) in the fall, when an ability to control buoyancy and fix nitrogen from the atmosphere gives certain types a competitive edge.

The phytoplankton population at Lake Rupert L1 contained five to nine different classes of algae in all samples. Cyanobacteria represented less than 2.0 percent of the total biovolume of phytoplankton during the early summer with golden-brown algae (Chrysophyta) making up 59.3 and 63.9 percent, respectively, during 2017. When breaking down the results by sampling event, the total biovolume of cyanobacteria increased sharply throughout the summer. The July, August and September phytoplankton samples were comprised of 94.4, 89.3 and 87.4 percent cyanobacteria respectively in 2017.

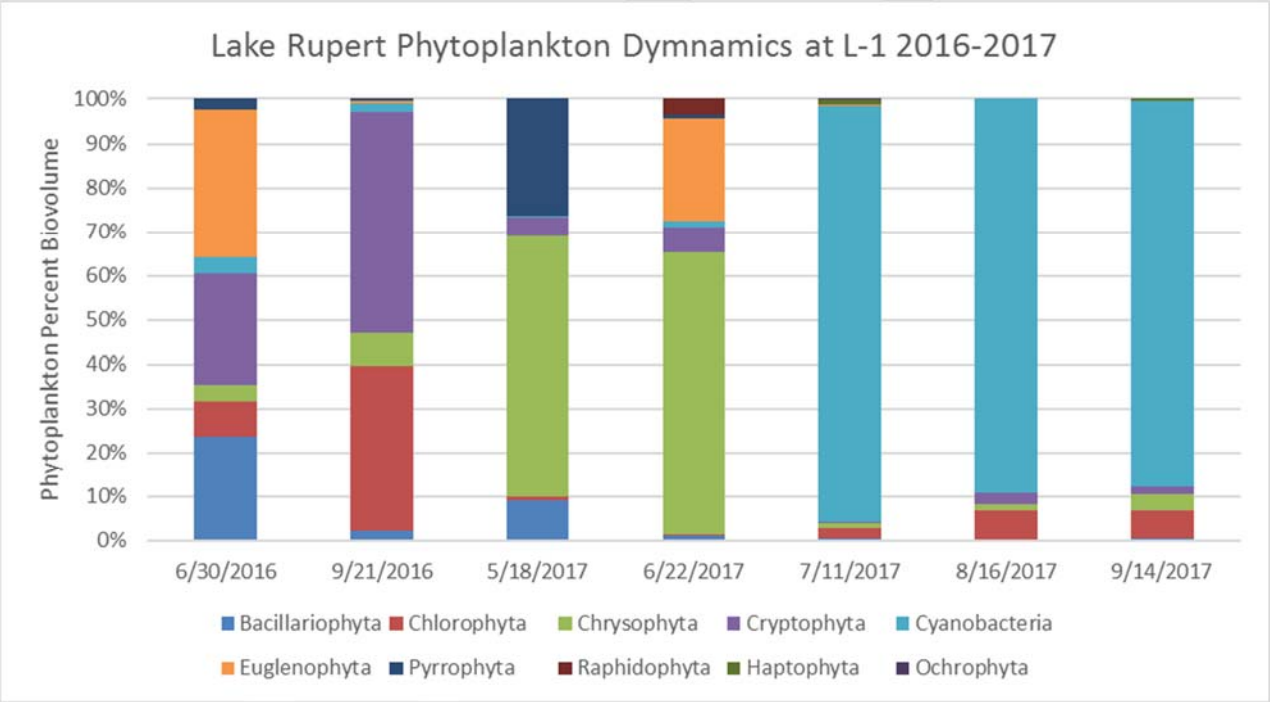

Figure 10 — Phytoplankton dynamics at Lake Rupert during 2016.

A community dominated by cyanobacteria is of concern when toxin-producing phytoplankton are present. Discussion of cyanotoxin sampling results is contained below in the Recreation Use Assessment section. Genera of phytoplankton that can produce cyanotoxins identified within the samples collected at Lake Rupert included *Aphanizomenon, Aphanocapsa, Cylindrospermopsis*, *Dolichospermum* (fka: *Anabaena*), *Merismopedia tenuissima*, *Microcystis, Oscillatoria, Planktonlyngbya, Pseudanabaena, Synechococcus and Woronichinia* (D'Anglada, 2016). Seasonal phytoplankton succession in reservoirs can be quite complicated and highly variable. In late summer, 2016, the cyanobacteria biovolume was less than 2 percent. This variability can even exist longitudinally, with completely different communities dominating the upper, middle and lower sections of larger reservoirs (Wetzel, 2001). However, the existence of toxin producing cyanobacteria along with a major shift toward cyanobacteria dominance are symptomatic of a eutrophic

(nutrient enriched) system. A breakdown of the seasonal phytoplankton composition is presented in Figure 10.

Beneficial Use Assessment

Public Drinking Water Use Assessment

Like all public lakes in Ohio (except Piedmont Reservoir), Lake Rupert is designated a public water supply (PWS) in the Ohio WQS. The lake does serve as a public drinking water supply (PDWS) source.

Recreation Use Assessment

Ohio conducts a monitoring and notification program of selected public and semi-private beaches to test the water quality and notify the public whenever bacteria and algal toxin levels present a potential health risk to those engaged in water activities. In support of this monitoring program, bacteria and algal toxin concentrations were examined to determine suitability for recreation use. *Escherichia coliform* (*E. coli*) bacteria were measured. This site was sampled five times in 2016.

"The geometric mean value for *E. coli* results was compared to the Primary Contact Recreation (PCR) criterion of 126 CFU/100 mL. Furthermore, each data point was also compared to the Statistical Threshold Vale (STV) of 410 CFU/100 mL using a minimum of 5 sampling results in a 90 day period. The geometric mean of this data was 7.0 CFU/100 mL, well below the PCR, and none of the data points were above the STV. However, since only 4 samples were collected, there was insufficient data to verify Tycoon Lake attained the recreation use for PCR."

Standards for algal toxin concentrations are currently being developed, but the State of Ohio has established thresholds for recreational advisories. For public beaches, a recreational public health advisory is posted when a possible harmful algal bloom (HAB) is visually confirmed and/or when cyanotoxin levels are equal to or exceed recreational public health advisory thresholds, whether or not a HAB is still present. An elevated recreational public health advisory (no contact) is posted when cyanotoxin levels are equal to or exceed the elevated recreational public health advisory thresholds (State of Ohio, 2016).

Table 4 — 2016 E. coli results.

Parameter	E. coli (CFU/100 mL)
Primary Contact Recreation Criterion	**126**
7/18/2016	10 JL
7/26/2016	<10 U
8/11/2016	<10 U
8/16/2016	<10 U
8/17/2016	40 JL
Geomean	**13.2**

JL: The analyte was positively identified; the associated numerical value is estimated.
U: The reported value is less than the laboratory method detection limit

Lake Rupert is considered a recreation lake, so samples were collected and analyzed for microcystin, saxitoxin and cylindrospermopsin on all 10 sampling events at L1 during 2016 and 2017. The results for all toxin samples were below the current advisory thresholds for recreation water for all three toxins, indicating safe levels based upon these sampling events. Anatoxin was not analyzed during this survey (Table 5).

Table 5 — Summary of data used to determine the recommended advisory thresholds for cyanotoxins in recreational waters.

Parameter (µg/L)	Microcystins	Cylindrospermopsin	Saxitoxin
Proposed Criterion (Advisory)	**6**	**5**	**0.8**
Proposed Criterion (No Contact)	**20**	**20**	**3**
6/30/2016	<0.05 U+	0.5	<0.022 U+
7/25/2016	<0.05 U+	<0.3 J, U+	<0.022 U+
8/18/2016	<0.05 U+	0.33	<0.022 U+

9/15/2016	<0.05 U+	<0.3 U+	<0.022 U+
11/17/2016	<0.05 U+	<0.3 U+	<0.022 U+
5/18/2017	<0.05 U-	<0.3 U+	<0.022 U-
6/22/2017	<0.05 U-	<0.3 U+	<0.022 U-
7/11/2017	<0.05 U-	<0.3 U-	<0.022 U-
8/16/2017	<0.05 U-	<0.3 U+	<0.022 U-
9/14/2017	<0.05 U-	<0.3 U-	<0.022 U-
% Over Threshold	**0**	**0**	**0**
Narrative	**support**	**support**	**support**

J: The analyte was positively identified; the associated numerical value is estimated.
U+: The reported value is between the laboratory method detection limit and the reporting limit.
U-: The reported value is less than the laboratory method detection limit

Human Health - Fish Consumption

Ohio has been sampling streams annually for sport fish contamination since 1993. Fish are analyzed for contaminants that bioaccumulate in fish and that could pose a threat to human health if consumed in excessive amounts. Contaminants analyzed in Ohio sport fish include mercury, PCBs, DDT, mirex, hexachlorobenzene, lead, selenium and several other metals and pesticides. Other contaminants are sometimes analyzed if indicated by site-specific current or historic sources. Fish tissue samples were not collected during the Raccoon Creek survey for Lake Rupert.

In a separate sampling effort during 2008, three fish tissue samples were collected and analyzed for fish consumption advisory determination (PCB, pesticide and heavy metal contamination) as a part of the Raccoon Creek watershed study. No consumption advisories have been issued beyond the statewide advisory for mercury as a result of this sampling effort. Statewide fish consumption advisories can be found at ***epa.ohio.gov/dsw/fishadvisory/index.aspx***.

Aquatic Life Use Assessment

The aquatic life use (ALU) designation for all inland lakes in Ohio is exceptional warmwater habitat (EWH) except for upground reservoirs which are designated warmwater habitat (WWH). In order to evaluate the ALU in Lake Rupert, ammonia, dissolved oxygen, pH, total dissolved solids and various metals were analyzed. Statewide water quality criteria for these parameters are summarized in Table 35-1 of the Ohio water quality standards. Other important parameters for assessing lake condition in Lake Rupert included nutrient parameters (e.g. total phosphorus, total nitrogen) and biological response variables (e.g. chlorophyll-a).

Where criteria do not exist, a common approach to assessing relative lake condition is to compare lake water quality sampling data to a regionally and lake type derived percentile (e.g. 25th) of existing lake data. The lower 25th percentile generally represents minimally impacted conditions protective of designated uses. For Ohio EPA, inland lake aquatic life use benchmarks were calculated for total nitrogen (T-N), total phosphorus (T-P) and chlorophyll-a (Chl. a) based on the lower 25th percentile of lake median data and for secchi depth based on the upper 75th percentile of lake median data. All data used for benchmarks were collected by Ohio EPA from Ohio inland lakes between 1989 and 2006.

Lake samples were collected from near the surface of Lake Rupert five times each during the 2016 and 2017 recreation seasons. Statewide Outside Mixing Zone Average (OMZA) water quality criteria listed in tables 35-1 through 35 of section 3745-1-35 of the OAC (Water Quality Standards) were used for most

parameters to evaluate the existing EWH designated use for Lake Rupert. Dissolved Oxygen is compared against the statewide OMZ Minimum criteria. Sampling results determined that Lake Rupert had no exceedances of the EWH ALU criteria during the 2016-17 field season

Table 6 — Summary of important lake data.

Aquatic Life Use Benchmarks							
Parameter	Chl. a (µg/L)	Secchi (m)	TN (µg/L)	TP (µg/L)	D.O. (mg/L)	pH (SU)	NH3-N (mg/l)
ALU Benchmarks	**≤6.2 median**	**2.16 min**	**≤350 median**	**≤14 median**	**≥5.0**	**6.5>pH<9.0**	**(WQS)**
6/30/2016	5.7	1.27	490	9.6	7.61	7.86	<0.05
7/25/2016	7.2	1.8	470	11.3	9.07	7.69	<0.05
8/18/2016	22.4	1.38	450	19.8	5.9	6.9	<0.05
9/15/2016	14	1.59	380	14	5.86	6.76	<0.05
11/17/2016	19.1	1.51	430	11.2	9.28	7.54	<0.05
5/18/2017	5.16	1.96	306	19.1	8.48	7.4	0.059
6/22/2017	6.6	1.43	306	---	6.21	7.96	<0.05
7/11/2017	9.77	1.73	455	26.9	5.31	7.31	<0.05
8/16/2017	13.7	1.73	284	140	5.3	7.52	<0.05
9/14/2017	15.7	1.29	710	19.7	3.55	7.01	0.054
Median	**11.735**	**1.55**	**440**	**19.1**	**---**	**---**	**---**

Trend Assessment

Ohio EPA conducted a detailed assessment of chemical, physical and biological conditions of Raccoon Creek watershed and its tributaries during the summer of 2016 to determine if the streams within the watershed were attaining water quality goals. The survey revealed that Raccoon Creek possessed good water quality with few exceedances of Ohio WQS. Iron exceeded the WQS of 5,000 mg/l, possibly due to past mining. Ammonia was in exceedance of the WQS downstream stream of some of the waste water treatment plants. Dissolved oxygen was below the minimum WQS, mostly due to slow moving water. Specific conductivity and total dissolved solids exceeded the WQS due exclusively to past coal mining. There were some elevated bacteria counts were found throughout the watershed, likely due to sewage discharges from unsewered areas, inadequate manure management and unrestricted cattle access to streams. Three sites were assessed downstream from Lake Rupert, on Raccoon Creek located at RM 29.2, RM 22.0 and RM 10.2. All three site attained the EWH aquatic life use.

Lake Rupert was assessed in May and August 1978 and April and August 1990 as a part of a Section 314 Clean Lakes Assessment Grant. This data was summarized in the 1982 *305(b) Report* and eventually integrated into Volume 3 of the 1996 *Ohio Water Resource Inventory 305(b) Report*, which can be found at ***epa.ohio.gov/portals/35/documents/96vol3.pdf*** (Ohio EPA, 1996). The report describes trophic state index (TSI) as one of several metrics used to assess the condition of Ohio's public lakes. Carlson's TSI is a numerical representation of a lake's state of productivity along a scale of 0 to 100. Each major division (10, 20, 30, etc.) represents a doubling in algal biomass based on transparency, total phosphorus and chlorophyll-*a* measurements (Carlson, 1977). Unproductive, oligotrophic lakes score on the lower end of the scale, mesotrophic lakes are in the middle and eutrophic/hyper-eutrophic lakes occupy the upper end of the continuum. In 1981, Lake Rupert was determined to have a final TSI of 58.0, a eutrophic condition. It

is worth noting that the Ohio Water Resources Inventory 305(b) Report indicates lake are hyper-eutrophic if the TSI is greater than 66.

The Carlson TSI values were calculated in the same manner as in the 1990 *Ohio 305(b) Lakes Report*, using formulas from Reckhow and Chapra (Reckhow & Chapra, 1983) as follows:

- Secchi disk TSI = 60 - 14.41 ln (*SD meters*)
- Chlorophyll-*a* TSI = 9.81 ln (*Chl-a ug/l*) + 30.6
- Total phosphorus TSI = 14.42 ln (*TP ug/l*) + 4.15

The linear regressions for Carlson's TSI were calculated using data collected from thousands of lakes in and outside the U.S. The TSI represents absolute values that can be applied to most lakes to characterize their trophic status and general condition. A TSI value was calculated for each of the three variables collected from Lake Rupert in 2016 (*Table **7***). Per Carlson's (1977) recommendation, average summer (July, August, September) chlorophyll-*a* and spring (April, May, June) total phosphorus TSI values were used to determine the final TSI value. Transparency based (Secchi depth) TSI values were calculated but Carlson warns against using transparency as a variable in waters with high non-algal turbidity, namely, sediment and silt (Carlson, 1980). Such is the case with many lakes and more specifically, reservoirs in Ohio.

Table 7 — Trophic state classification, TSI data and trends in trophic state for Lake Rupert data from 2016.

Site	Date	Chl. *a* (µg/L)	TSI Chl-*a*	SD (m) Raw Data	TSI SD	TP (µg/L)	TSI TP	Final TSI	Trophic Classification
Lake RupertL1	6/29/2016	8.5	**52**	1.325	**56**	15.2	**43**	**65**	Eutrophic
Lake RupertL1	7/19/2016	34.4	**63**	1.06	**59**	23	**49**		
Lake RupertL1	8/10/2016	64.4	**71**	0.895	**62**	28.2	**52**		
Lake RupertL1	9/6/2016	89.2	**75**	0.73	**65**	25	**51**		
Lake RupertL1	9/29/2016	24.8	**62**	0.85	**62**	24	**50**		

Since Ohio does not have a very robust baseline of lake data, the use of TSI as a general tool for trend assessment is appropriate. Based on data collected in 2016, the final TSI for Lake Rupert was calculated to be 65, which is slightly below the hyper-eutrophic score. Although there appears to be a slight decrease in water quality based on trophic state analysis, both studies indicate the lake is productive and reflects a eutrophic status. While nutrient availability in sediment and biomass is not considered, the TSI value shows there are enough nutrients (TP) present in the water column to cause this lake to be considered nutrient enriched, since the TSI-TP values are almost all above the eutrophic/nutrient-enriched threshold of 48.

Conclusions

Lake Rupert was constructed in 1960 and is a medium size reservoir fed by two very small drainage areas. The residence time is 3.3 years at baseflow indicating the water entering the lake remains in the lake a long time. The turnover rate in Lake Rupert is 30% which means that 30% the lake's volume is replaced each year. The challenges that exist in Lake Rupert are symptomatic of a watershed impacted by nutrient loading exacerbated by the long residence time. Lake Rupert had an elevated median concentration of chlorophyll-*a.* This concentration increased as the summer progressed, while transparency decreased. The results of these two parameters suggested that algal production was amplified later in the summer.

TN and TP levels were also elevated, suggesting that nutrient loading from outside sources may be a significant factor in this watershed. Since 31.5 percent of the relatively small watershed is impacted by agriculture, these outside sources of nutrients likely included agricultural run-off, cattle with unrestricted

access to streams, and/or sewage discharges from unsewered areas. Additionally, bottom phosphorus levels were elevated, which was an indication of internal loading. In a hypoxic environment, this source of internal nutrient loading initiates and promotes algal bloom activity.

Fortunately, bacteria levels in Lake Rupert were very low, thus limiting the risk of acquiring pathogen-related diseases that can result from skin contact with the water. Analyses of sediment and water column samples indicated that the lake is free of heavy metal contamination. Finally, although algal bloom production was noted with cyanobacteria dominating the biomass, cyanotoxin test results did not reveal any toxins above the current advisory thresholds for recreation.

Lake Rupert met standards for aquatic life use based on the 2016-17 chemical data as compared to the EWH criteria. Sport fish consumption should follow the statewide Ohio Sport Fish Consumption Advisory at ***https://www.epa.state.oh.us/dsw/fishadvisory/index#145214734-statewide***. Lake Alma attained its recreation targets since the 5 bacteria samples collected in 2016 were well below the criteria. The Public Drinking Water Supply Use does not pertain to Lake Rupert since Lake Rupert was not used as source for public water supply. Federal, state and local stakeholders can utilize the information summarized in this report to help develop an appropriate lake or watershed management plan with a goal of decreasing internal and external nutrient load, and ultimately slowing the rate of eutrophication in Lake Rupert.

References

Carlson, R. E. (1977, March). A trophic state index for lakes. *Limnology and Oceanography, 22*(2), 361-369.

Carlson, R. E. (1980, March). More complications in the chlorophyll-Secchi disk relationship. *Limnology and Oceanography, 25*(2), 379-382.

Cooke, G. D. (2005). *Restoration and Management of Lakes and Reservoirs* (Third ed.). New York, NY: CRC Press.

D'Anglada, L. (2016, October 25). *Cyanobacteria/Cyanotoxins*. Retrieved from USEPA - Nutrient Policy and Data: ***https://www.epa.gov/nutrient-policy-data/cyanobacteriacyanotoxins***

Gabriel, Tony, Navarro, J., Braig, E., (2018). *Ohio Field Guide to Aquatic Invasive Species*, The Ohio State University, Ohio Sea Grant. 43.

MacDonald, D. D., Ingersoll, C. G., & Berger, T. A. (2000, January 13). Development and Evaluation of Consensus-Based Sediment Quality Guidelines. *Archvies of Environmental Contamination and Toxicology, 39*, 20-31.

Ohio Department of Natural Resources. *Lake RupertWildlife Area History & Purpose*. http://wildlife.ohiodnr.gov/tycoonlakewa#tabr2.

Ohio EPA. (1996). *Ohio Water Resource Inventory Volume 3: Ohio's Public Lakes, Ponds, & Reservoirs.* Retrieved from ***http://www.epa.state.oh.us/portals/35/documents/96vol3.pdf***

Ohio EPA. (2008, April). *Ohio Specific Sediment Reference Values.* Retrieved from Ohio EPA Division of Environmental Response and Revitalization Ecological Risk Assessment Guidance Document: ***http://www.epa.ohio.gov/portals/30/rules/rr-031.pdf***

Ohio EPA. (2015, July 31). *Surface Water Field Sampling Manual for Water Quality Parameters and Flows*. Retrieved from ***http://epa.ohio.gov/Portals/35/documents/SW%20Sampling%20Manual%202015%20Update%20Final%20Main.pdf***

Ohio State University. 2018. *Ohio Field Guide to Aquatic Invasive Species.* Ohio Sea Grant.

Persuad, D., Jaagumagi, R., & Hayton, A. (1993, August). *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario.* Retrieved from Ontario Ministry of Environment and Energy: ***https://www.itrcweb.org/contseds-bioavailability/References/guide_aquatic_sed93.pdf***

Reckhow, K. H., & Chapra, S. C. (1983). *Engineering Approaches for Lake Management* (Vol. 1: Data analysis and empirical modeling). Boston, MA: Butterworth Publishers.

Rice, E., Baird, R., & Eaton, A. (2017). *Standard Methods for the Examination of Water and Wastewater* (23 ed.). American Public Health Association; American Water Works Association; Water Environment Federation.

State of Ohio. (2016). *State of Ohio Harmful Algal Bloom Response Strategy for Recreational Waters.* Retrieved from ***http://epa.ohio.gov/portals/35/hab/HABResponseStrategy.pdf***

Wetzel, R. G. (2001). *Limnology: Lake and River Systems* (Third ed.). San Diego, CA: Academic Press.

Appendix O — Fish Tissue Sampling Results

Fish tissue mercury and PCB data from 2016 Raccoon Creek study area sampling (mg/kg).

Year	Site Name	Species	Sample Type	River Mile	Analyte	Value	Detected?
1997	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32	BLUEGILL SUNFISH	Fillet	24.55	Mercury	0.0628	Yes
1997	L. RACCOON CREEK UPST. WELLSTON @ WELSTON PARK RD.	BLUEGILL SUNFISH	Fillet	29.4	Mercury	0.0622	Yes
1997	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32	COMMON CARP	Fillet	24.55	Mercury	0.0425	Yes
1995	L. RACCOON CREEK UPST. MEADOW RUN @ CO. RD. 39	LARGEMOUTH BASS	Fillet	27.9	Mercury	0.0637	Yes
1997	L. RACCOON CREEK UPST. WELLSTON @ WELSTON PARK RD.	LARGEMOUTH BASS	Fillet	29.4	Mercury	0.109	Yes
2016	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	ROCK BASS	Fillet	1.17	Mercury	0.07	Yes
2016	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.	ROCK BASS	Fillet	12.71	Mercury	0.072	Yes
1997	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	SPOTTED BASS	Fillet	1.17	Mercury	0.151	Yes
1997	L. RACCOON CREEK W OF VINTON, ADJ. SHILOH RD.	SPOTTED BASS	Fillet	6.3	Mercury	0.138	Yes
2016	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	SPOTTED BASS	Fillet	1.17	Mercury	0.124	Yes
2016	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	SPOTTED BASS	Fillet	1.17	Mercury	0.229	Yes
2016	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.	SPOTTED BASS	Fillet	12.71	Mercury	0.108	Yes
2016	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.	SPOTTED BASS	Fillet	12.71	Mercury	0.17	Yes
1997	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32	WHITE SUCKER	Fillet	24.55	Mercury	0.0739	Yes
1997	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	YELLOW BULLHEAD	Fillet	1.17	Mercury	0.0585	Yes
1997	L. RACCOON CREEK UPST. WELLSTON @ WELSTON PARK RD.	YELLOW BULLHEAD	Fillet	29.4	Mercury	0.146	Yes
1997	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32	BLUEGILL SUNFISH	Fillet	24.55	total PCBs	0.046	No
1997	L. RACCOON CREEK UPST. WELLSTON @ WELSTON PARK RD.	BLUEGILL SUNFISH	Fillet	29.4	total PCBs	0.048	No
1997	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32	COMMON CARP	Fillet	24.55	total PCBs	0.049	No
1995	L. RACCOON CREEK UPST. MEADOW RUN @ CO. RD. 39	LARGEMOUTH BASS	Fillet	27.9	total PCBs	0.02	No

Year	Site Name	Species	Sample Type	River Mile	Analyte	Value	Detected?
1997	L. RACCOON CREEK UPST. WELLSTON @ WELSTON PARK RD.	LARGEMOUTH BASS	Fillet	29.4	total PCBs	0.05	No
2016	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	ROCK BASS	Fillet	1.17	total PCBs	0.0198	No
2016	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.	ROCK BASS	Fillet	12.71	total PCBs	0.0198	No
1997	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	SPOTTED BASS	Fillet	1.17	total PCBs	0.05	No
1997	L. RACCOON CREEK W OF VINTON, ADJ. SHILOH RD.	SPOTTED BASS	Fillet	6.3	total PCBs	0.05	No
2016	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	SPOTTED BASS	Fillet	1.17	total PCBs	0.0199	No
2016	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	SPOTTED BASS	Fillet	1.17	total PCBs	0.0199	No
2016	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.	SPOTTED BASS	Fillet	12.71	total PCBs	0.02	No
2016	L. RACCOON CREEK UPST. DICKASON RUN @ KEYSTONE RD.	SPOTTED BASS	Fillet	12.71	total PCBs	0.0198	No
1997	L. RACCOON CREEK E OF WELLSTON @ ST. RT. 32	WHITE SUCKER	Fillet	24.55	total PCBs	0.05	No
1997	L. RACCOON CREEK 2 MI SW OF VINTON @ ST. RT. 325	YELLOW BULLHEAD	Fillet	1.17	total PCBs	0.049	No
1997	L. RACCOON CREEK UPST. WELLSTON @ WELSTON PARK RD.	YELLOW BULLHEAD	Fillet	29.4	total PCBs	0.048	No
2009	RACCOON CREEK RESERVOIR, L-1	BROWN BULLHEAD	Fillet	13.05	Mercury	0.097	Yes
1997	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	CHANNEL CATFISH	Fillet	29.2	Mercury	0.0615	Yes
1999	RACCOON CREEK RESERVOIR, L-1	CHANNEL CATFISH	Fillet	13.05	Mercury	0.022	Yes
2009	RACCOON CREEK RESERVOIR, L-1	CHANNEL CATFISH	Fillet	13.05	Mercury	0.01	No
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	CHANNEL CATFISH	Fillet	29.2	Mercury	0.101	Yes
1993	RACCOON CREEK W OF NEWARK @ CHERRY VALLEY RD.	COMMON CARP	Fillet	5.7	Mercury	0.173	Yes
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	COMMON CARP	Fillet	3.08	Mercury	0.107	Yes
2009	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	COMMON CARP	Fillet	3.08	Mercury	0.15	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	COMMON CARP	Fillet	29.2	Mercury	0.048	Yes

Year	Site Name	Species	Sample Type	River Mile	Analyte	Value	Detected?
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	COMMON CARP	Fillet	29.2	Mercury	0.094	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	COMMON CARP	Fillet	29.2	Mercury	0.16	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	COMMON CARP	Fillet	40.01	Mercury	0.161	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	COMMON CARP	Fillet	40.01	Mercury	0.121	Yes
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	CREEK CHUB	Fillet	3.08	Mercury	0.0212	Yes
1997	RACCOON CREEK NEAR MOUTH @ ST. RT. 7	FLATHEAD CATFISH	Fillet	0.39	Mercury	0.0679	Yes
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	FRESHWATER DRUM	Fillet	3.08	Mercury	0.102	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	FRESHWATER DRUM	Fillet	29.2	Mercury	0.155	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	FRESHWATER DRUM	Fillet	29.2	Mercury	0.355	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	FRESHWATER DRUM	Fillet	40.01	Mercury	0.687	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	FRESHWATER DRUM	Fillet	40.01	Mercury	0.152	Yes
1995	RACCOON CREEK NEAR THIVENER @ ST. RT. 218	LARGEMOUTH BASS	Fillet	5.36	Mercury	0.0329	No
1997	RACCOON CREEK NEAR MOUTH @ ST. RT. 7	LARGEMOUTH BASS	Fillet	0.39	Mercury	0.164	Yes
1997	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	LARGEMOUTH BASS	Fillet	29.2	Mercury	0.116	Yes
2009	RACCOON CREEK RESERVOIR, L-1	LARGEMOUTH BASS	Fillet	13.05	Mercury	0.057	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	LARGEMOUTH BASS	Fillet	29.2	Mercury	0.13	Yes
2016	RACCOON CREEK AT VALES MILLS @ ST. RT. 346	ROCK BASS	Fillet	72.22	Mercury	0.15	Yes
2016	RACCOON CREEK AT VALES MILLS @ ST. RT. 346	ROCK BASS	Fillet	72.22	Mercury	0.172	Yes
2016	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.	ROCK BASS	Fillet	89.98	Mercury	0.079	Yes
1995	RACCOON CREEK N OF ADAMSVILLE, 0.7 MILES UPST. U.S. RT. 35	SAUGER	Fillet	29.9	Mercury	0.116	Yes
1993	RACCOON CREEK W OF NEWARK @ CHERRY VALLEY RD.	SMALLMOUTH BASS	Fillet	5.7	Mercury	0.135	Yes

Year	Site Name	Species	Sample Type	River Mile	Analyte	Value	Detected?
1995	RACCOON CREEK AT VINTON @ ST. RT. 160	SPOTTED BASS	Fillet	40.01	Mercury	0.0804	Yes
1997	RACCOON CREEK NEAR MOUTH @ ST. RT. 7	SPOTTED BASS	Fillet	0.39	Mercury	0.0884	Yes
1997	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	SPOTTED BASS	Fillet	29.2	Mercury	0.0588	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	SPOTTED BASS	Fillet	29.2	Mercury	0.431	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	SPOTTED BASS	Fillet	40.01	Mercury	0.193	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	SPOTTED BASS	Fillet	40.01	Mercury	0.539	Yes
2016	RACCOON CREEK S OF CLARION @ ST. RT. 124	SPOTTED BASS	Fillet	55.48	Mercury	0.137	Yes
2016	RACCOON CREEK S OF CLARION @ ST. RT. 124	SPOTTED BASS	Fillet	55.48	Mercury	0.128	Yes
2016	RACCOON CREEK AT VALES MILLS @ ST. RT. 346	SPOTTED BASS	Fillet	72.22	Mercury	0.38	Yes
2016	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.	SPOTTED BASS	Fillet	89.98	Mercury	0.253	Yes
2016	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.	SPOTTED BASS	Fillet	89.98	Mercury	0.099	Yes
1999	RACCOON CREEK RESERVOIR, L-1	WALLEYE	Fillet	13.05	Mercury	0.046	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	WHITE CRAPPIE	Fillet	40.01	Mercury	0.126	Yes
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	WHITE SUCKER	Fillet	3.08	Mercury	0.0796	Yes
1998	RACCOON CREEK N OF CLYDE @ TWP. RD. 223	WHITE SUCKER	Fillet	10.18	Mercury	0.0521	Yes
2009	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	YELLOW BULLHEAD	Fillet	3.08	Mercury	0.03	Yes
1999	RACCOON CREEK RESERVOIR, L-1	YELLOW PERCH	Fillet	13.05	Mercury	0.011	No
2009	RACCOON CREEK RESERVOIR, L-1	BROWN BULLHEAD	Fillet	13.05	total PCBs	0.0493	No
1997	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	CHANNEL CATFISH	Fillet	29.2	total PCBs	0.048	No
1999	RACCOON CREEK RESERVOIR, L-1	CHANNEL CATFISH	Fillet	13.05	total PCBs	0.0493	No
2009	RACCOON CREEK RESERVOIR, L-1	CHANNEL CATFISH	Fillet	13.05	total PCBs	0.0514	No
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	CHANNEL CATFISH	Fillet	29.2	total PCBs	0.0198	No

Year	Site Name	Species	Sample Type	River Mile	Analyte	Value	Detected?
1993	RACCOON CREEK W OF NEWARK @ CHERRY VALLEY RD.	COMMON CARP	Fillet	5.7	total PCBs	0.01972	No
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	COMMON CARP	Fillet	3.08	total PCBs	1.019	Yes
2009	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	COMMON CARP	Fillet	3.08	total PCBs	0.0757	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	COMMON CARP	Fillet	29.2	total PCBs	0.0199	No
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	COMMON CARP	Fillet	29.2	total PCBs	0.0198	No
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	COMMON CARP	Fillet	29.2	total PCBs	0.0198	No
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	COMMON CARP	Fillet	40.01	total PCBs	0.0524	Yes
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	COMMON CARP	Fillet	40.01	total PCBs	0.0477	Yes
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	CREEK CHUB	Fillet	3.08	total PCBs	0.2368	Yes
1997	RACCOON CREEK NEAR MOUTH @ ST. RT. 7	FLATHEAD CATFISH	Fillet	0.39	total PCBs	0.048	No
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	FRESHWATER DRUM	Fillet	3.08	total PCBs	0.184	Yes
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	FRESHWATER DRUM	Fillet	29.2	total PCBs	0.0199	No
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	FRESHWATER DRUM	Fillet	29.2	total PCBs	0.0199	No
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	FRESHWATER DRUM	Fillet	40.01	total PCBs	0.0199	No
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	FRESHWATER DRUM	Fillet	40.01	total PCBs	0.0483	Yes
1995	RACCOON CREEK NEAR THIVENER @ ST. RT. 218	LARGEMOUTH BASS	Fillet	5.36	total PCBs	0.019	No
1997	RACCOON CREEK NEAR MOUTH @ ST. RT. 7	LARGEMOUTH BASS	Fillet	0.39	total PCBs	0.049	No
1997	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	LARGEMOUTH BASS	Fillet	29.2	total PCBs	0.05	No
2009	RACCOON CREEK RESERVOIR, L-1	LARGEMOUTH BASS	Fillet	13.05	total PCBs	0.0498	No
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	LARGEMOUTH BASS	Fillet	29.2	total PCBs	0.0198	No
2016	RACCOON CREEK AT VALES MILLS @ ST. RT. 346	ROCK BASS	Fillet	72.22	total PCBs	0.0199	No

Year	Site Name	Species	Sample Type	River Mile	Analyte	Value	Detected?
2016	RACCOON CREEK AT VALES MILLS @ ST. RT. 346	ROCK BASS	Fillet	72.22	total PCBs	0.0199	No
2016	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.	ROCK BASS	Fillet	89.98	total PCBs	0.02	No
1995	RACCOON CREEK N OF ADAMSVILLE, 0.7 MILES UPST. U.S. RT. 35	SAUGER	Fillet	29.9	total PCBs	0.02	No
1993	RACCOON CREEK W OF NEWARK @ CHERRY VALLEY RD.	SMALLMOUTH BASS	Fillet	5.7	total PCBs	0.0198	No
1995	RACCOON CREEK AT VINTON @ ST. RT. 160	SPOTTED BASS	Fillet	40.01	total PCBs	0.019	No
1997	RACCOON CREEK NEAR MOUTH @ ST. RT. 7	SPOTTED BASS	Fillet	0.39	total PCBs	0.049	No
1997	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	SPOTTED BASS	Fillet	29.2	total PCBs	0.049	No
2016	RACCOON CREEK AT ADAMSVILLE @ U.S. RT. 35	SPOTTED BASS	Fillet	29.2	total PCBs	0.0198	No
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	SPOTTED BASS	Fillet	40.01	total PCBs	0.0199	No
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	SPOTTED BASS	Fillet	40.01	total PCBs	0.0199	No
2016	RACCOON CREEK S OF CLARION @ ST. RT. 124	SPOTTED BASS	Fillet	55.48	total PCBs	0.0199	No
2016	RACCOON CREEK S OF CLARION @ ST. RT. 124	SPOTTED BASS	Fillet	55.48	total PCBs	0.0199	No
2016	RACCOON CREEK AT VALES MILLS @ ST. RT. 346	SPOTTED BASS	Fillet	72.22	total PCBs	0.0199	No
2016	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.	SPOTTED BASS	Fillet	89.98	total PCBs	0.0198	No
2016	RACCOON CREEK UPST. HEWETT FORK @ HOPE-MOONVILLE RD.	SPOTTED BASS	Fillet	89.98	total PCBs	0.0199	No
1999	RACCOON CREEK RESERVOIR, L-1	WALLEYE	Fillet	13.05	total PCBs	0.0475	No
2016	RACCOON CREEK AT VINTON @ ST. RT. 160	WHITE CRAPPIE	Fillet	40.01	total PCBs	0.0199	No
1998	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	WHITE SUCKER	Fillet	3.08	total PCBs	0.1525	Yes
1998	RACCOON CREEK N OF CLYDE @ TWP. RD. 223	WHITE SUCKER	Fillet	10.18	total PCBs	0.146	Yes
2009	RACCOON CREEK NW OF VICKERY @ U.S. RT. 6	YELLOW BULLHEAD	Fillet	3.08	total PCBs	0.2437	Yes
1999	RACCOON CREEK RESERVOIR, L-1	YELLOW PERCH	Fillet	13.05	total PCBs	0.0483	No